
THE PHILIPPINES

IN THE COCOA-CHOCOLATE
GLOBAL VALUE CHAIN

APRIL 2017

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The Philippines in the Cocoa-Chocolate Global Value Chain

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Acronyms

ADM	Archer Daniels Midland
ANECACAO	National Association of Cocoa Exporters (Ecuador)
CIDAMi	Cacao Industry Development Association of Mindanao, Inc.
CocoaPhil	Cocoa Foundation of the Philippines
CONACADO	National Confederation of Dominican Cacao Producers
DA	Department of Agriculture, Philippines
DOST	Department of Science and Technology
DTI	Department of Trade and Industry, Philippines
EU	European Union
FINACO	Association of Producing Countries of Fine Aroma Cocoa (Ecuador)
GAP	Good Agricultural Practices
GVC	Global Value Chain
ICCO	International Cocoa Organization
IFOAM	International Federation of Organic Agriculture Movements
INEN	National Institution of Standards
MAGAP	Ministry of Agriculture, Livestock, Aquaculture and Fisheries (Ecuador)
MIPRO	Ministry of Industry and Productivity
MRECI	Ministry of Foreign Affairs and Human Mobility
NGO	Non-governmental Organization
PCAARRD	Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development
PCAF	Philippine Council for Agriculture and Fisheries
PGI	Protected Geographical Indication
PROECUADOR	Institute for Export and Investment Promotion
PSA	Philippine Statistical Authority (PSA)
SEZ	Special Economic Zone
UK	United Kingdom
UNCTAD	United Nations Commission for Trade and Development
US	United States
USAID	United States Agency for International Development
USDA	United States Department of Agriculture

Executive Summary

This report uses the Duke CGGC Global Value Chain (GVC) framework to examine the role of the Philippines in the global cocoa-chocolate industry and identify opportunities for the country to upgrade. The cocoa-chocolate global value chain (GVC) is a multimillion-dollar industry that connects cocoa bean producers, often located in developing nations, with manufacturers and consumers of chocolate. The demand for chocolate has grown rapidly in the last decade, encouraging countries to expand and improve cocoa bean production. Taking advantage of increased global demand, the Philippines is interested in participating in the sector. The Philippines' current involvement in the cocoa-chocolate GVC is limited despite many competitive advantages. The primary role it plays is an importer of intermediate and final products for domestic consumption. The country has produced cocoa for centuries and has good climatic and geographical conditions for its production. However, exports remain low; globally, the country ranks 72nd in exports with a global market share of less than 0.01% (UNComtrade, 2016). In 2014, only eight Filipino firms reported exports of over US\$500,000 in the cocoa-chocolate GVC (PSA, 2007-2014).

The Cocoa-Chocolate Global Value Chain

As the key ingredient in the production of chocolate, cocoa is one of the world's most highly traded tropical crops, valued at approximately US\$9 billion in 2015 (UNComtrade, 2016). The cocoa-chocolate GVC, for which cocoa beans is a key product, is also growing rapidly. Total trade in the cocoa-chocolate GVC has doubled over the past 10 years, reaching nearly US\$44 billion in 2015 (UNComtrade, 2016). Production is based in hot tropical climates in developing countries, while consumption is primarily concentrated in developed countries in the Northern hemisphere. West Africa is the leading producer, growing approximately two-thirds of the global supply (World Cocoa Foundation, 2014); the majority of this comes from just two countries: Cote D'Ivoire and Ghana, which together supply 61% of global exports (UNComtrade, 2016). Cocoa beans are primarily destined to chocolate manufacturers concentrated in Western Europe, which then export to world markets. Key characteristics of the cocoa-chocolate GVC include:

- **Evolution of global consumption patterns due to rising incomes in the Global South.** As incomes rise in many developing countries, demand for chocolate is also increasing. Brazil, China, India, Russia, and South Africa all are seeing high growth in the demand for chocolate. These emerging economies account for 70% of global confectionary growth in recent years (KPMG, 2014).
- **Stagnation in supply has caused rising prices and concerns of sustainability.** Concurrent with rising demand, global supplies are falling for several reasons. Aging trees and climate change are lowering yields across the globe. This is further complicated by low farm gate price farmers receive for cocoa beans. As a result of these low prices, many farmers have left the industry in favor of higher paying and faster yielding crops.
- **Global supply concerns have led midstream traders and downstream chocolate producers to engage more directly in upstream operations.** These engagements focus primarily on techniques and farm-level interventions to improve the quality and productivity of cocoa production. Many large-scale chocolate manufacturers are working directly with producers to implement best practices and increase harvest while also improving the quality of cocoa beans.

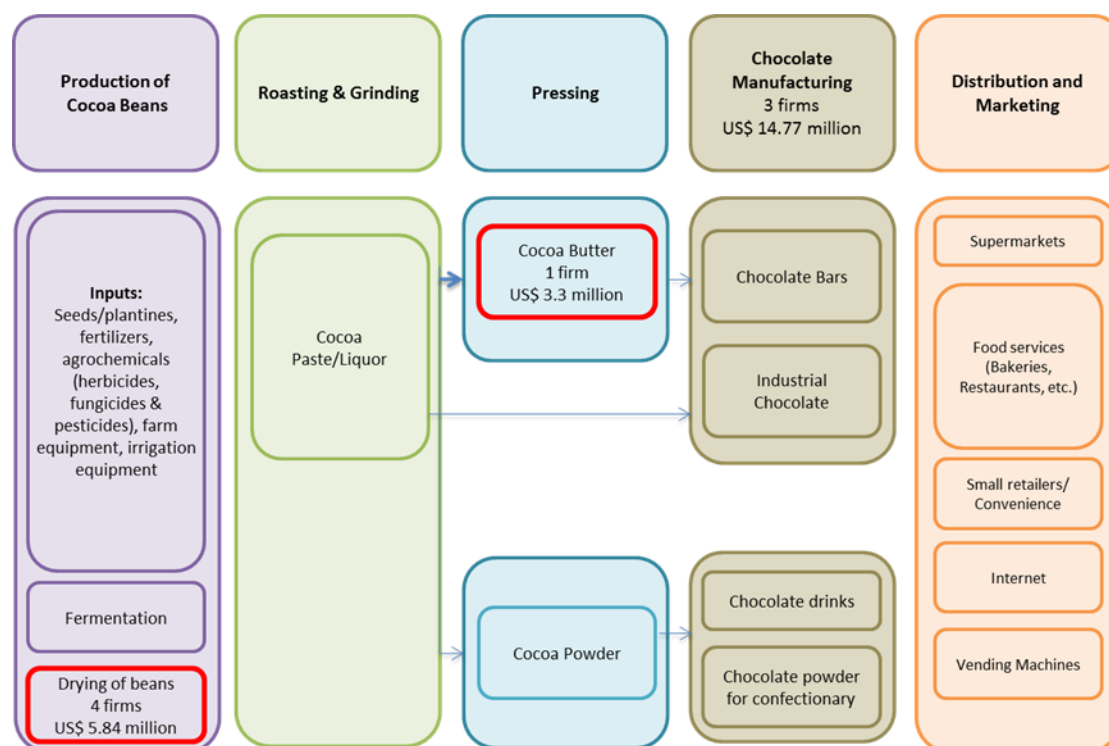
- **Despite low returns on the market currently, many major chocolate manufacturers are shifting to sourcing only certified cocoa beans.** Price premiums associated with certified beans remain low due to supply shortages increasing the price of uncertified beans. However, many global chocolate manufacturers and cocoa processors are committing to sourcing cocoa beans from certified and sustainable sources by 2020. The result is an increasing importance for global certifications such as UTZ and Rainforest Alliance.

The Philippines in the Cocoa-Chocolate Global Value Chain

Growing global demand in the cocoa-chocolate GVC represents an opportunity for the Philippines to expand its presence in the industry. However, the country must first address significant constraints to ensure the industry can support provide for sustainable long-term engagement in the sector. Low volumes of cocoa beans and farm-level issues are the primary challenges to Philippine participation in the chain, constraining upgrading into higher processing stages.

The dwindling supply has reduced the number of large-scale processors. Most businesses are either small-scale chocolate manufacturers or *tablea* makers, with few firms having significant export operations. Current cocoa-chocolate GVC exports totaled US\$24 million in exports in 2015 (UNComtrade, 2016)—the Philippines instead was a net importer with imports exceeding US\$132 million for all products in the cocoa-chocolate GVC. The country's current position in the chain is illustrated in Figure E-1. The segments where the country has more than US\$1 million in exports are shown by red rectangles. In addition, each segment includes the number of firms exporting over US\$500,000. Overall, only eight Filipino firms exceeded that threshold in 2014 (PSA, 2007-2014).

Figure E-1. Philippines Participation in the Cocoa-Chocolate GVC



Source: Authors.

The Philippines' most pronounced strengths in the cocoa-chocolate GVC relate to the geographic conditions that allow for growth of higher value cocoa beans across the nation. It also benefits from a climate that allows for growth of cocoa beans across the nation and a location close to emerging consumer markets. The most prominent advantages include the following:

- **Geographic conditions suitable to growth:** Most of the country has the necessary climate to produce cocoa beans. The majority of production occurs on the island of Mindanao, but the requisite climate for cocoa production can be found throughout the nation. Cocoa also does best when intercropped with other agriculture products, such as coconuts and bananas, which are also produced in the nation.
- **Ability to grow multiple varieties of cocoa beans:** In addition to a large part of the nation being suitable for cocoa bean cultivation, the Philippines can grow many varieties of cocoa. Trinitario remains the main variety cultivated given the high value and resiliency of the bean. However, Forastero and Criollo beans are also produced in country.
- **Proximity to growing demand markets:** Rising incomes in Asia results in increased consumption of chocolate as consumers shift towards more Western lifestyles. The Philippines' is close to many of these markets. China for example, offers an opportunity for the Philippines to leverage its geographic location to help spur exports.

In order to capitalize on these advantages, additional effort is needed to address constraints at the farm-level as well as broader issues of coordination across the industry. Farming techniques and aging trees both have negative impacts on productivity. Furthermore, underdeveloped post-harvest practices impede export potential and the ability to achieve economies of scale. Finally, the industry needs to work towards closer collaboration to improve coordination and increase competitiveness.

- **Lack of adoption of modern agricultural practices:** Farmers in the country often rely on traditional farming practices, resulting in lower yields. Despite training programs, adoption of modern agricultural practices in cocoa is limited. This is compounded by an aging farmer population and incomplete land reform that has left many without titles to their land, a prerequisite to secure loans to invest in farm upgrades.
- **Fragmented production:** Smallholders primarily undertake production of cocoa beans, and coordination among these actors is limited. While some cooperatives and farmer associations exist to help aggregate, supply and reduce transaction costs, the high domestic price for beans encourages side-selling by farmers and poses a significant challenge to reaching economies of scale.
- **Underdeveloped post-harvest techniques.** Fermentation and drying of cocoa beans is necessary to secure high selling prices. However, implementation of modern technologies and techniques remains limited, even with cocoa revitalization efforts.
- **Lack of coordination among stakeholders.** The nation has launched several programs to help revitalize the industry and capitalize on growing demand for chocolate. However, these programs often are not coordinated across the industry, which creates inefficiencies and duplication along the value chain.

Upgrading in the industry in other countries has been heavily influenced by government policy and support, including tax incentives, training programs and a national strategy for growth. Countries that have upgraded in the industry have followed a similar approach—beginning with increasing production before developing specialized varieties or entering into processing on a large scale. A similar strategy is proposed for the Philippines. Table E-I details the upgrading trajectories identified for the Philippines to expand and upgrade its position within the cocoa-chocolate GVC.

Table E-I. The Philippines and the Cocoa-Chocolate GVC: Upgrading Trajectories

Time Frame	Upgrading Trajectory	Key Benefits	Philippines Challenges
Short Term	Process Upgrading: Increase domestic production of cocoa beans for export and local processing	<ul style="list-style-type: none"> Expand volume of cocoa exports Increase backward linkages and local value add in downstream production Employment and revenue creation for smallholders Compliments existing production in coconut and banana (<i>intercropping</i>) 	<ul style="list-style-type: none"> Fragmented system of production—mainly smallholders Slow uptake of GAPs among farmers, including poor use of fertilizer and irrigation Weak access to capital for smallholders Ageing farmer population Aging trees
Short- Medium Term	Process Upgrading: Certification of production	<ul style="list-style-type: none"> Provides long term access to cocoa market which has increased its focus on sustainability and certifications 	<ul style="list-style-type: none"> Lack of access to finance by smallholders Few certification agencies in the country
Short – Medium Term	Product Upgrading: Diversify the varieties of cocoa beans produced in country	<ul style="list-style-type: none"> Minimize exposure to global price volatility and harvest issues Higher returns for Fine Flavor certified products 	<ul style="list-style-type: none"> Reluctance to rejuvenate cocoa trees Some varieties are more susceptible to disease and weather damage than others Lack of human capital with relevant qualifications and experience
Medium-Long Term	Functional Upgrading: Move into semi-processed segments of chain on a large scale (Roasting & Grinding)	<ul style="list-style-type: none"> Higher unit value from cocoa paste/liquor Strategic location to serve growing markets for chocolate in China and India Semi-skilled and skilled employment generation 	<ul style="list-style-type: none"> Lack of necessary cocoa bean supply Infrastructure and logistic costs Energy cost Human capital for managing machinery Regional competition from Indonesia and Malaysia

I. Introduction

The cocoa-chocolate global value chain (GVC)¹ is a multi-million dollar industry that connects cocoa bean producers in developing countries with manufacturers and consumers of chocolate who are most typically in developed nations. The demand for chocolate has grown rapidly in the last decade, encouraging countries to expand and improve cocoa bean production. Seeing opportunity in these trends as well as recognizing climatic advantages, the Philippines' government is increasing its presence in the sector. The country has produced cocoa for centuries; however, exports remain low. The country ranks 72nd in exports with a global market share of less than 0.01% (UNComtrade, 2016). In 2014, only eight Filipino firms participated in the cocoa-chocolate GVC (PSA, 2007-2014). Instead, the country is an importer of intermediate and final products for domestic consumption.

Expanding production of cocoa beans and farm-level issues are the primary challenges to the Philippines' participation in the cocoa-chocolate value chain, constraining upgrading into higher processing stages. Production of cocoa beans is limited due to low quality seedlings, inefficient farm-level processing techniques and limited access to capital and training for farmers. An aging farmer population and younger generations seeking employment outside the agriculture sector further constrain production. These issues undermine the supply of cost-competitive raw cocoa beans for the manufacturing segments. Cocoa bean yields are well below the global average and there are not enough domestic beans to justify either grinding for export markets or even for the domestic market. As a result, grinding capacity is limited in the Philippines, and the number of large scale grinding firms is shrinking.

Drawing on analysis of the global industry, it can be seen that developing countries with high participation in the GVC such as Cote D'Ivoire, Ghana and Indonesia have focused on establishing a solid and stable supply of cocoa beans before moving to the manufacturing stages of the chain. Using a multi-stakeholder approach, these countries have been able to upgrade their operations to become exporters of intermediary products such as cocoa liquor/paste and cocoa butter as well as cocoa beans. As they expand domestic processing, the global supply of cocoa beans for downstream processing countries will likely decline. A central lesson these countries offer the Philippines is that entry and upgrading in the sector initially should focus on increasing and expanding cocoa bean production. Once this goal is achieved, upgrading into the manufacturing stages of the chain can be pursued. This work will require coordination among all the actors in the value chain—from actors in the agricultural stages of the chain to actors in manufacturing segments.

This paper uses the global value chain (GVC) framework to understand how the global cocoa-chocolate industry is changing, assess the Philippines current position in the GVC, and identify opportunities to upgrade with the goal of promoting economic development, particularly in rural areas. It first provides an overview of the cocoa-chocolate value chain to present a clear understanding of the scope of the industry, how markets are structured and how changing distribution of demand and supply can alter structural dynamics. It then analyzes the Philippines' current position, examining both the advantages and the challenges for domestic industry development. After providing comparative case studies on Ecuador and Indonesia's experiences in

¹ As this agribusiness value chain follows the industry from the production of cacao through the confection of chocolate, the term cocoa-chocolate has been used; other variations used in the literature include the cacao sector, and the cocoa global value chain.

the cocoa-chocolate GVC, it concludes by outlining potential upgrading strategies. Policy recommendations to enable those upgrading trajectories conclude the paper.

2. The Cocoa-Chocolate Global Value Chain

2.1 The Global Cocoa-Chocolate Industry: An Introduction

As the key ingredient in the production of chocolate, cocoa beans is one of the world's most highly traded tropical crops, valued at approximately US\$9 billion in 2015 (UNComtrade, 2016). Total trade in the cocoa-chocolate GVC has doubled over the past 10 years reaching nearly US\$44 billion in 2015 (UNComtrade, 2016).² Production is based in hot tropical climates in developing countries, while consumption has been primarily in developed countries in the Northern hemisphere. West Africa dominates production, growing approximately two thirds of global supply (World Cocoa Foundation, 2014); the majority of this comes from just two countries, Côte d'Ivoire and Ghana, which together supply 61% of global exports (UNComtrade, 2016). This cocoa is destined mainly to chocolate manufacturers concentrated in Western Europe, which in turn, export to the world.

Several changes in recent years have begun to reshape the global cocoa industry with important implications for countries seeking to expand their presence in the sector: First, global consumption patterns have changed as a result of rising disposable income in emerging economies driving demand for chocolate products. Brazil, China, India, Russia, and South Africa. These emerging economies account for 70% of global confectionary growth (KPMG, 2014). China, in particular, is a major driver of this growth as incomes rise, the market liberalizes and consumers begin to adopt more Western dietary habits and lifestyles (Ferdman, 2014; Squicciarini & Swinnen, 2016). Chinese imports of chocolate grew around 700% from 2005 to 2015, from nearly US\$64 million to almost US\$516 million. Brazil has followed a similar pattern, increasing imports tenfold over the past decade. ³ Expansion of cold chain capabilities in these southern markets has also helped to drive demand (Barrientos, 2015). These new players have joined mature markets in the European Union (EU), Japan and the United States (US) (International Cocoa Organization, 2014) to boost the size of the global chocolate market to approximately US\$98 billion (Euromonitor, 2016b; Hawkins & Chen, 2014). This has also opened up numerous new South-to-South market opportunities for cocoa-producing countries.

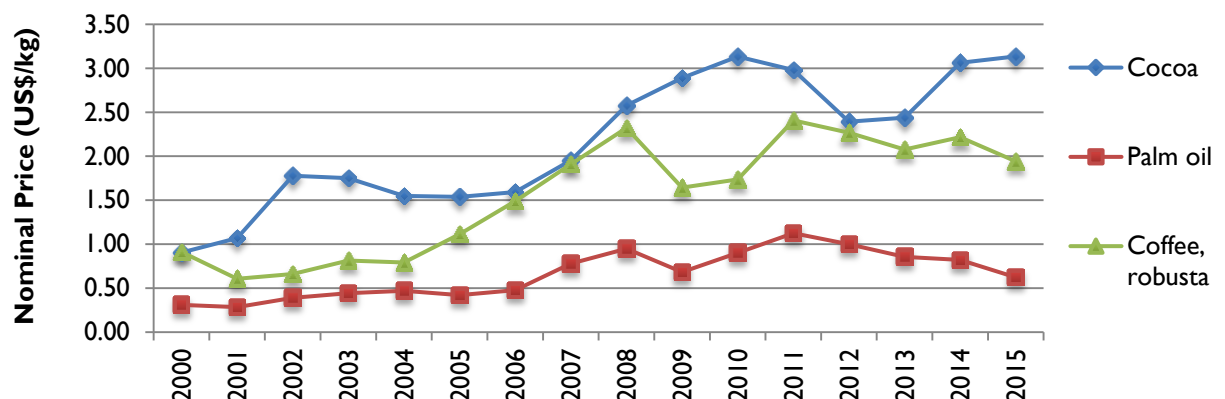
Second, the significant increase in demand occurred at the same time as stagnation in the supply of cocoa beans, resulting in a global shortage; this has led to an important rise in global prices and concerns about the sustainable supply of raw materials. Weak farm gate returns from cocoa—the average income from cocoa production was estimated to be approximately US\$0.42/capita/day in Ghana in 2008 (Barrientos & Asenso-Okyere, 2008)—have driven farmers to move to better and faster paying crops, or out of agriculture completely. Aging trees, adverse weather conditions and disease have accentuated this shift, and production has become unsustainable for many producers (Barrientos, 2014; UNCTAD, 2016; Williams & Eber, 2012). Global export volumes reflect these challenges and have remained relatively unchanged over the past decade; in 2005, exports were 2.8 million tons, compared to 2.7 million tons in 2015 (UNComtrade, 2016). The simultaneous increase in demand has resulted in a steady rise in the price of cocoa, even compared to other food

² Sector-wide exports have doubled over the past 10 years, with a peak almost US\$48 billion in 2014 (UNComtrade, 2016).

³ Brazil imported US\$27.5 million in 2005, while in 2015 increased to nearly US\$171 million (UNComtrade, 2016).

commodities over the past two decades. Nominal prices more than tripled; in 2000, cocoa was traded at US\$0.91/kg, while in 2015 it reached US\$3.14/kg. During that same period, by comparison, palm oil and Robusta coffee prices only doubled (see Figure 1). With future demand expected to increase by more than 4.5 million tons by 2020, experts predict a global shortage of cocoa supply, that could be as high as 1 million tons by 2020, and 2 million tons by 2030 (Fairtrade Foundation, 2016; Ferdman, 2014). This offers potential prospects for new producing regions, should they be able to manage constraints to sustainable production.

Figure 1. Cocoa, Palm Oil and Coffee Annual Prices, Nominal US dollars, 2000-2015



Source: World Bank Commodity Price Data, Updated Nov. 02, 2016.

Third, concerns over global supply of chocolate have led midstream traders and downstream chocolate producers to engage more directly in upstream operations to improve the quality and productivity of cocoa production (Barrientos, 2015; Fairtrade Foundation, 2016; Lamb, 2014). The chocolate sector has traditionally had little interaction with growers, who interacted with the market mainly through traders or national marketing boards (Barrientos, 2015).⁴ This has begun to change. At the cocoa production level, company schemes and commitments towards sustainable production include Plan Ferrero's commitment to sustainable cocoa, Mars' Sustainable Cocoa Initiative, Mondelez's Cocoa Life (see Box 1) and Nestlé's Cocoa Plan (Barrientos, 2015; Fairtrade Foundation, 2016). Together these initiatives are focused on a) developing more disease-resistant and productive hybrids, b) improved and innovative techniques for fermentation and drying, c) enabling more efficient and varied farm growing plans and business models, d) paying higher wages and providing better quality of life for farmers (Williams & Eber, 2012). Meanwhile, mid-stream companies have been investing directly in processing facilities to ensure consistent supplies of cocoa intermediates, including cocoa paste, liquor and butter, from a wider range of bean quality, allowing firms to maximize on the limited supply of beans. For instance, in Cote d'Ivoire, foreign-owned companies, including Barry Callebaut, Cargill and Olam, are investing heavily in processing facilities (Fairtrade Foundation, 2016). New producers thus have an opportunity to immediately engage with

⁴ From the 1950s to 1980s, the predominant model of support for cocoa farmers was through state dominated export-marketing boards, which set farmer prices, had monopoly control over cocoa purchases and exports. The international cocoa market was then largely characterized by arms-length trading through commodity markets (Barrientos, 2015).

downstream actors; this provides a unique possibility to develop the necessary skills to be successful in the sector.

Box 1. Mondelez Cocoa Life Program to Boost Productivity

In 2012, ten of the leading cocoa processors and chocolate brand manufacturers (developed country firms) agreed on sharing good agricultural practices (GAP) and crop yield to meet growing demand and address declining productivity. Mondelez International,⁵ the world's largest chocolate manufacturer, is one of the leaders of this initiative through its program, Cocoa Life. Through Cocoa Life, Mondelez has committed US\$400 million to cocoa sustainability programs in six nations: Ghana, Cote d'Ivoire, Indonesia, the Dominican Republic, India, and Brazil; the goal is to work with as many as 200,000 cocoa farmers by 2022.

The program seeks to promote sustainable, high yield production among farmers to help increase farm revenue. In addition to teaching farmers GAPs, it focuses on developing business skills of the farming communities, helping to shift the perception of farming as a subsistence activity to a commercially, viable operation, making the profession more attractive to younger generations. The design and themes of programs are created in consultation with multiple stakeholders in the community. Finally, third parties frequently evaluate initiatives linked to Cocoa Life to gauge effectiveness and impact.

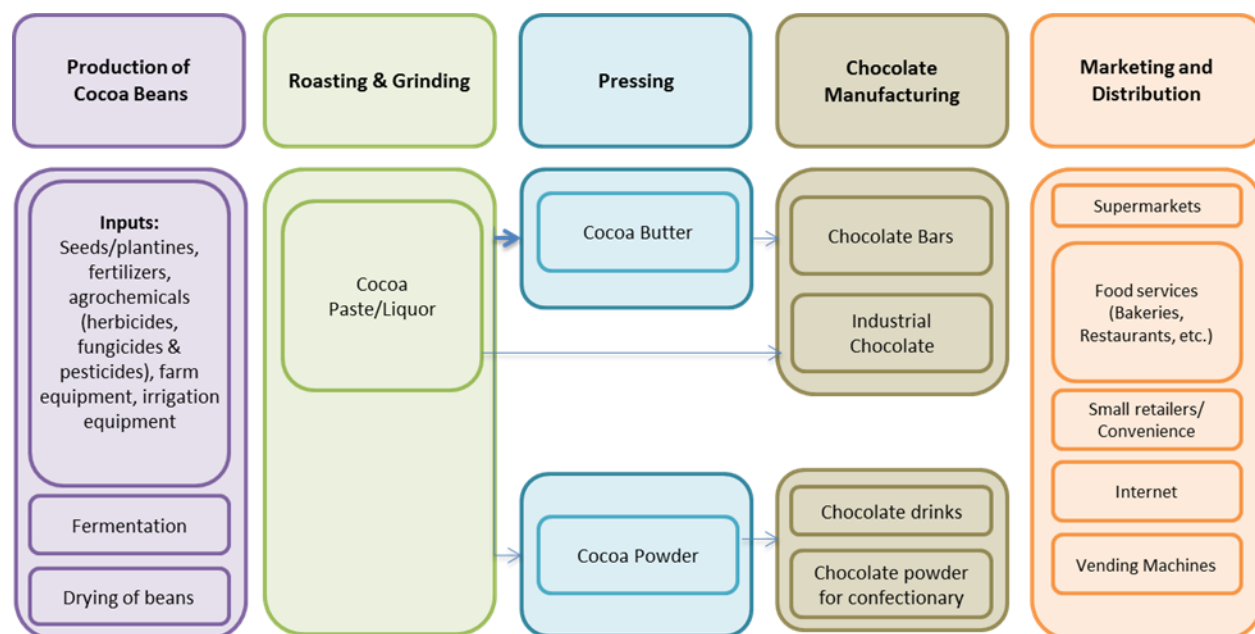
By 2015, as a result of Cocoa Life, Mondelez International was working with 76,700 cocoa farmers in Ghana, Cote d'Ivoire, Indonesia and India and sourced 21% of its cocoa beans from sustainable farms.

Source: Mondelez International (2016).

2.2 Mapping the Cocoa-Chocolate Global Value Chain

The cocoa-chocolate GVC spans both agricultural and manufacturing activities; it covers the agricultural stages of cocoa bean production, mid-stream manufacturing processing of cocoa beans into intermediate products as well as the production, marketing and distribution of chocolate and other final products. These processes can be divided into five main segments: 1) Production of Cocoa Beans 2) Roasting and Grinding, 3) Pressing, 4) Chocolate Manufacturing, and 5) Marketing and Distribution. Figure 2 provides an illustration of this value chain. While each stage is highly focused on one or two processes, volume, energy, shipping conditions, and other input requirements have resulted in this considerable fragmentation of the chain.

⁵ Mondelez International owns the following chocolate brands: Cadbury, Milka, Lacta, Côte d'Or and Alpen Gold (see Section 2.4).

Figure 2. Cocoa-Chocolate Global Value Chain


Source: Authors.

Production of Cocoa Beans: Cocoa production is a perennial crop; after planting, trees mature within approximately three to five years depending on the variety and have a productive life of 25-30 years, producing beans approximately every six months (ICCO, 2014; UNCTAD, 2016).⁶ Cocoa beans vary by quality, with three major categories of beans (see Box 2). Growing techniques such as shade-plantation and fertilization can have important impact on the productivity of raw mature cocoa beans. Production is labor-intensive during harvest which is done by hand, and trees require close monitoring during the rest of the year – particularly for fertilization needs, disease and animal interference (UNCTAD, 2016; World Cocoa Foundation, 2016). Following harvest, the pulp-covered beans must be fermented and dried. Fermentation entails heating the beans for up to a week. This is a key process with considerable bearing on the quality of downstream products as it produces the chocolate flavor. Afterwards, the wet cocoa beans are typically dried in sunlight for five to ten days, which helps to improve their shelf life. This drying process can also be done in mechanical dryers (UNCTAD, 2016; World Cocoa Foundation, 2016).

Labor intensity combined with the industrial organization structure of producing-countries within the Tropics has favored production by primarily smallholders. These farmers, which cultivate between 1 and 4ha of land, account for between 80 and 90% of global production (UNCTAD, 2016). Growers typically undertake fermentation and drying activities, although this may also be carried out collectively by cooperatives or at a collection center owned by traders/processors. The output of this stage is dried cocoa beans. In addition to farm level activities, production is supported by a wide array of research and development activities geared particularly to studying new varieties of cocoa beans as well as optimal growing cycles and processes.

⁶ The harvesting cycles depend on the climate and the variety of cocoa and thus may differ slightly by location and type.

Box 2. Cocoa Bean Varieties

Cocoa beans, the seeds of the *Theobroma cacao* tree, can be classified into three groups: Criollo, Trinitario and Forastero. Criollo and Trinitario are referred to as fine or flavor beans and used for higher value chocolate production while Forastero beans are referred to as ordinary or bulk beans used for mass production.

- Criollo beans are rare, and account for only 5% of global production. Trees are native to Central and South America, as well as the Caribbean and Sri Lanka. Criollo trees are known to be very fragile to environmental disturbances but yield the highest value beans in the market.
- Forastero beans are often compared to the Robusta coffee bean and are used in mass production. Plantings are widespread, especially in Africa, Ecuador and Brazil. Globally, Forastero beans account for 80% of all global cocoa bean production but have the lowest market value.
- Trinitario beans are hybrids of Criollo and Forastero beans. These are high enough quality to be considered fine or flavored but are more resilient to harsh climate and disease compared to Criollo. The variety accounts for 15% of global production and is found in Mexico, South America and Southeast Asia.

An additional distinction, fine or flavor cocoa (FFC) is also prominent in the international market. FFC beans are typically Criollo or Trinitario varieties, but can also be Forastero varieties, such as in the case of Ecuador. FFC is recognized for its high-quality taste profile and commands higher prices. ICCO, the agency that regulates and denotes beans as FFC, only uses this distinction for export cocoa beans.

Sources: Barry Callebaut (2016d); The Chocolate Revolution (2016) (ICCO, 2017a).

Roasting and Grinding to Produce Cocoa Liquor or Paste: This mid-stream activity is the first agri-processing stage of the value chain and is focused on enhancing the aromas, flavors and color of the beans. Dried beans are inspected and cleaned; roasted to reduce water content and then undergo alkalization after the shells are removed (ICCO, 2016c). Specialty grinders are used to mill the roasted nibs to create cocoa liquid/liquor or paste. These capital-intensive activities are primarily undertaken by large, multinational processors or ‘grinders’ (Barrientos, 2015), with a growing share of grinding taking place at the origin of cocoa bean production (referred to as ‘origin grindings’). Roasting and grinding requires investment in equipment and is high in energy consumption (VDMA, 2009).

Pressing to Produce Cocoa Butter and Cocoa Powder: During this stages, the cocoa liquor/paste is fed into hydraulic presses at high temperature that separates the liquor/paste into two components: cocoa butter and cocoa cake, a solid mass that is later pulverized to form cocoa powder (Barry Callebaut, 2016c; World Cocoa Foundation, 2016). In the process, two outputs are generated: cocoa butter and cocoa powder. Large multinational processors dominate the production of cocoa butter and powder. In some cases, these operations are co-located with roasting and grinding operations, although these can be geographically separated. The pressing stage requires special and expensive equipment that consumes high levels of energy since it needs to heat and agitate the cocoa liquor. Many of these machines require specialized technicians to operate them (Duyvis Wiener, 2017).⁷

⁷ Well-known cocoa press equipment manufacturers are: Duyvis (the Netherlands), Carle & Montanari (Italy), Vitali, (Italy), Nagma/Heidenau (Germany) and Bauermeister (Germany) (Cocoa & Chocolate Online, 2016).

Chocolate Manufacturing: This stage of the chain primarily involves the production of chocolate, and to a lesser degree cocoa powder preparations. Depending on the type of chocolate manufactured (Barry Callebaut, 2016c), a mixture of cocoa butter, cocoa liquor, sugar, milk and other ingredients are heated and blended,⁸ removing volatile flavors, reducing viscosity and particle size (Cadbury, 2016a; World Cocoa Foundation, 2016). After this, the mixture is tempered – that is, heated, cooled and reheated, before being molded into chocolate bars and cooled and packaged. In the case of cocoa powder preparation, cocoa powder is mixed with sugar and other additives. Chocolate production includes products destined directly for consumption, such as chocolate bars, as well as inputs for the production of confectionary items, such as biscuits, cakes, and ice cream, amongst others. Chocolate bar manufacturing tends to be dominated by major brands, with private-label retail chocolate taking up a minor share, whereas ‘industrial chocolate’ destined for the production of other final products is manufactured by both brands – many of which are owned by multinational food and beverage companies and thus vertically integrated into the production of final products, and mid-stream cocoa processors,⁹ as well as other specialty chocolate providers which supply what is referred to as the ‘open market’ (Euromonitor, 2012; Webber, 2009).

Marketing and Distribution: Once the chocolate and cocoa powder are packaged they are distributed to different channels for their sale and consumption, including supermarkets, convenience stores, specialty retailers, vending machines, and artisanal confectionary producers (e.g. bakers, pastry chefs, hotels, restaurants and caterers). Supermarkets dominate sales in most major markets. Overall, as a large share of chocolate consumption is based on impulse purchases, gifts and special occasions such as Easter and Christmas, producers use as wide a range of purchasing points as possible to increase potential consumption (Euromonitor, 2012; Webber, 2009).

2.3 Global Trade in the Cocoa-Chocolate Global Value Chain

This section analyzes global trade in the cocoa-chocolate GVC. A large number of both developed and developing countries participate in the cocoa-chocolate GVC. On the supply side, developing countries located along the equator are the major exporters of cocoa beans that are later processed into intermediate products in other locations around the world. Final products, like chocolates and other confectionary items are mainly produced and exported by the EU and North America. Overall, the Netherlands plays a key role in the value chain, importing cocoa beans, processing intermediate products and producing final products. While the demand for chocolates is still concentrated in developed countries located in Europe and North America, this is beginning to shift towards developing markets, in particular, Asia.

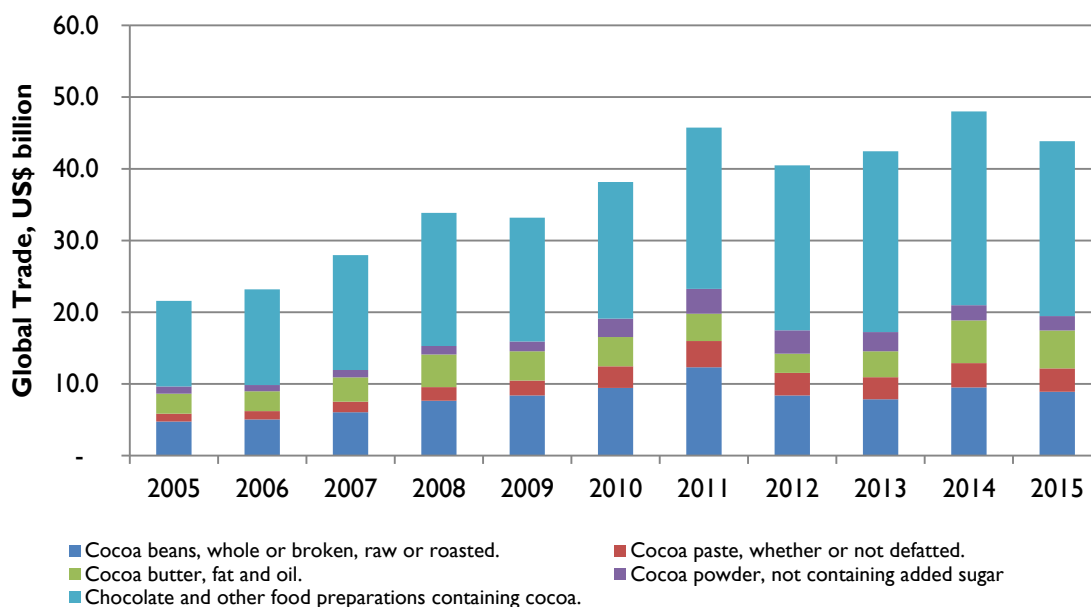
This is a growing, global industry: total trade in the cocoa-chocolate GVC has doubled over the past 10 years reaching nearly US\$44 billion in 2015 (UNComtrade, 2016).¹⁰ In terms of value, chocolate exports capture 56% of the total exports in the industry, followed by cocoa beans 20%, cocoa butter 12%, cocoa liquor/paste 7% and cocoa powder 5%. Figure 3 highlights the distribution of exports by value in different segments of the value chain over the past decade.

⁸ This requires specialized blenders known as conches in the industry.

⁹ Under the popular global business brands, for instance, Barry Callebaut (Cacao Barry and other six brands), Cargill (Gerken Cacao), and ADM (deZaan), cocoa processors supply industrial chocolate, as well as cocoa powder, to business customers such as specialty manufacturers, and artisanal producers, including bakers, pastry chefs, hotels, restaurants and caterers (Euromonitor, 2012).

¹⁰ Sector-wide exports peaked at almost US\$48 billion in 2014 (UNComtrade, 2016).

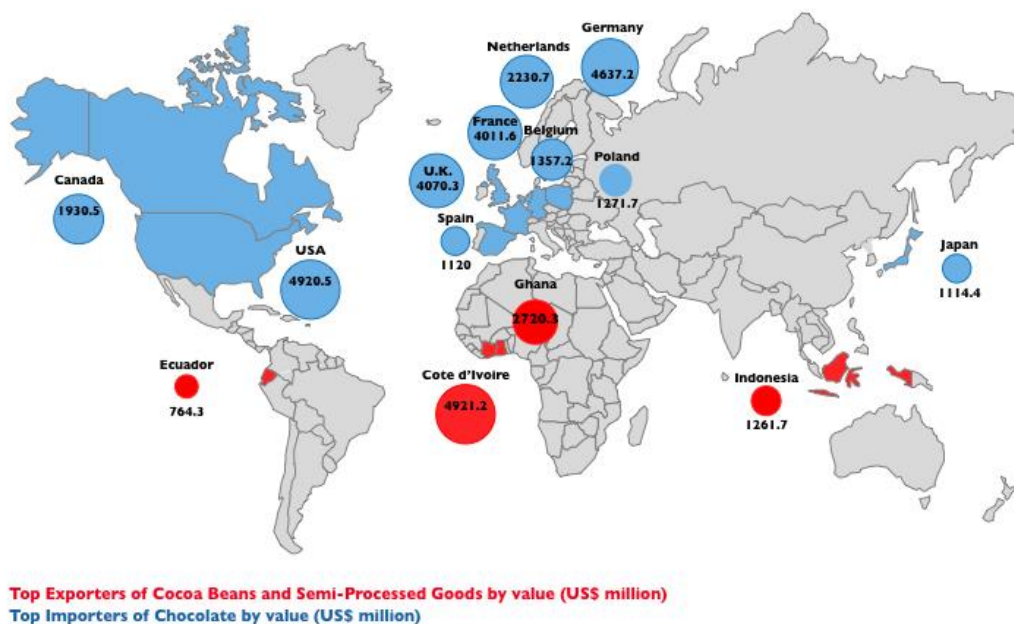
Figure 3. Cocoa-Chocolate Trade Value by GVC Segment, 2005-2015



Source: UN Comtrade, HS2002- 1801,1803,1804,1805,1806; downloaded 10/25/2016

Overall, a handful of developing countries dominate exports in the early stages of the value chain, while developed countries primarily participate in the final product stages of the chain (see Figure 4).

Figure 4. Cocoa Chocolate Value Chain Input-Output Traders

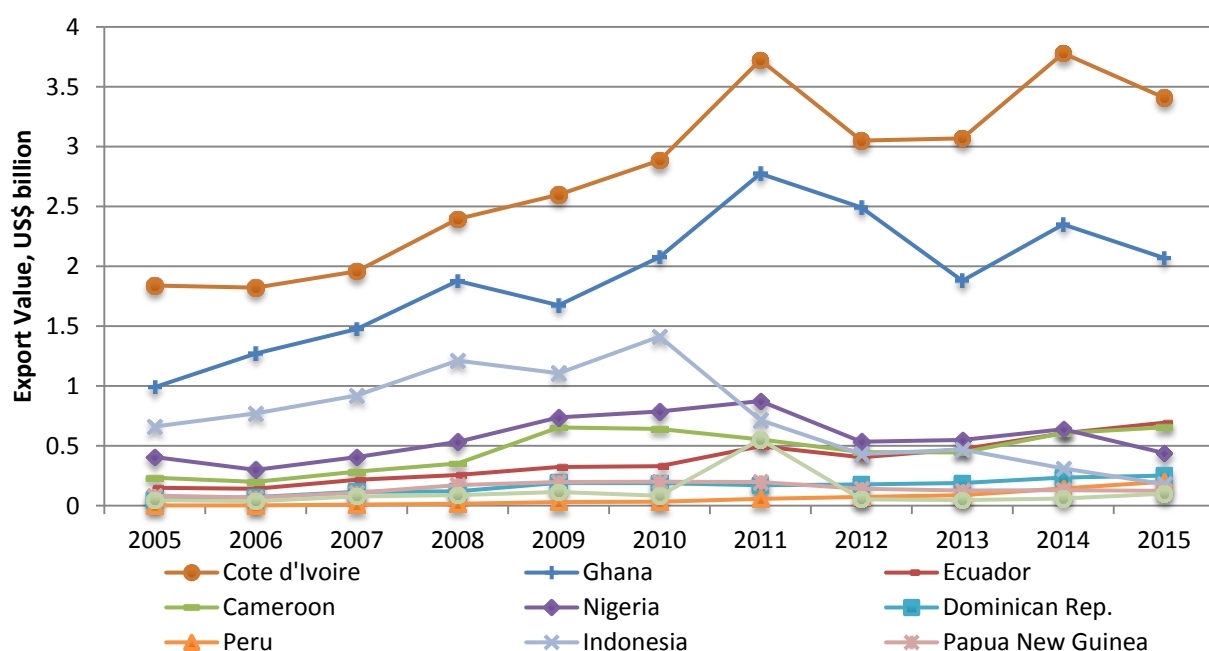


Source: Authors based on UN Comtrade, HS2002- 1801,1803,1804,1806; downloaded 10/25/2016.

Production of cocoa beans is almost exclusively the domain of developing countries.

Production is centered in the Equatorial belt nations. Two regions drive global exports: Africa and South America, with a small presence of Asian countries. Cote D'Ivoire is the leading exporter of cocoa beans, followed by Ghana. In 2015, Cote D'Ivoire supplied approximately US\$3 billion, while Ghana exported US\$2 billion worth of cocoa beans (see Figure 5) (UNComtrade, 2016); together, concentrating 61% of the total world exports. South American production by comparison is much smaller; but the region's focus is on fine cocoa, supplying 80% of this higher value variety (Amores et al., 2007). Leading exporters are Ecuador,¹¹ Dominican Republic and Peru. Indonesia is the most prominent Asian producer, with more than 1.5 million Ha of cocoa plantations. The country launched a revitalization program in 2009 to boost production. Since 2010 cocoa beans exports have declined and the export of processed cacao products such as cocoa liquor and cacao butter began increasing (Indonesia Investments, 2017); in part due to a 2010 export tax on raw cacao beans to incentivize the processing stages.

Figure 5. Top Ten Cocoa Bean Exporters by Value (US\$, billion), 2005-2015



Source: UN Comtrade, HS2002- 1801, downloaded 10/25/2016

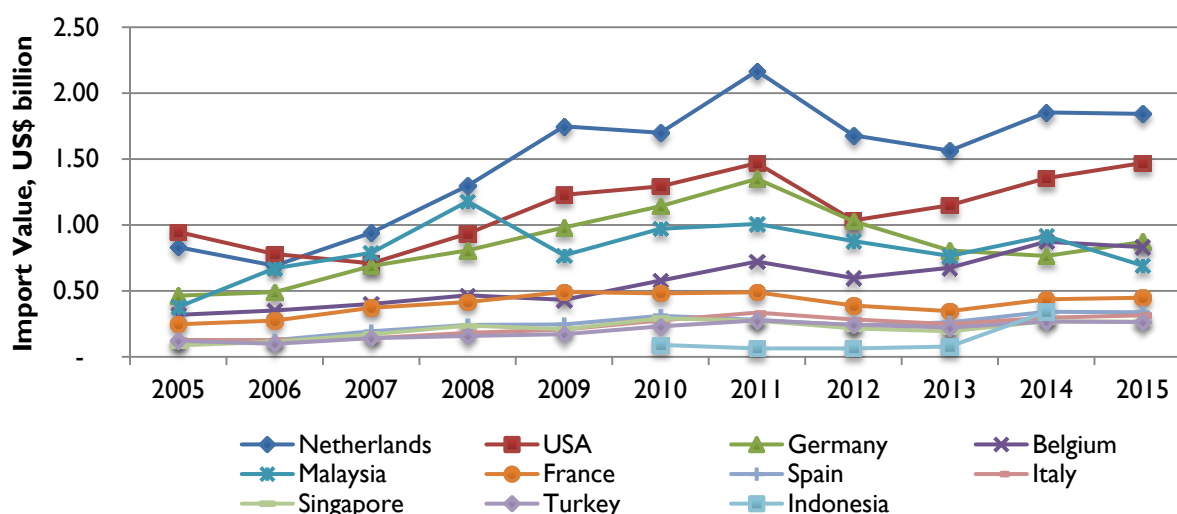
Traded cocoa beans are destined primarily to developed countries. Demand for cocoa beans to produce chocolate bars and other products that contain chocolate is concentrated in Europe and the US. The top 10 importers represent 82% of the market; although the leading three importers, the US, the Netherlands and Germany, alone accounted for approximately half (47%) of imports in 2015. The Netherlands serves both as a leading manufacturing destination, as well as an entry point for cocoa beans destined to Germany (see Figure 6).¹² Malaysia is the only Southern market in the top five. Host to a number of chocolate global brands, Malaysia aims to be the leader

¹¹ Ecuador is the biggest supplier of fine cocoa in the world.

¹² In 2015, approximately 23% of cocoa beans imported into the Netherlands were re-exported on to Germany.

of chocolate production in the Asian region by 2020.¹³ The country is also encouraging the production of cocoa in the country providing inputs and training to small farmers (Malaymail Online, 2014). While the country's value of imports has remained constant over the past ten years, it has seen a significant decline in the volumes imported as prices have risen. Between 2006-2008, import volumes were approximately 454 million tons, but by 2015, this had fallen to just half of that (UNComtrade, 2016).

Figure 6. Top Ten Cocoa Bean Importers, by Value (US\$ billion), 2005-2015

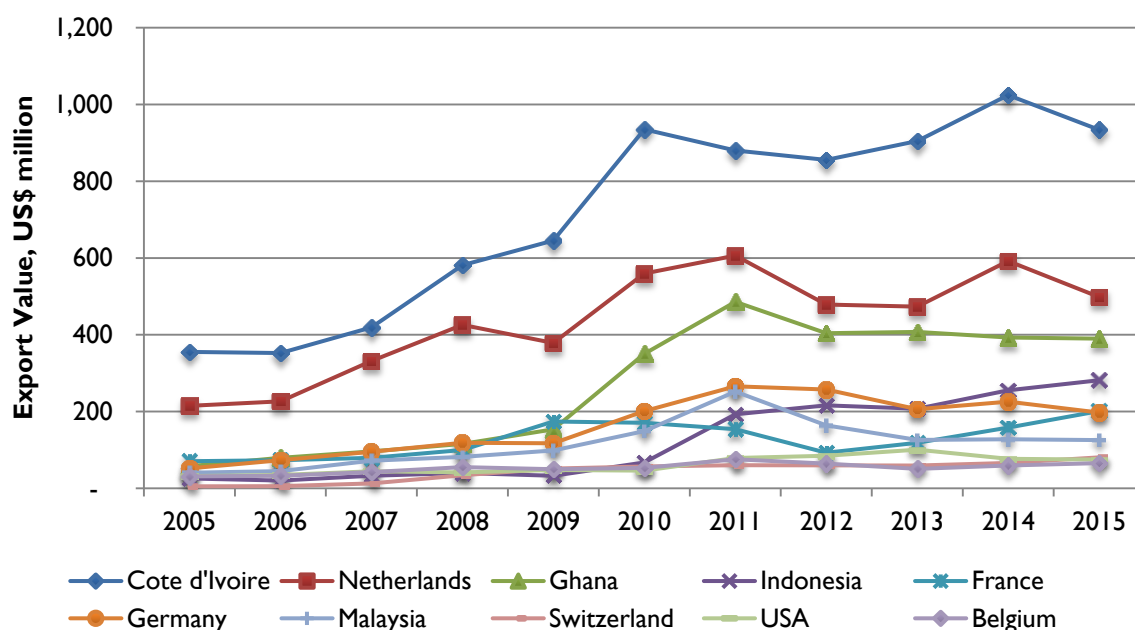


Source: UN Comtrade, HS2002- 1801; downloaded 10/25/2016

Producing (developing) countries, nonetheless, have begun to undertake a greater share of early processing, particularly in the production of cocoa paste, this is known as 'origin grinding'. As the largest global producers of cocoa beans, Cote D'Ivoire and Ghana have focused on shifting into higher value stages of the chain to add value to their primary export commodity. Cote D'Ivoire increased paste exports from US\$355 million in 2005 to over US\$1 billion in 2014, while Ghana has also increased significantly from US\$57 million to US\$390 million in the same period. Indonesia has also emerged as a leading exporter of early intermediates, surpassing Germany in 2013 to become the fourth largest exporter globally. The country has steadily decreased its exports of unprocessed beans as it increased its processing capacity (see Figure 7). These three developing countries compete primarily with the Netherlands. As these major producing countries seek to add value to their beans through processing, the supply of unprocessed beans on the global market could begin to decline. This poses a challenge for non-producing countries seeking to enter the industry in downstream processing stages of the chain.

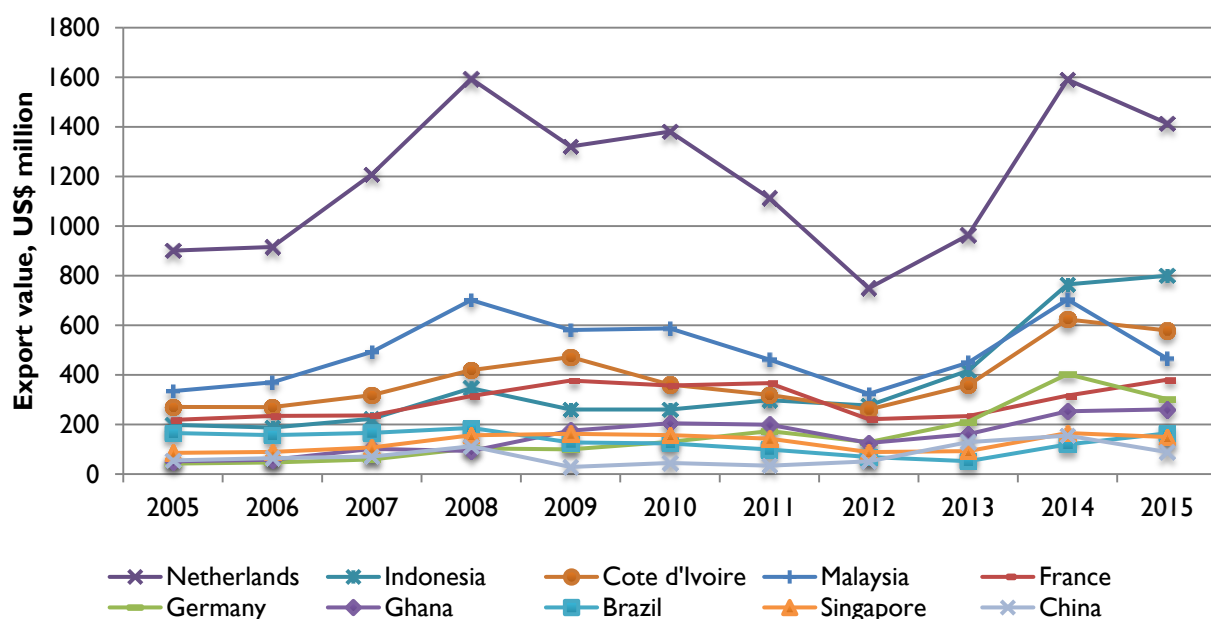
¹³ Nestlé produces in Malaysia under the brands Milo and Kit Kat, Cadbury manufacture a number of chocolate products and the Department of Islamic Development Malaysia certifies it Halal.

Figure 7. Top Ten Cocoa Paste Exporters, by Value (US\$ million), 2005-2015.



Source: UN Comtrade, HS2002- 1803; downloaded 10/25/2016

Developing countries have also slowly made advances into further downstream processing and production of cocoa butter and powder, but this is still limited. This segment of the value chain has long been dominated by the Netherlands, both in terms of volume and value. The Netherlands is a global trade hub for cocoa beans and semi-finished products that usually are exported to neighbouring countries (CBS, 2016). Nonetheless, non-traditional bases including Indonesia, Cote D'Ivoire, Malaysia and Ghana have gained market share; these four have grown their market share from 31% to 40% over the past decade, becoming the 2nd, 3rd, 4th and 7th largest suppliers in this product category respectively from 2005 to 2015 (see Figure 8). Cocoa butter is primarily destined to Belgium, Germany, the Netherlands, the UK, and the US.

Figure 8. Leading Cocoa Butter Exporters, by Value (US\$ million), 2005-2015

Source: UN Comtrade, HS2002- 1803; downloaded 10/25/2016

Chocolate trade, on the other hand, occurs primarily between developed countries, particularly those in Europe. While producing countries have made inroads into cocoa intermediates trade, developed countries continue to dominate the exports and imports of chocolate (see Figure 9 and Figure 10). Germany and Belgium lead exports while the US, Germany, UK and France are the major importers. The market size of the chocolate sector in 2016 in Western Europe accounts for US\$35 billion¹⁴ and US\$19 billion in the US (Euromonitor, 2016b).

¹⁴ The two largest consumers in Europe are the UK with US\$8.6 billion and Germany US\$ 7.8 billion (Euromonitor, 2016b)

Figure 9. Leading Chocolate Exporters, by Value (US\$ million), 2005-2015

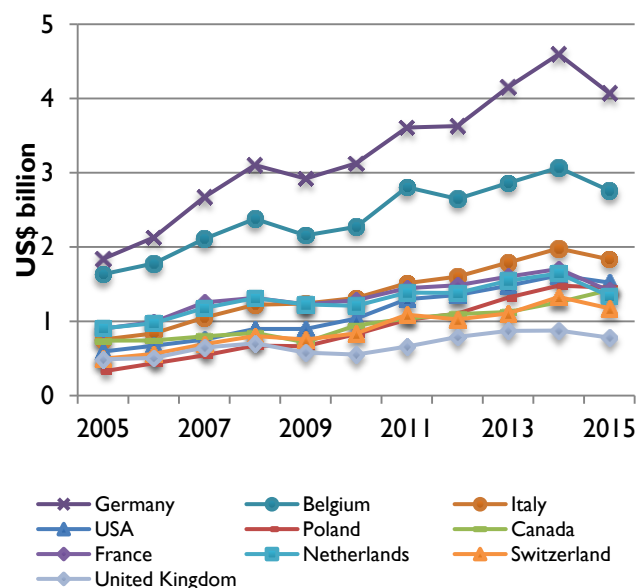
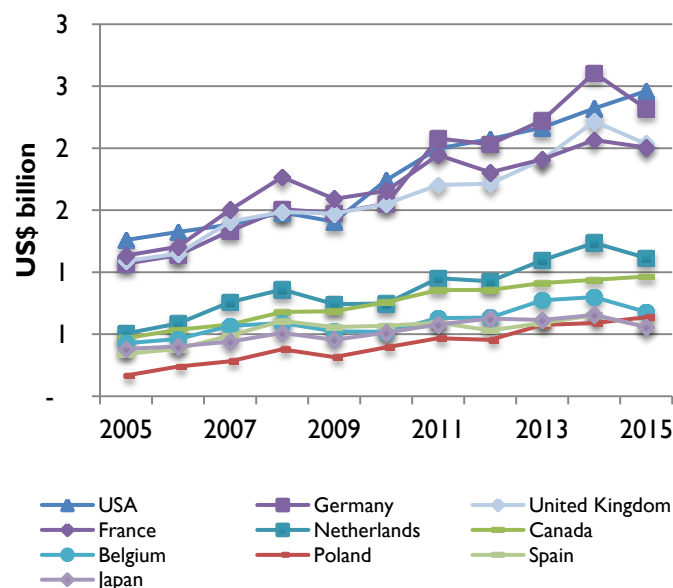


Figure 10. Leading Chocolate Importers by Value (US\$ million), 2005-2015



Source: UN Comtrade, HS2002- 1806; downloaded 10/25/2016

Regionally, Asian demand for final chocolate products has also increased. Between 2011 and 2016, regional demand increased from US\$13 billion to US\$14 billion in 2016 (Euromonitor, 2016b).¹⁵ Some US\$3 billion was supplied through imports (UNComtrade, 2016). Table 1 highlights imports for Asian nations. Chinese chocolate imports, for example, increased from US\$64 million in 2005 to US\$516 million in 2015. Asian countries have supported this significant increase in demand primarily through establishing downstream capabilities in cocoa butter and powder production. The region's share of cocoa beans imports has remained relatively stable over the past ten years, as has the import of cocoa butter. However, the region's share of global imports of cocoa paste and liquor has doubled over the past ten years. 70% of this is being supplied by Indonesia, Malaysia, Singapore and Japan. Indeed, Indonesia and Malaysia's exports of cocoa liquor to the region have expanded from around US\$66 million (2005) to over US\$407 million (2015). Only a small share of cocoa inputs is derived in developed country markets.

¹⁵ Euromonitor defines the Asian region as encompassing the following nations: Australia, Azerbaijan, China, Hong Kong, India, Indonesia, Japan, Kazakhstan, Malaysia, New Zealand, Pakistan, Philippines, Singapore, South Korea, Taiwan, Thailand, and Uzbekistan. For imports by select Asian nations see Table A-I in the appendix.

Table I. Cocoa-Chocolate Imports for Asian Countries by Segment, 2011-2015

Category	Import Value (US\$, million)					
	2010	2011	2012	2013	2014	2015
TOTAL	4966.25	5900.47	5838.26	5835.17	7035.65	5934.31
Cocoa Beans	1765.05	1840.26	1574.18	1371.89	1943.43	1330.27
Cocoa Liquor/Paste	339.99	464.87	393.15	453.78	517.63	518.35
Cocoa Butter	316.25	272.01	221.39	303.93	567.15	518.44
Cocoa Powder	441.29	645.17	668.33	475.62	407.21	368.48
Chocolate	2103.67	2678.15	2981.20	3229.96	3600.23	3198.76

Source: UN Comtrade, HS2002- 1801,1803,1804,1805,1806; downloaded 10/25/2016

2.4 Lead Firms and Governance¹⁶

At the same time as global trade trends have shifted, there has been significant restructuring of the cocoa-chocolate value chain (Barrientos, 2015). The cocoa-chocolate GVC today is characterized by two contrasting organizational structures: high degrees of concentration in the mid- and downstream stages, and considerable fragmentation of the upstream stages of production of cocoa beans (see Box 3). A small number of branded chocolate companies dominate the global consumer market, interacting with a similarly small number of mid-stream processors; these firms are highly sophisticated with a global presence and are headquartered in developed country markets.¹⁷ Production of cocoa beans, on the other hand, is carried out by millions of small farmers in developing countries who are generally underfinanced and under-educated. This has led to an asymmetrical balance of power within the chain, two small groups of lead firms control how and where value is created and distributed along the value chain, with smallholders obtaining an ever smaller share of this growing industry (Barrientos, 2015). As a result, many producers are opting out of the industry in favor of other higher paying crops or jobs. This structural challenge is creating sustainability concerns for the chocolate industry. In addition, it raises concerns about whether and, how, policymakers should promote participation in upstream production for small producers in new countries.

¹⁶ The information on this section draws considerably on recent work carried out by Duke CGGC. See (Abdulsamad et al., 2015)

¹⁷ The control of the cocoa-chocolate value chain by these two sets of actors at different nodes of the chain is often referred to as a 'bi-polar' governance structure (Barrientos, 2015).

Box 3. Key Actors in the Cocoa-Chocolate Global Value Chain

The Cocoa-Chocolate GVC has three key types of actors:

- **Producers:** Upstream production operations are undertaken by an estimated five million small farms, producing cocoa on plots of 1-4 ha of land (ICCO, 2012), primarily in the Cote D'Ivoire and Ghana. These small producers are heavily dependent on cocoa production, which can account for as much as two-thirds of household income.
- **Cocoa Processors:** The midstream counterparts in the processing segment dominate the global supply chain of cocoa ingredients and are operational in both producer and consumer countries. These lead firms are Barry Callebaut, Cargill and Archer Daniels Midland (ADM).
- **Brand Manufacturing Firms:** Lead firms in the consumer markets such as Mondelez International, Mars Inc., Nestlé, Ferrero and Hershey Co control high-value functions in brand manufacturing and marketing.

Source: Authors.

This analysis examines the roles and relationships of the two groups of lead firms –brand manufacturing firms and cocoa processors–, the source of their power and influence over the chain and the implications of this for cocoa producers in developing countries.

Chocolate Production- Brand Manufacturing Firms

Global chocolate confection has become highly concentrated, controlled by just five global brands: Mondelez International (15%), Mars Inc. (14%), Nestlé (12%), Ferrero (8%), and Hershey Co. (7%) (Euromonitor, 2014). Together these companies account for 57% of the global market.¹⁸ Each firm has an extensive network of manufacturing operations, as well as various brands marketed in numerous countries around the world (see Table 2). Several of these brands gross over US\$1 billion in revenue annually (Euromonitor, 2014). For example, the leading brand, Cadbury, owned by Mondelez International, is marketed in 41 countries, with an estimated US\$6 billion annual global retail value (Euromonitor, 2014). It controls a remarkable share of the chocolate confectionery markets in both developed and developing countries, such as: India (52%), New Zealand (48%), South Africa (40%), Australia (36%), and the UK (24%) (Euromonitor, 2014).¹⁹ Overall in the industry, concentration is high; in some of the main markets, the top three firms control as much as 60 to 80% (Euromonitor, 2012). With this strong market power, these firms have formidable influence over the operations of the cocoa-chocolate value chain.

¹⁸ At the end of the 1990s, 17 firms controlled 50% of the global markets. This declined to 13 during the 2000s (Dand, 1999; Fold, 2001).

¹⁹ Chocolate products manufactured by Mars Inc., the second largest brand manufacturer, are marketed in 80 countries under 29 brand names, including five of the billion-dollar global brands, namely, M&M's, Snickers, Galaxy/Dove, Mars, and Twix (OneSource, 2014). Kit-Kat, a major brand of Nestlé, is distributed in 62 countries and annually generates nearly US\$2 billion retail sales (Euromonitor, 2014).

Table 2. Global Chocolate Confectionery Markets and Key Brands

Company	Chocolate Confectionery Market	Top Five Brands			
		Brand Name	2013 Annual Retail Sales (US\$ million)	# of countries marketed	Largest market (US\$ million)
Mondelez International	75 Countries	Cadbury	5,894	41	UK (2,465)
		Milka	2,604	39	Germany (837)
		Lacta	1303	6	Brazil (1,221)
		Côte d'Or	600	10	France (296)
		Alpen Gold	480	7	Russia (334)
Mars Inc.	80 Countries	M&M's	3,092	65	USA (1,861)
		Snickers	2,864	75	USA (1,154)
		Galaxy/Dove	2,428	26	China (841)
		Mars	1,722	59	USA (428)
		Twix	1,220	64	USA (369)
Nestlé SA	76 Countries	Kit Kat	1,890	62	UK (484)
		Garoto	797	5	Brazil (722)
		Nestlé	746	34	China (237)
		Smarties	425	38	UK (132)
		Especialidades	337	1	Brazil (338)

Source: (Euromonitor, 2014)

These firms derive power from their overall business portfolio in food and beverages, which allows for large-scale cost efficiencies offered by economies of scope and vertical-integration in confection. In addition to chocolate manufacturing, they typically operate across many adjacent categories that use industrial chocolate, such as biscuits, bakery goods, and beverages. Nestlé, the world's largest food and beverage manufacturer, supports its product portfolio with an extensive global presence, including 461 production facilities in 83 countries (IBISWorld, 2014). Similarly, Mondelez International, operates across five consumer products, manages a global network production and marketing infrastructure that incorporates 171 manufacturing facilities in 58 countries (OneSource, 2014). Besides the physical infrastructure, brand manufacturers have mobilized remarkable workforce capabilities and sizeable annual research budgets. Mondelez International's research and development activities are carried out by 2,750 food scientists, chemists, and engineers and was financed by a US\$471 million budget in 2013 (OneSource, 2014). These scale economies remarkably lower average cost and create entry barriers in these segments controlled by lead firms.

Intermediate Cocoa Processors

Global supply chains for intermediate ingredients have become vertically integrated and highly concentrated with a handful of trader-processor firms emerging. These firms draw on their internal expertise and long-established capabilities in global supply chain management across multiple commodities. In the cocoa sector, they operate vertically integrated supply chains that span from the rural areas in cocoa producing countries to major portal cities housing advanced processing facilities in Europe and North America. Once operated separately, between the 1970s and 2000, trading and processing functions became increasingly integrated and began consolidating around a

small number of highly capable firms.²⁰ By 2014, just three large trader-processors, Barry Callebaut (23%), Cargill (15.3%), and ADM (now Olam)²¹ (12.7%), controlled approximately 51% of the cocoa processed worldwide (Statista, 2014). Barry Callebaut cocoa is used in 25% of all consumer products containing cocoa or chocolate (Barry Callebaut, 2016a).

Large cocoa processors leveraged long-established capabilities in management of global commodity supply chains to solidify their competitive advantage in the cocoa-chocolate GVC. In particular, internal expertise in logistics and bulk trade in grains was transferred to the cocoa sector. Beginning in 1995, large processors started experimenting with containerized-bulk-cocoa transport (Dand, 1999). This new method resulted in major efficiency gains, lowering shipment costs by nearly 40% (Dand, 1999; Tollens & Gilbert, 2003). By 1997, the transport cost was reduced to one-third when mega-bulk shipment (bulk cocoa being loaded directly into the holds of specialized double-hulled carriers) was introduced (Tollens & Gilbert, 2003). In effect, these developments galvanized further consolidation in the chain because only a few large processors themselves were able to make direct use of the mega-bulk shipment, requiring 3,000-10,000 ton minimum efficient scale (Dand, 2011). Other exporters either had to use high cost traditional bag-based-export methods or to assign their beans to one of these large firms. These large processors dictate where to establish their operations, usually in the main cocoa producing countries in order to optimize transportation or close to the end markets. For example, Olam has state-of-the-art cocoa processing factories turning cocoa beans into liquors, butter and cake in Cote D'Ivoire, Nigeria, Ghana and Brazil and in developed countries in Canada, Germany, Singapore, Spain, the Netherlands and the UK (Olam, 2017). Cargill has cocoa factories in Brazil, Ghana, Cote D'Ivoire, Indonesia, France, Germany, Netherlands and UK (Cargill, 2017).

These processors have typically focused on the production of intermediary products with no consumer-facing marketing activities. Nonetheless, in recent years, they have also moved into the industrial production of chocolate. Barry Callebaut (40%) and Cargill (30%) together control 70% of the industrial chocolate production in the open market (Statista, 2014). Under popular global business-to-business brands, for instance, Barry Callebaut (Cacao Barry and other six brands), Cargill (Gerken Cacao), and Olam (deZaan), cocoa processors supply industrial chocolate, as well as cocoa powder, to customers such as specialty manufacturers, and artisanal producers, including bakers, pastry chefs, hotels, restaurants and caterers (Euromonitor, 2012). Cargill has chocolate production in Canada, US, Brazil, Belgium, France, Germany, the Netherlands and UK (Cargill, 2017).

Processors need to supply and respond to the demands of chocolate brand manufacturers. With considerable purchasing power, together with inherent knowledge of the cost structure of cocoa processing (Fair Labor Association, 2012), chocolate brand manufacturers have developed strong price-negotiating positions with the larger trader-processors. They generally require processors to report detailed information under specific supply contracts. The Nestlé Cocoa Plan contracts, for example, representing 20% of cocoa volume Nestlé sources from Cote d'Ivoire, requires contract suppliers to report on the volume, quality, and costs, as well as the number of farmers trained (Fair Labor Association, 2012).

²⁰ Between 1990-2000, the number of cocoa processors in Europe declined by more than 75%, falling from around 40 to just nine firms (Kaplinsky, 2004).

²¹ Olam International, a global commodity trader, acquired ADM's cocoa business in 2015 (Olam, 2015).

Cocoa Bean Producers

By comparison, the upstream segment of the cocoa-chocolate GVC has a highly-fragmented market structure. Cocoa production occurs on an estimated five million small farms, producing cocoa on plots of 1-4 ha of land (ICCO, 2012). Local cocoa trade also involves large number of local collectors or buying agents, often situated in captive relations or working on commission for large traders.²² Income from cocoa farming is low. Since liberalization and the dissolution of national marketing boards in producing countries, smallholder farmers have been compelled to bear the increasing costs and risks of production. Farmers lost access to subsidized inputs and services, including credit, extension, quality control and marketing. Expectation was that removing the state would free the market for private actors to take over these functions—reducing costs, improving quality, and eliminating inefficiencies. However, in most cases this did not occur, leaving the majority of smallholders exposed to extensive market failures, high transaction costs and risks, and service gaps (Barrientos, 2015; World Bank, 2008). As a result, cocoa farms have since entered a period of perpetual underinvestment, decreasing productivity, and increased incidences of pests and diseases. This has been an important contributing factor of the current sustainability challenge (Barrientos, 2015).

Limited opportunities for farmers to increase value of their products. The structural transformations described above in the mid- and downstream stages of the chain have created an oligopolistic market for smallholders, who have experienced persistently declining cocoa prices and a reduction in opportunities for value addition at the farm level (Barrientos, 2015). Furthermore, critical quality control points gradually shifted from the farm gate to the processing stage, reducing local buyer incentive to compensate farmers for better quality (Tollens & Gilbert, 2003). The required scale of bulk transportation necessitated blending of variable-quality beans. Not willing to sacrifice the cost advantage in transportation, large processors, instead, have developed internal processing mechanisms to meet quality requirements of the downstream buyers (Tollens & Gilbert, 2003). These factors highlight the challenges for effective smallholder participation in the chain.

2.5 Standards & Certifications

In hopes to improve the returns for producers from participation in the cocoa chain, developing country governments and producers alike have begun to turn to certifications for their products. Fully understanding how certification schemes operate in the GVC, however, is important in weighing whether the benefits outweigh the high costs. This section presents the evolution of standards in the sector, highlights how different schemes affect market access and affect the bottom line for producers.

Since the early 2000s, as in other high value agricultural products, different forms of standards emerged in light of growing concern about the economic, social and environmental sustainability of production in developing countries. These included industry codes of conduct, standard and certification schemes, and multi-stakeholder initiatives (Bitzer et al., 2012). In particular, two key factors drove the incorporation of standards and certifications into the cocoa-chocolate value chain: First, the industry became the target of global campaigns by nongovernmental organizations

²² Total employment in the sector reaches approximately 14 million workers worldwide, with its three-quarter concentrated in Africa (Abdulsamad et al., 2015).

(NGOs) and the media that made allegations of child labor and child trafficking on cocoa plantations in West Africa (Schrempf-Stirling & Palazzo, 2013). The connection of valuable brands with child exploitation posed serious threat to corporate reputation and sales (Schrage & Ewing, 2005). Second, the internal threat to the sector in the form of farmer exit, low productivity, aging trees and farmers, and a high incidence of pests and diseases fueled concerns over the future shortages of cocoa supply (Barrientos, 2014, 2015; Barrientos & Asenso-Okyere, 2008)

Three main standards have emerged in the cocoa-chocolate GVC: Fairtrade, Rainforest Alliance, and UTZ Certified, with a fourth, IFOAM also cited as an important certification for the sector (Potts et al., 2014).²³ These certifications are voluntary private standards, and producers can decide whether or not to pursue these avenues for differentiation. The share of certified cocoa has expanded dramatically over the past five years. Starting from a small base, mainly IFOAM and Fairtrade, that accounted for less than one percent of global production in 2008 (KPMG, 2013; Potts et al., 2014), the net volume of certified cocoa supply reached 22% of total production worldwide in 2012 (Potts et al., 2014).²⁴ The rapid growth was fueled by industry corporate social responsibility programs and UTZ and Rainforest Alliance NGOs, whose certifications expanded, respectively, at compound annual growth rates of 363% and 223% between 2008 and 2012 (Potts et al., 2014).

²³ IFOAM works to ensure production relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects, certifying beans as organic. In 2011, 75% of IFORM beans were sold as certified, amounting to 77,539MT of the 103,554MT produced (Potts et al., 2014).

²⁴ This volume accounts for total certified production after adjustment for overlapping and multiple certifications that together represented one-third of the total reported certified volume by the related organizations in 2012.

Table 3. Key Certifications: Volume of Certified Cocoa Produced and Sold by Certification Scheme, 2012

Certification Scheme	Production (MT)	Bean Sales by Volume (MT)	% Sold as Certified	Certification key objective	Companies Committed
UTZ certified	534,614	118,641	22%	Sets sustainability and traceability standards that stress the use of shade trees, best practices for drying and fermentation and proper use of fertilizer and pesticide	Barry Callebaut, Cargill, Ferrero, Hershey, Mars, Mondelez, Nestlé, and Olam
Rainforest Alliance	405,000	205,784	51%	Certification that seeks to improve income and promote sustainability by setting minimum production standards for farmers	Nestlé, Ferrero, Hershey, Barry Callebaut, TESCO, Mars, Olam and Cargill
Fairtrade International	175,900	68,300	39%	Helping smallholders and farmer associations receive higher prices from buyers while promoting sustainable development and growing practices	Barry Callebaut, , Cargill, Ferrero, Hershey, Mars, Mondelez, Nestlé, and Olam
Total *	1,219,068	470,264	--	--	--
Total Certified (Adjusted for multiple certifications) **	890,000	300,000	33%	--	--

*Totals include IFOAM data for 2011

**Almost one-third of total certified production represented overlapping certification. As reported by the individual certification schemes, certified production approximately accounted for 30% of global cocoa production. Adjusted production levels of certified cocoa amounted to 22% of global production.

Source: (Potts et al., 2014)

The global demand for certified cocoa, however, trailed far behind the available supply in 2012. Although in some major markets, such as the UK, there was ten-fold growth in fair chocolate sales between 2008 and 2010 (Barrientos, 2015), just one-third of the certified supply was actually sold as certified (see Table 3). The effective global market share of certified cocoa still remains marginal, just 7.3% of the estimated 4.1 million ton cocoa produced worldwide in 2012 (FAOSTAT, 2014; Potts et al., 2014). Furthermore, the share of consumer price that accrues to a certified cocoa producer is still marginally small, not much different from conventional cocoa (ITC, 2011). The more significant benefits continue to accrue to the lead firms. Given the current low demand for certified cocoa, the relatively low pay offs and at times high cost of certification – such as investment in infrastructure, and traceability systems which is often born by the producers themselves (KPMG, 2011), it is debatable whether the benefits outweigh the costs.

Several studies have indicated that even though the price received for certified cocoa may not differ from commodity cocoa (ITC, 2011), participation in the certification process has important indirect benefits – particularly with respect to farm productivity. Training to farmers, a criterion required by certifying agencies, can help improve yields, given the absence of, or dysfunctional, extension services (Kessler et al., 2012). One recent study by the Committee on Sustainability Assessment (COSA) reports the differences observed across a number of indicators between certified and non-certified cocoa and coffee farmers in 12 countries (COSA, 2013). Drawing on data points derived from between 3,500 to 16,000 farm surveys per country, the study noted that certified farmers demonstrated better training in farming techniques, improved farm practices (soil and water conservation, conserving biodiversity), higher yield (+14%) and a modest difference in net income (+7%) (COSA, 2013).

Nonetheless, many of the leading brands have made certification commitments, often targeting a specific percentage of cocoa-sourcing by 2020 (Barrientos, 2015). Five of the top ten chocolate manufacturers, including Nestlé, Ferrero, Hershey and Mars have committed to buy 100% UTZ certified cocoa by 2020 (UTZ, 2017). Mondelez International is already the leading buyer of Fairtrade certified cocoa, and Mondelez brand, Cadbury, signed an agreement with Fairtrade in November 2016 to improve the livelihood of cocoa farmers (Cadbury, 2016b; Mondelez International, 2016). Even private label firms have committed to procure only certified cocoa; for example, in July 2016, Tesco, the largest supermarket chain in Europe, announced that all cocoa required for its private label chocolate products sold in the UK will be from Rainforest Alliance certified sources by the end of 2018 (Tesco, 2016). At a national level, governments of the Netherlands and Germany have also made serious commitments to sourcing certified cocoa (Barrientos, 2015). With these major buyers signing on to almost exclusively source certified cocoa, demand in the long term is poised to rise significantly and certification will no longer be a differentiating factor in the industry, but a requirement for market access.

Box 4. Key Takeaways

Strong and rising global demand in the industry is a major advantage in the industry; however, sustainable production is becoming more and more difficult. The consolidation of the mid- and downstream segments of the value chain, with a very small number of companies dictating how producers must cultivate their crops while using their economies of scale and scope to minimize the price paid to producers, undermines smallholder participation. Despite high demand for chocolate, producers often undertake higher cost production for a lower farm gate price. Furthermore, the increased demand and commitment by lead firm to source only certified cocoa beans adds further challenges for small producers.

At the same time, high levels of domestic production appear to be vital for driving downstream production opportunities. Leading producing countries are strongly incentivizing ‘origin grindings’, which ultimately could reduce global availability of raw cocoa beans. The opportunities in the short-term for processing remain in the production of cocoa butter and powder and chocolate manufacturing. Large processors and chocolate manufacturers with global operations dominate these segments; these firms evaluate location decisions according to availability of supply of raw materials, costs of production, and proximity to major markets.

3. The Philippines and the Cocoa-Chocolate Global Value Chain

The Philippines participation in the cocoa-chocolate GVC is limited, despite many competitive advantages. The country has produced cocoa for centuries and has good climatic and geographical conditions for its production. However, exports remain low; globally, the country ranks 72nd in exports with a global market share of less than 0.01% (UNComtrade, 2016). In 2014, only eight Filipino firms participated in the cocoa-chocolate GVC (PSA, 2007-2014).²⁵ The growing global demand discussed in earlier sections represents an opportunity for the Philippines to grow its economy; however, it must first address important constraints along the value chain to ensure efforts to promote the industry can provide for sustainable long-term engagement in the sector.

Production of cocoa beans and farm-level issues are the primary challenges to the Philippines' participation in the cocoa-chocolate value chain, constraining upgrading into higher processing stages. Production of cocoa beans is limited due to low quality seedlings, inefficient farm-level processing techniques and limited access to capital and training for farmers. An aging farmer population and younger generations seeking employment outside the agriculture sector further limit production. These issues undermine the supply of cost-competitive raw cocoa beans for the manufacturing segments (Field Research, 2016).²⁶ Cocoa bean yields are well below the global average and there are not enough domestic beans to justify either "origin grindings" for export or even for the domestic market. As a result, grinding capacity is limited in the Philippines, and the number of large scale grinding firms is shrinking. The primary role the Philippines has played in the cocoa-chocolate GVC in recent years is as an importer of intermediate and final products for domestic consumption.

This section seeks to further understand the depth and breadth of GVC participation in the Philippines to provide a foundation for analyzing how the country can take advantage of available opportunities. First, using trade and firm-level data, the current products and exports are examined. It then outlines the structure of the industry and key firms active in the country at each stage of the value chain. It concludes with advantages and constraints that will shape future participation in the cocoa-chocolate GVC.

3.1 Current Participation in the Cocoa-Chocolate Global Value Chain

Despite a history of cocoa bean production dating back to the 17th century (Philippine Cacao, 2016), the Philippines' current output is limited compared to other global and even regional players, generating a total of just over US\$24 million in exports in 2015 (UNComtrade, 2016). While exports grew steadily over the last decade, increasing by 288% from 2005 to 2015, the nation's participation in the GVC remains small compared to other nations in the region. Table 4 details these exports by value chain stage in both volume and value.²⁷

²⁵ Participation in the coco-chocolate GVC is defined as export sales over US\$500,000.

²⁶ Large-scale grinding operations require approximately 40,000 and 50,000MT of raw materials in order to operate at competitive economies of scale (Field Research, 2016).

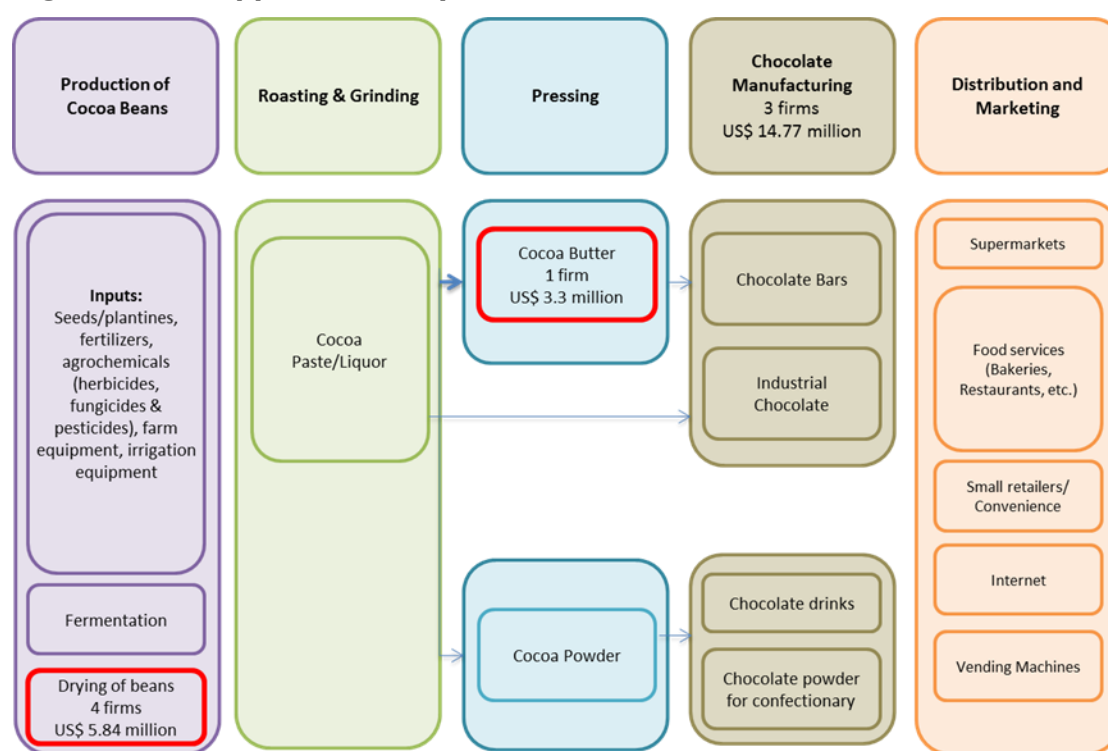
²⁷ Table A-2 in the Appendix profiles top export destinations by GVC segment.

Table 4. Export Volume and Value of Philippines Cocoa Exports, 2005-2014

Category	Export Value (US\$, million)						Export Volume (MT)					
	2005	2007	2009	2011	2013	2015	2005	2007	2009	2011	2013	2015
TOTAL	6.28	9.54	11.5	17.1	24.2	24.4	2.46	3.09	3.09	4.68	7.81	6.33
Cocoa Beans	.09	.14	.72	1.33	2.00	5.84	53	75	259	425	2,235	1,912
Cocoa Liquor/Paste	.28	.58	1.42	1.51	.43	.004	141	271	519	381	142	1
Cocoa Butter	3.25	3.21	3.06	5.19	4.03	3.30	940	720	549	1,183	918	561
Cocoa Powder	.07	.05	.04	3.01	.13	.47	27	30	16	765	81	403
Chocolate	2.58	5.56	6.22	6.09	17.6	14.8	1,301	1,996	1,746	1,928	4,436	3,450

Source : UN Comtrade based on HS codes 1801, 1803, 1804, 1805, 1806. Retrieved on October 25, 2016.

The current position of Philippines in the cocoa-chocolate GVC is illustrated in Figure 11 by the red rectangles. These are segments where 2015 exports were above US\$1 million (UNComtrade, 2016). In addition, each segment includes the number of firms exporting over US\$500,000. Overall, few Filipino firms participate in the cocoa-chocolate GVC—only 8 firms reported exports over US\$500,000 in 2014 (PSA, 2007-2014).

Figure 11. Philippines Participation in the Cocoa-Chocolate GVC


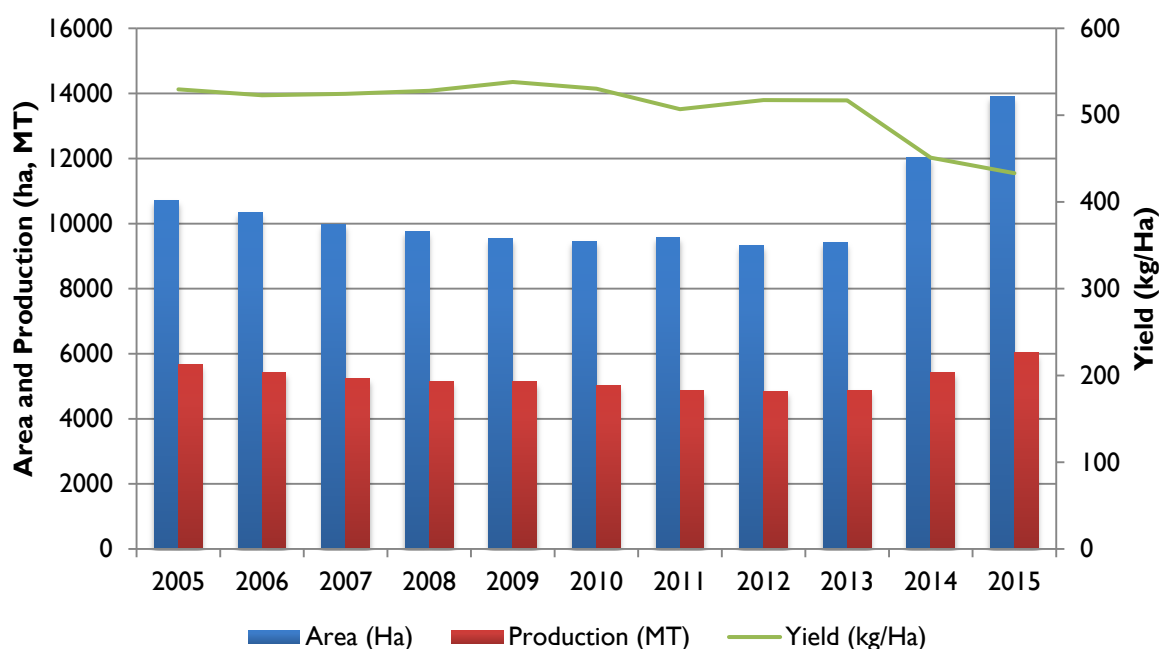
Source: Authors

This section details this participation in the value chain, exploring recent trends in the Philippines in three relevant segments: production of cocoa beans, mid-stream processing and chocolate manufacturing.

Production of Cocoa Beans: Production peaked in the 1990s at 35,000 tons and has since declined due to aging trees, depressed producer prices and climatic conditions. As a result, by 2015, the Philippines produced only 6,020 tons of cocoa beans (Field Research, 2016). Statistics on production are inconsistent. Industry players estimate production to be between 10,000 to 12,000 tons (Field Research, 2016). However, the Philippine Statistical Authority (PSA) places the number lower, reporting approximately 6,000 tons in 2015 (PSA, 2016).

Production data indicates constant harvest despite increases in production area by over 3000 ha from 2005 to 2015 (see Figure 12). Yields grew marginally at the beginning of this period, increasing from 530 kg/ha in 2005 to 538 kg/ha in 2009, but subsequently declined, with yields of 433 kg/ha reported in 2015 (PSA, 2016). Declines in productivity could reflect planting of new trees that are not matured; however, numbers over the last decade all indicate the Philippines is well below global productivity standards of 800-1,000 kg/ha (Fernandez-Stark & Bamber, 2012). Current initiatives as part of the harmonized industry road map seek to increase production to 100,000MT by 2022 (Philippine Cacao, 2016). However, it is too early to determine the effectiveness of programs designed to help reach this goal.

Figure 12. Philippines Cocoa Bean Production, 2005-2015



Source: Philippine Statistical Authority based on Cacao production. Retrieved on January 5, 2017.

The primary variety of cocoa bean grown in the Philippines is Trinitario, accounting for nearly 80% of all beans (Field Research, 2016). Trinitario beans, a mid-value hybrid bean, have a higher resiliency than the Criollo variety, and a higher quality and taste characteristics than Forastero beans (see Box 2). Geographically, the production of cocoa beans is highly concentrated. Mindanao accounts for 90% of cocoa bean production in the country, with almost 80% of production occurring in the Davao region. However, production is expanding to new areas (Field Research, 2016).

Smallholders are the primary growers of cocoa beans in the country, accounting for over 90% of production (Field Research, 2016). No official census of the number of cocoa bean farmers exists, however, industry experts estimate 10,000 to 15,000 cocoa bean growers cultivate an aggregate area of 11,200 ha or 3.88 million trees (Philippine Cacao, 2016). This is equivalent to an average of 0.9 ha or 346 trees per farmer. At an average production of 510 kg/ha, each grower harvests 454 kg per year (DA-HVCDP, 2016; Field Research, 2016; PSA, 2016).²⁸

Most locally produced cocoa beans are used domestically in the production of *tablea* and artisanal chocolate,²⁹ with little available for commercial grinding. The Philippines exported only 1,912 tons in 2015, although in value terms, cocoa beans exports grew considerably over the past decade, from almost no exports in 2005 (less than US\$100,000) to nearly US\$6 million in 2015 as a result of rising global prices (UNComtrade, 2016). Interestingly, the Philippine's increase in export value is the result of both increased export volumes and increased unit value (UNComtrade, 2016). Cocoa bean exports go mainly to regional countries. In 2015, 99% of all cocoa beans went to Malaysia and Thailand (UNComtrade, 2016). The export of cocoa beans is concentrated with only four firms exporting cocoa beans more than US\$500,000 in 2014 (PSA, 2007-2014). The largest export firms involved in cocoa bean export are Kenner Foods International, with an estimated 2,000 tons in exports per year, Casco Commodities with an estimated 1,500 tons in exports, and Chokolade de San Isidro with an estimated 500-700 tons in exports per year (Field Research, 2016). These numbers, however, reflect higher export volumes than those reported in UN Comtrade, making it difficult to corroborate firm information.

Mid-Stream Processing: With a lack of domestic supply of cocoa beans, and consolidation of this node of the GVC at the global level, the number of firms who do large scale grinding in the country has dropped. In the 1990s, 13 firms had grinding operations in the Philippines; by 2005, the number decreased to just three: Commonwealth Foods, Nestlé, and Cocoa Specialties (Field Research, 2016). By 2015, only two large-scale grinders were operating in the Philippines:³⁰ Commonwealth Food and TP Food. Commonwealth Foods imports its beans, as does TP Food, although the latter continues to buy some local beans. TP Foods relies on Indonesia for its beans source; Indonesian beans have increased in costs since the country implemented an export tax in 2010 (see Section 4.2)(Field Research, 2016). As firms reduced their local capacity, exports of cocoa liquor and paste have also been reduced to insignificant levels; in 2015, the country exported just US\$4,000 in this product category (UNComtrade, 2016).³¹ Only one firm exported cocoa butter at amounts above US\$500,000 in 2014. Exports from cocoa butter totaled US\$3.4 million in 2015 with exports going to major chocolate producers in the US and Western Europe (UNComtrade, 2016).

²⁸ The Department of Agriculture's High Value Commercial Crop Development Program estimates that the 2013 farm gate price of PHP 65/kg (US\$1.31) resulted in annual gross earnings of PHP 29,500 (US\$596.15) per farmer (DA-HVCDP, 2016) Comparatively, in 2013 palm oil had a farm gate price of PHP 3.86/kg (US\$0.08) and Robusta coffee's farm gate price was PHP 67.84 (US\$1.37) (PSA, 2016).

²⁹ Some chocolate makers, like Antonio Pueo, and several *tablea* firms have small grinding operations in the Philippines.

³⁰ Since 2005, Cocoa Specialties closed their grinding operations and Nestlé closed their grinding group. They now buy only powder (Field Research, 2016).

³¹ In the Philippines, most cocoa bean production goes towards domestic consumption in the form of chocolate and *tablea*. *Tablea* is a traditional Filipino product made cocoa beans that are roasted, ground and molded nibs of fermented pure (100%) cocoa beans. No official data on production is available, but industry experts estimate production to be less than 1,361 tons annually (Field Research, 2016).

Chocolate Production: Chocolate exports, although minimal, at just US\$17 million in 2015, accounted for the Philippines' most significant participation in the GVC (UNComtrade, 2016). The largest buyer of Philippine chocolate in 2015 was the US, buying over half of all exports. The bulk of these exports are from the top five firms, which together account for 94% of all chocolate exports (PSA, 2007-2014).³² Notable exporters include Universal Robina, Malagos Agri-Ventures, Antonio Puelo, Kablon Farm Foods, Dalareich Food Products, and Chokolade de San Isidro (Field Research, 2016). However, generally speaking, these chocolate exporters do not source inputs from local suppliers. Rather they prefer to use imported powder and beans compared to domestic supply because of issues with supply quantity (Field Research, 2016). Although several MNCs have operations in the Philippines, these are import-based operations to serve the local market. Chocolate demand in the country is high (see Box 5) and is served by many local and global companies. The strong local demand can serve as a driver for export capabilities by spurring investments in the industry.

Box 5. Strong Domestic Demand: A Potential Development Ground for Export Capabilities

Domestic demand for chocolate is increasing, mirroring the global trend. Table 5 shows the steady retail growth of chocolate in the internal market since 2011. Demand is highest from October to February, largely due to holidays where chocolate consumption is customary. These months of increased demand correlate with harvest seasons. Philippine consumers prefer imported chocolate products, but increasingly domestic firms have been able to differentiate their products and increase demand by promoting single-origin chocolates to consumers (Euromonitor, 2016a). Chocolate consumption is varied with most sales (54.14% of total chocolate sales in 2015) from countlines- boxed chocolate in individual packages for resale at retail locations. Chocolate bars and chocolate pouches -individual sized candies packaged for home consumption, are the next largest retail categories are also high selling categories with 21.5% and 17.6% respectively (Euromonitor, 2016a).

Table 5. Retail Sales of Chocolate in the Philippines by Category, 2011-2015

Category	Sales (US\$, millions)				
	2011	2012	2013	2014	2015
Total Chocolate Confectionery	231.3	242.5	261.7	287.3	306.3
Chocolate Pouches and Bags	45.4	46	46.8	50.1	54.1
Boxed Assortments	22.1	20.8	21.1	21.61	22.4
Countlines	106.4	117.1	133.5	152.8	165.8
Chocolate Tablets or Bars	57.5	58.6	60.4	62.8	65.9

Source: (Euromonitor, 2016a)

Note: Conversion to US\$ is based on an exchange rate of PHP 49.77 per USD

The country is a net importer in all segments except cocoa beans (see Table 6). Imports to the nation grew 210% between 2007 and 2015. Chocolate and cocoa powder imports both increased by 261% and 255% respectively from 2007 to 2015 (UNComtrade, 2016). Growth in these sectors reflects strong local demand for finished goods and a lack of local processing capacity in mid-stream stages of the value chain.

Cocoa powder is also concentrated and regionally focused, with 85% of cocoa powder coming from Malaysia, Indonesia, and Singapore in 2015 (UNComtrade, 2016). Chocolate is less concentrated with the top three sourcing nations accounting for 52% of all Philippine exports.

³² 27 firms registered chocolate exports in 2014 but only 3 exported over US\$500,000.

Table 6. Philippines Cocoa-Chocolate GVC Import Value, 2007-2015

Category	Import Value (US\$, million)					Share of Total Cocoa Import				
	2007	2009	2011	2013	2015	2007	2009	2011	2013	2015
TOTAL	42.6	58.7	106.0	82.9	132.0	--	--	--	--	--
Cocoa Beans	.17	.05	1.07	.58	.88	0.41%	0.08%	1.01%	0.70%	0.66%
Cocoa Liquor/Paste	5.8	10.1	17.9	1.9	0.8	13.6%	17.2%	16.9%	2.34%	0.59%
Cocoa Butter	.33	.52	1.53	.83	0.21	0.76%	0.89%	1.44%	1.00%	0.16%
Cocoa Powder	11.9	21.3	54.7	41.0	42.1	27.9%	36.3%	51.6%	49.4%	31.9%
Chocolate	24.4	26.7	30.9	38.6	88.1	57.4%	45.5%	29.1%	46.5%	66.7%

Source: UN Comtrade based on HS codes 1801, 1803, 1804, 1805, 1806. Retrieved on October 25, 2016.

Note: Data on the Philippines' 2005 cocoa imports are not available in the UN Comtrade database.

3.2 Key Firms & Industrial Organization in the Philippines Cocoa-Chocolate Sector

Securing cocoa beans is a major requirement for participation in the cocoa-chocolate GVC in the Philippines. Cocoa bean aggregators and exporters are the main coordinators of the industry and have most of the power compared to smallholder producers which are largely fragmented. Cocoa bean aggregators use a variety of sourcing methods to supply beans including contract growing, open market buying, and managed farms.

The largest cocoa bean exporter by volume in 2015 was Kennemer Foods International (KFI) (Field Research, 2016). KFI, a Dutch owned company, gets cocoa beans through contract growing covering 2,000 ha, open market buying and managed farms. Under the contract growing approach, KFI sells cocoa bean growers the necessary inputs and seedlings and offers guaranteed buy-back contracts and training to increase yields and quality (Bakker, 2015). It also offers financial assistance when needed for farm improvements. On the open market, KFI purchases wet and dry beans at various buying stations and post-harvest facilities in the country. Finally, the firm operates company farms, hiring workers to cultivate cocoa beans and engaging in revenue sharing programs (Sun Star Davao, 2016). Many of Kennemer's exported cocoa beans go to Malaysia, Singapore and Indonesia. In addition to cocoa bean export, Kennemer partners with the global chocolate manufacturer- Mars in the country (Field Research, 2016). Casco Commodities, another cocoa bean exporter, primarily supplies European markets primarily and partners with the global processor Barry Callebaut (Sun Star Davao, 2016).

Aggregation for export remains difficult; local farmers prefer to sell their beans for domestic use rather than export due to higher domestic prices. The estimated 2016 global market price for cocoa beans is approximately PHP 140/kg (US\$2.81) but local buyers will buy cocoa beans at PHP 150-160/kg (US\$3.01-3.21), depending on the quality and grading of the bean (Field Research, 2016).

3.3 Advantages and Challenges for Upgrading in the Philippines

The Philippines participation in the cocoa-chocolate GVC is small but growing. Increased participation is possible due to several advantages, including favorable environments for bean production across the country as well as its strategic location close to emerging consumer markets

throughout Asia. However, the nation must address issues of low cocoa bean productivity and lack of coordination among value chain actors before moving to processing stages of the value chain.

3.3.1 Advantages

The Philippines' most pronounced strengths in the cocoa-chocolate GVC relate to the geographic conditions that allow the growth of higher value cocoa beans across the nation. The most prominent include the following:

1. Geographic conditions provide large potential production area. Cocoa beans may be widely produced in the Philippines and do well as intercroops (Field Research, 2016). The majority of production occurs in the southern island of Mindanao, but increasingly production is spreading to other parts of the nation (Field Research, 2016). The climate, rainfall, and average temperature of the nation promote cocoa bean growth. Furthermore, these conditions are present across the nation and not concentrated in select areas. ICCO estimates that the entire nation falls within the geographic area where cocoa production is possible (ICCO, 2017b). Furthermore, as a shade crop cocoa does well in intercropping schemes with many other agricultural products of the Philippines, such as coconuts and bananas.

2. Ability to grow all of the three main cocoa bean types. The majority of cocoa beans are mid-value, Trinitario beans. All of the three varieties of beans are present and grown in the nation, though Trinitario beans are the most prominent. Criollo beans are mainly from older trees that are lower yield but are still produced. Higher value varieties of Forastero beans are beginning to be planted on some farms (Field Research, 2016). The suitability of the country for diverse types of cocoa beans helps in diversification efforts and will minimize the risks and challenges associated with planting only one variety. A strong focus on Trinitario beans in expansion initiatives could be sufficient to make the nation competitive on the global market.

3.3.2 Challenges

The Philippines' competitive challenges in the cocoa sector are especially formidable in upstream segments of the chain. The lack of an adequate local supply of cocoa beans has undermined the processing segment and led to several operations shutting down. Downstream firms cite the lack of stable production as a major constraint preventing growth or entry into export markets. The following section outlines the most prominent constraints.

1. Lack of modern production operations in agriculture. The agricultural stage of cocoa production in the Philippines is plagued by numerous issues, which have undermined its growth and further participation in the GVC. The industry is dominated by aging, smallholder producers on small plots of land using outdated farming techniques. The average age of Filipino farmers is 57 (DAR, 2013). Consequently, many are hesitant to adopt new technologies because of the limited time to see returns on investment. Incomplete land reform programs mean that many farmers do not yet have titles to their land, and thus have no collateral to obtain the loans necessary to implement more modern agricultural techniques to improve farm yields and minimize post-harvest loss (Field Research, 2016).³³ As a result, some farmers lack the capital to upgrade to modern

³³ Estimates suggest that for every hectare you need approximately PHP 80,000 (US\$1606) to initiate the planting of cacao, and an additional PHP 30,000 (US\$602) each additional year to maintain the land (Field Research, 2016).

farming techniques including securing proper fertilizers or seeds. Others are reluctant to change farming techniques from traditional modes (Field Research, 2016). Many farms thus are not implementing advanced-farming techniques. No official statistics are available, but industry association representatives estimate that only 20% of cocoa farmers have shifted to new technologies to help increase productivity (Field Research, 2016).

Uptake of certifications has also been low, due to the high associated costs, despite the accelerated tendency in the global market to source only from certified operations. Few operations are certified, one of the more notable firms to have certification is Chokolade de San Isidro (DTI-BOI, 2016; Field Research, 2016). The DA promotes its own GAP practices for cocoa but farmers also struggle to produce the capital needed to achieve and maintain these certifications.

2. Lack of economies of scales. Production is fragmented among many small farmers creating problems of access to markets and decreasing bargaining power. It is estimated that in the Philippines there are among 10,000-15,000 cocoa bean farmers. There are some cooperatives in the country that are coordinating efforts to reduce transaction costs. However, one of the main concerns is that side-selling threatens value chain coordination efforts. It is difficult for cooperatives to achieve quantities needed to meet contracts because farmers often sell on the side cocoa beans to traders who offer higher prices or will buy unfermented beans giving farmers quicker access to cash. As a result, farmer associations, who are the principle organizers of farmers, are limited in their ability to aggregate harvest and implement new post-harvest techniques that can improve the quality and quantity of output in production.

Membership in farmer associations is low compared to other nations. One of the larger associations in the nation Subasta Integrated Farmers Multi-Purpose Cooperative has over 100 members (Field Research, 2016). Cocoa cooperatives in other producing countries are much larger. For example CONACADO, a cooperative in the Dominican Republic has approximately 10,000 members (Fernandez-Stark & Bamber, 2012). Subasta sells through exclusive buying contracts, open markets and under their own product line (Field Research, 2016).

3. Underdeveloped post-harvest fermentation and drying techniques lead to reductions in quality and amount of beans suitable for processing. Proper fermentation and drying is essential for protecting the quality of the cocoa bean and preventing post-harvest losses. This increases the selling price for farmers; unfermented beans sell for PHP 40-60/kg (US\$0.80-1.20) compared to the fermented beans selling price of PHP 140-190/kg (US\$2.81- 3.81) (Field Research, 2016). However, access to equipment for drying, such as solar dryers, is limited, despite some increases through cocoa revitalization programs.

4. GVC actors lack coordination. While there are a number of programs and initiatives underway to support the growth of the cocoa sector, these efforts not aligned. The lack of coordination occurs both among government actors as well as industry associations in the Philippines. Table 7 highlights the range of public stakeholders that are engaged in the industry.

Table 7. Key Stakeholders Engaged in the Cocoa-Chocolate GVC

Actor	Description	Role
Department of Agriculture (DA)	Public sector unit responsible for developing and implementing agricultural policy in the industry	Provides technical assistance and other support to smallholders in the country; carried out a road-mapping exercise for the cocoa industry in 2012
Department of Agriculture, High Value Crops Development Program (DA-HVCDP)	Program is designed to work closely with private sector, particularly smallholders and farmers	Through the provision of extension services, goals include food security, expansion of private sector investment and income as well as improved production techniques. Cocoa is a priority commodity
Department of Science and Technology (DOST)	Government agency that promotes and assists with, scientific and technological research and development in areas identified as vital to the country's development. It also facilitates technology transfer in the Philippines	Helps in research and development as well as the transfer of new production inputs and techniques to improve producer competitiveness via PCAARRD ³⁴
Department of Trade and Industry (DTI)	The Board of Investments, reviews and approves applications for investment incentives for the industry	Coordinating agency of technical working groups to overcome industry-binding constraints, DTI-Davao is leading implementation of the harmonized roadmap
CIDAMI	Local NGO that links private and government sectors, non-government organizations, and all cocoa stakeholders across Mindanao and expanding to rest of nation	Provide knowledge, technical assistance, and relevant key information to all value chain actors
ACDI/VOCA	International NGO focused on improving the livelihoods of poor in developing countries by connecting them with international markets	Lead of the MinPACT project focused on coffee, cacao and coconut.
Philippine Council for Agriculture and Fisheries (PCAF) Sub-Committee on Cocoa	Sub-committee of the DA that focuses on growing and promoting the cocoa industry by bringing together actors across the value chain	Convenes the private sector to discuss how to develop, recover, and grow the cacao industry through strategic policy interventions
CocoaPhil	Local NGO that links farmers, processors, buyers and others to promote integration and sustainable development of the cocoa sector	Provides data, technical assistance, technology promotion, and operates post-harvest centers as part of training program for farmers

Source: Authors

Government Coordination: The DA and the DTI are both undertaking efforts to strengthen the Philippines position in the cocoa-chocolate GVC; however, they do not have a united strategy to upgrade the sector. DA initiatives have been focused on improving production and DTI efforts have

³⁴ PCAARRD (Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development) is a council under DOST that formulates policies, plans, projects, and strategies for S&T development in the agriculture, forestry, aquatic and natural resources sectors

focused in the processing sector. With limited coordination duplications of effort or plans that are contradictory arise. Processors, for example, rely on imports from abroad due to lack of local production, which are often much cheaper than those in the Philippines. Attempts at collaboration exist, such as the recently harmonized road map, but disparate bodies continue to struggle to collectively promote the industry (Field Research, 2016).

Industry Association Coordination: Two major industry associations help coordinate the industry and link actors along the value chain: CocoaPhil and CIDAMi. Both were established in the recent resurgence of the industry but operate as separate entities.

In 2003, after a period of decline, the Philippine government secured a grant from USAID to organize the Cocoa Foundation of the Philippines (CocoaPhil) to reestablish participation in the sector (Field Research, 2016). CocoaPhil currently runs trainings and research for new end products for cocoa supplies. It also buys beans in its Cacao Agri-Business Zones located in Davao City, Compostella Valley and Zamboanga Del Norte. Beans are used for training and postharvest technology research via collaborations with the Department of Agriculture.

Following the establishment of CocoaPhil, the United States Department of Agriculture (USDA) funded the Success Alliance Project which sought to increase competitiveness in cocoa, coffee, and coconut by improving post-harvesting systems and handling practices. ACDI/VOCA, an international economic development organization with expertise in agriculture implemented the project in Mindanao. In addition to initiatives focused on increased value capture for farms by building solar dryers in cocoa farms, ACDI/VOCA also helped establish the Cacao Industry Development Association of Mindanao, Inc. (CIDAMi). CIDAMi, an advocate for the cocoa industry in Mindanao, convenes actors along the value chain to increase the competitiveness of Mindanao in cocoa. It is now expanding outside of Mindanao (Field Research, 2016).

The goal of both groups is to harness its convening power to grow the cocoa industry. However, they often do not collaborate, creating inefficiencies in the industry. Furthermore, without a unified plan, duplication and inconsistencies arise. More coordination between the actors would help create efficiencies.

4. Upgrading: Lessons for Philippine Upgrading from Global Experiences

In order for the Philippines to successfully establish a position for itself as an integrated player in the cocoa- chocolate global value chain, it needs to upgrade its current operations in the industry. By adopting new technologies, producing a new product or engaging in an entirely new set of activities, upgrading can also allow actors in the GVC to capture greater value from their participation (Humphrey & Schmitz, 2002). In agribusiness chains such as cacao, this can be achieved in a number of different ways; for example, by improving the agro practices to cultivate cacao; introducing new technologies such as irrigation; or moving to processing stages of the chain such as cocoa liquor and cocoa butter. Due to the growing sustainability challenge in the industry, process upgrading in the agricultural production segment – that is increasing productivity has been a central challenge for most countries. International demand is high and cacao-producing countries all have in place special programs to increase agricultural productivity. These programs are not only led by country governments, but also by firms and NGOs. Table 8 summarizes the key upgrading trajectories that have typically been pursued by countries in the cocoa GVC.

Table 8. Selected Upgrading Strategies in the Cocoa-Chocolate GVC

Upgrading Trajectory	Description
PROCESS UPGRADING (AGRICULTURE)	Primarily focused on increasing the quantity of beans harvested from the trees. Replacing aging trees can considerably increase production; improved fertilizer and irrigation techniques, pruning and weed control as well as shade coverage can also all boost production. Achieving this upgrading requires access to training to familiarize producers with new production methods and affordable finance to support the integration of new techniques into the production operations.
	<i>Example.</i> In 2012, ten of the leading cocoa processors and chocolate brand manufacturers (developed country firms) agreed on sharing GAPs to meet growing demand and address declining productivity. Mondelez International, the world's largest chocolate manufacturer, has committed US\$400 million to cocoa sustainability programs in six nations: Ghana, Cote d'Ivoire, Indonesia, the Dominican Republic, India, and Brazil; the goal is to work with as many as 200,000 cocoa farmers by 2022. <i>Example.</i> Between 2009 and 2012, several companies together with CONACADO, the national confederation of cocoa producers in the Dominican Republic launched an initiative to increase productivity via the rehabilitation and rejuvenation of cocoa plantations. Even before new plants reached maturity, the introduction of organic fertilizer, weeding and pruning had boosted output by up to 77%, increasing productivity to competitive global levels (Fernandez-Stark & Bamber, 2012).
PRODUCT UPGRADING (AGRICULTURE)	Shifting into the production of fine cocoa beans; these include replacement of regular varieties for higher value 'fine' cocoa variety as well as improving the quality of production of regular cocoa beans. These cocoa beans yield higher returns on average than commodity cocoa beans.
	<i>Example.</i> Capitalizing on the growing demand for premium chocolate, Ecuadorian farmers shifted production to fine or flavored cocoa beans, known as cocoa Arriba. Because of its high quality and unique taste profile it is able to obtain above market prices and is used in niche chocolate manufacturing. In 2012, the government established a national program dedicated to increase yields via industrialization and increased production. It now supplies over 65% of all Arriba cocoa consumed globally (Nestle, 2012).
INITIATION OF ORIGIN GRINDINGS: FUNCTIONAL UPGRADING	Installation of roasting and grinding operations, allowing for in-country intermediate processing and value addition to cocoa beans. Traditionally, cocoa beans have been harvested, fermented and dried before being shipped in bulk to processing facilities in developed countries. Increasingly, cocoa producing countries are providing primary processing before shipping. On average, over the past ten years, the value of 1kg of cocoa paste exports has been 16% higher than the value of 1kg of cocoa beans.
	<i>Example.</i> In Cote D'Ivoire, the government instituted tax incentives for grinders to establish operations in the country in the 1990s; these were in place for 20 years until 2012 (Monnier, 2015). By 2016, 12 grinders with 720,000T of capacity were operating locally, of which market leaders Barry Callebaut, Olam International, Cargill and Cemoi are the largest (Aboa & Kpodo, 2016). New policy initiatives include tax-incentives for grinders expanding their capacity, and a secondary market limiting access to the mid-crop to locally based grinders to improve their competitiveness (Monnier, 2016). In addition, the country is implementing export taxes on unprocessed and early-processed products to try and drive upgrading into even higher stages of the chain (Monnier, 2016). The country aims to process 50% of the country's output by 2020.
COCOA BUTTER PRODUCTION: FUNCTIONAL UPGRADING	Initiation of the production of cocoa butter. This mid-stream value chain activity adds value to intermediates in the cocoa-chocolate global value chain. Adding pressing functions require a high investment in sophisticated equipment, skilled labor to run and manage the machinery. It also consumes high levels of energy.
	<i>Example.</i> Indonesia became the world's third largest producer of cocoa beans during the 1980s and 1990s. In 2010, the government led an initiative to add value to production by implementing an export tax on unprocessed beans of between 5-15% depending on the world prices. Between 2009 and 2012, processing capacity doubled; investors included domestic and regional grinders. Subsequently, global processors Barry Callebaut and Cargill made large-scale investments in grinding and cocoa butter operations in the country, and began to link these with industrial chocolate operations supplying Indonesian food and beverage manufacturers serving the domestic and regional markets (Barry Callebaut, 2016b; Cargill, 2014). In 2010, the country exported US\$260 million in cocoa butter and after the export tax on unprocessed beans, the cocoa butter exports increased to almost US\$800 million in 2015.

Source: Duke CGGC.

The potential upgrading trajectories open to a country at any one time, however, depend on the country's specific position in the value chain, a wide range of institutional factors, including infrastructure, the business environment, and trade and investment policy and importantly, the

governance structure of the chain (Bamber et al., 2013; Gereffi et al., 2005). For example, functional upgrading- incorporating additional functional activities of the chain (e.g. moving into roasting or branding activities), while a highly sought after trajectory by developing countries, is often difficult for them to pursue because there tend to be higher barriers to entry in the higher-value stages of GVCs due to higher capital, skill and raw material requirements on the supply side and concentrated markets on the buy side. In developing countries, product and process upgrading can be more attainable as short to mid-term goal since they often require relatively minor investments in skills, equipment, or adjustments to the production process. In analyzing different prospective paths to upgrading in the cacao industry that could be pursued by the Philippines, it is therefore useful to look more in depth at specific country examples from countries at similar levels of development and facing similar questions of how to upgrade in the cocoa-chocolate GVC.

The upgrading experiences of two countries, Ecuador and Indonesia, are thus examined. Each represents a successful case of the principal upgrading trajectories followed in the industry. Ecuador represents a case of process and product upgrading. Beginning in the 2000s, the nation improved productivity in cocoa beans. It also began focusing on higher value production, including single origin chocolate of fine flavor cocoa beans to increase value addition. Indonesia, on the other hand, represents a case of functional upgrading. Through policy interventions, Indonesia is promoting the move from exporting cocoa beans to processing beans in country. Both Ecuador and Indonesia offer insights for the Philippines on how to upgrade in the cocoa-chocolate GVC. Table 9 highlights key indicators in the industry for each nation.

Table 9. Selected Indicators Related to the Cacao Sector in Ecuador, Indonesia, and the Philippines

Indicator	Ecuador	Indonesia	Philippines
GDP/Capita (2015, Current US\$) World Bank	US\$6,205.10	US\$5,814.80	US\$2,904.10
Cocoa Bean Production Volume (2014/2015) (ICCO)	250,000 MT	325,000 MT	No data
Cocoa Bean Exports Volume (MT, 2015) (UNComtrade)	220,286	58,297	1,912
Primary Export Product (2015) (UNComtrade)	Cocoa Bean	Cocoa Butter	Chocolate
Cocoa Bean Exports (US\$, 2015) (UNComtrade)	694,130,613	180,339,289.00	5,843,016
Unit Value Cocoa Bean Exports (US\$/kg) (UNComtrade)	US\$3.15	US\$3.09	US\$3.06

Source:(ICCO, 2016b; UNComtrade, 2016; World Bank, 2016)

4.1 Ecuador—Increasing Value by Process and Product Upgrading

In 2015, Ecuador was the 3rd largest exporter of cocoa beans in the world by value and 4th largest in volume, exporting 220,300 tons (UNComtrade, 2016).³⁵ It is currently the largest exporter in Latin America, surpassing traditional export markets in the region such as Brazil, Peru, and Colombia (USDA, 2015). Cocoa beans are a key contributor to export revenue, and represent approximately 4% of the country's total exports (UNComtrade, 2016). Ecuador is the world's largest producer of "fine or aromatic" cocoa, and accounts for about 60% of global exports of this higher value crop (Hernández et al., 2014).

Ecuador's participation in the cocoa-chocolate GVC is almost exclusively as an exporter of cocoa beans. Of the estimated 255,000 tons produced in 2015, approximately 88% were exported as fermented and dried (USDA, 2015). Only 12% is processed domestically and the grinding capacity in the country is very small. Just 2% of cocoa goes into chocolate production and only 1% of that chocolate is exported (Bain & Company, 2015). Like the Philippines, cocoa production can occur in almost all parts of the country, with the exception of the highlands area (Kooij, 2013). Furthermore, production of cocoa occurs on small and middle-sized farms (Nestle, 2017). Smallholders produce about 90% of Ecuador's total cocoa bean output. On average, these smallholders cultivate 2 ha/farm in the mountains and 10 ha/farm at the coast (Cepeda et al., 2013).³⁶

Ecuador's upgrading in the cocoa-chocolate GVC can be divided into two key trajectories: (i) Process Upgrading: increased productivity of cocoa beans; and (ii) Product Upgrading: focus on higher quality to increase selling price. As part of its focus on increased productivity and quality, Ecuadorian farms are pursuing several certifications for sustainability. The country is also seeking denomination of origin certification for the "Arriba" variety of coca bean, as well as for single source cocoa. These branding efforts, although still pending their outcomes, will support the country's product upgrading. The two trajectories Ecuador followed to increase competitiveness are examined in further detail below.

(i) Process Upgrading for Increased Productivity: Production in Ecuador has been consistently increasing since 2008 (USDA, 2015). Production increased 154% from 2008 to 2014, growing from 94,300 to 240,000 tons (USDA, 2015). Exports also rose in this time period (see Figure 13); increasing by approximately 363% in value and 154% in volume between 2005 and 2015 (the largest gains occurred after 2010) (UNComtrade, 2016). Increases in production, and consequently exports, reflect the results of several different programs, although two stand out - the National Cocoa Plan, and Nestlé's Cocoa Plan. These programs worked closely with small and medium farms to replace older plantations with lower productivity and expand production areas while simultaneously improving quality (Cepeda et al., 2013; USDA, 2015).

In addition, there has been a drive towards international certification, that has helped promote sales and capture value, as well as improve the sustainability of the industry. Ecuador is working on increasing the amount of certified growers in the country to match global demand for sustainably sourced cocoa (Potts et al., 2014). In 2012, it supplied 2% of the world's certified cocoa beans and 5% of the world total supply of cocoa (Potts et al., 2014).³⁷ The promotion of certification among

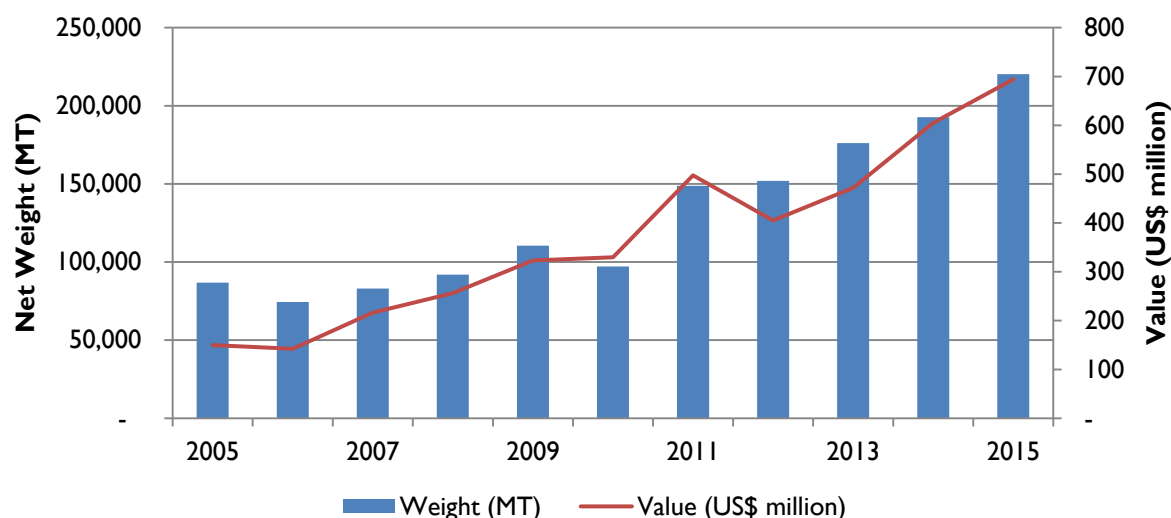
³⁵ This represents 115 times more export volumes than the current Philippine exports.

³⁶ Middle-sized farms, by comparison, are 11 to 50 ha in size and employ hired labor.

³⁷ By comparison, Cote D'Ivoire, the largest exporter of beans in 2012 accounted for 50% of all certified cocoa beans. Indonesia, the third largest exporter supplied 4% of all certified cocoa beans exported (Potts et al., 2014).

producers reflects the shift among global chocolate manufactures for sustainably sourced cocoa beans. By 2012, it was estimated that 15%-20% of the cocoa produced in Ecuador was certified under one or more of the voluntary sustainability initiatives: Organic, Fair Trade, UTZ, and Rain Forest Alliance (Larrea & Lynch, 2012).

Figure 13. Ecuadorian Cocoa Bean Exports, 2005-2015



Source: UN Comtrade based on HS codes 1801. Retrieved on October 25, 2016.

(ii) *Product Upgrading: Focus on High Quality Cocoa Beans*: Increased production in the country was complemented by a focus on fine flavor cocoa beans. Today, the country produces mainly two types of medium and high quality beans: *Arriba*,³⁸ a Forastero clone and the *Colección Castro Naranjal* (CCN-51), a Forastero-Trinitario hybrid. *Arriba* cocoa beans represent 37% of national production while CCN-51 accounts for 36% of national production (USDA, 2015). *Arriba* beans have a special designation of fine or flavor cocoa beans, referring to their unique taste profile and are used for premium quality chocolate production (ICCO, 2017a). In Ecuador, the National Institution of Standards (INEN) sets standards regarding the quality of cocoa beans. It has classified cocoa beans into 5 classes, corresponding to quality standards as well as other factors, including the size and weight of the bean, as well as post-harvesting techniques (Kooij, 2013).

Improved production techniques incorporated in process upgrading helped to maintain the quality levels through harvesting and post-harvest fermentation and drying. The result of the focus on producing fine flavored beans is a 59.3% growth in per unit value from 2005 to 2015, with the unit price of exports increasing from US\$1.73/kg in 2005 to US\$3.15 in 2015 (UNComtrade, 2016).

Together, process and product upgrading have helped to boost overall export value and volume of cocoa beans in Ecuador. Export volume has increased 2.5 times, while exports value has increased 4.3 times by more than half a billion dollars (UNComtrade, 2016). The following section looks at the programs and policies that helped to grow the industry in Ecuador.

³⁸ Also known as “National”.

Policies and Programs for Upgrading

Ecuador's current position in the cocoa-chocolate GVC is the result of specific policy interventions to build the industry lead by the government, private sector and NGOs. Key actors include the Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP), which facilitates, regulates and manages agricultural production; the Ministry of Industry and Productivity, Ministry of Foreign Relations, Trade, and Integration, and ProEcuador which manages industrialization and export promotion; the National Institution of Standards (INEN) which controls the quality of cocoa beans; and a number of associations that promote the development of cocoa including the National Association of Cocoa Exporters (ANECACAO), the largest association that represents exporters. ANECACAO provides a range of services including industry data, technical assistance, marketing of Ecuadorian cocoa, and provides policy advice. These organizations work together with private sector actors, including cocoa bean aggregators, exporters and a handful of processors to direct the industry.

Table 10 highlights several major initiatives used to drive growth in Ecuador. Increased production is the result of a combination of government and private sector programs that sought to increase plantings, improve farming techniques and to boost the sustainability of the industry. At the same time, other programs sought to increase the quality of harvests and to capitalize on the unique cocoa bean varieties grown in the country to capture higher values. The main goal of each of these initiatives is to promote Ecuador's cocoa. The National Cocoa Program served as an umbrella program to help coordinate production activities for cocoa bean export, while other programs focused on production of the *Arriba* bean or product upgrading through improved quality and branding.

Table 10. Major Policies in Ecuador's Cocoa Industry

Initiative	Year	Description
National Cocoa Program		<ul style="list-style-type: none"> To establish links with organizations working towards the commercialization in cocoa such as: INIAP (Investigation), MAGAP (Production), MIPRO (Industrialization), IEPI (Denomination of Origin) and MRECI-PROEcuador (Promotion of exports and commercial protection)
National Program of Fine Aroma Cacao		<ul style="list-style-type: none"> To position Ecuador as the leading producer and exporter "Cocoa <i>Arriba</i>" Increase sustainable production, productivity and export of '<i>Arriba</i>' cocoa Develop and implement efficient quality processes in the value chain. Promote national industrialization and "Cocoa <i>Arriba</i>", and promote domestic consumption. Increase international market share and diversification
Abidjan Cocoa Declaration		<ul style="list-style-type: none"> Ecuador signed the declaration to improve sustainable cocoa economy
Geographical Indication (PGI) Status for ' <i>Cacao Arriba</i> '		<ul style="list-style-type: none"> Applied to the EU commission Part of negotiations to add Ecuador to an existing trade agreement between EU member states and Colombia and Peru

Source: Adapted from Ahmed and Hamrick (2015).

(i) *Process Upgrading for Increased Productivity*: The most notable push for process upgrading occurred under the National Cocoa Program in 2013, which helped coordinate efforts in the industry. This plan involves the participation and coordination of key stakeholders in the value chain, from cocoa producers to cocoa processors, including also R&D and other government agencies. The overarching goal of the plan was to promote cocoa production by working with agencies along the value chain to steer the industry towards larger scale production and export. Specifically the program sought to increase farm level interventions to improve farming practices, such as pruning, in order to meet export requirements (Freire, 2013).

In addition, Ecuador is promoting policies that support sustainability initiatives in the country. To accomplish this aim, the country established several initiatives. For example, as part of the National Program of Fine Aroma Cacao, in 2012 the government led a cocoa pruning campaign. The program sought to expand planting of cocoa trees to new areas, replant trees in aging farms, and implement new farming protocols to increase existing production. Pruning, an essential task to maintain high yields and sustain productivity of trees, was especially encouraged through the program. The government partnered with over 500 producer associations to help the estimated 30,000 smallholders in the nation increase pruning of cocoa trees. A total of approximately 19 million cocoa trees were pruned during the program (Freire, 2013). At the project close, over 60,000 ha of new plantations were established, with 284,000 ha receiving improvements and 600 production protocols distributed to various farmer associations in the country (Freire, 2013). Additionally, programs helped to promote sustainable farming practices including proper use of fertilizer and other farm techniques to help promote sustainability.

Beyond government-sponsored programs, private sector initiatives are also facilitating process upgrading. In 2011, Nestlé implemented its sustainability and growth program, Cocoa Plan in the country. The plan seeks to improve traceability from cocoa bean farmer to consumer and facilitate certification for sustainability (Nestle, 2012). It also provides technical assistance on best practices for farmers on all farm level activities, from seed planting and tree maintenance to harvesting and fermentation of beans (Nestle, 2017) and providing no interest loans and inputs to farmers (Nestle, 2017). The program has allowed over 380 farms become UTZ certification in Ecuador (Nestle, 2012).

(ii) *Product Upgrading: Focus on High Quality Cocoa Beans*: Ecuador's increased participation in the cocoa-chocolate GVC is also through a focus on quality. The *Arriba* cocoa bean is recognized by the International Cocoa Organization (ICCO) as a fine or flavor bean, commanding higher prices compared to other bean varieties and being well suited for premium chocolate production (ICCO, 2017a). The government has taken many steps to help brand *Arriba* beans as unique, and safeguard their position on the global market.

The government is investing over US\$80 million in the next 10 years for development of fine flavor cacao in the country (Cepeda et al., 2013). Money designated for fine flavor cocoa aims to maintain and expand its position as global supplier of the fine flavor cocoa. In 2015, Ecuador accounted for 2/3 of the global supply and hopes to increase its production (Nieburg, 2015a).

In 2011, the government established the Association of Producing Countries of Fine Aroma Cocoa (FINACAO) along with other countries in the region who produce fine flavor cocoa.³⁹ It is

³⁹ Other member nations include Bolivia, Colombia, Costa Rica, Nicaragua, Peru and Venezuela.

headquartered in Ecuador. The objective of the organization is to build capacity among small and medium size producers to help them capture higher value and sustainably cultivate fine flavor cocoa through improvements in harvest quality and international cooperation (Kooij, 2013).

The government is also seeking to distinguish *Arriba* cocoa from other cocoa beans to capture higher value. In 2005, the Ministry of Agriculture declared *Arriba* cocoa beans a “Product Symbol of Ecuador,” affirming the importance of cocoa in the nation (ANECACAO, 2015). Subsequently, the government sought denomination of origin protection for the *Arriba* bean. As part of trade negotiations between the EU, Ecuador, Colombia, and Peru, Ecuador sought to achieve a Protected Geographical Indication (PGI) Status for its *Arriba* bean. PGIs are labels that convey quality to consumers by linking it to the geographic regions of production (WIPO, 2015). Once designated, countries agree to only allow products from the PGI region to carry the name.

4.2 Indonesia—Increasing value by Functional Upgrading and Process Upgrading

Indonesia has a long history in the cocoa-chocolate GVC. Production occurs in several islands in the nation, with 65% of cocoa plantations in the island of Sulawesi and another 15% in Sumatra (Taylor, 2012). With major pushes for cocoa beans beginning in the 1980s (Neilson & McKenzie, 2016), Indonesia quickly became an industry leader, and has been one of the top global exporters of cocoa beans, behind Cote d’Ivoire and Ghana for much of the recent past (Indonesia Investments, 2017). Cocoa bean exports grew steadily until 2010, peaking at 535 million tons in 2007. Export value also increased, topping US\$1 billion in 2010 (UNComtrade, 2016).

Starting in 2010, as a result of stable cocoa bean supply and government policies, the nation began to upgrade into cocoa processing. Following the introduction of a tax on cocoa beans exports and imports in April 2010 to encourage the processing of the beans in the country (GBG Indonesia, 2014), exports of cocoa beans declined from over US\$1 billion to just US\$180 million in 2015 (UNComtrade, 2016). During the same period, the country saw substantial increases in the export of cocoa liquor/paste and cocoa butter, indicating an upgrading trend towards processing in the country. More recently, efforts to improve farming techniques and replace aging trees to help increase the supply of cocoa beans have been undertaken. Many large multinational cocoa processors are expanding or entering the nation, citing perceived long-term growth in cocoa bean supply for the nation and increasing regional demand for chocolate as major drivers of their investments (Nieburg, 2015b).

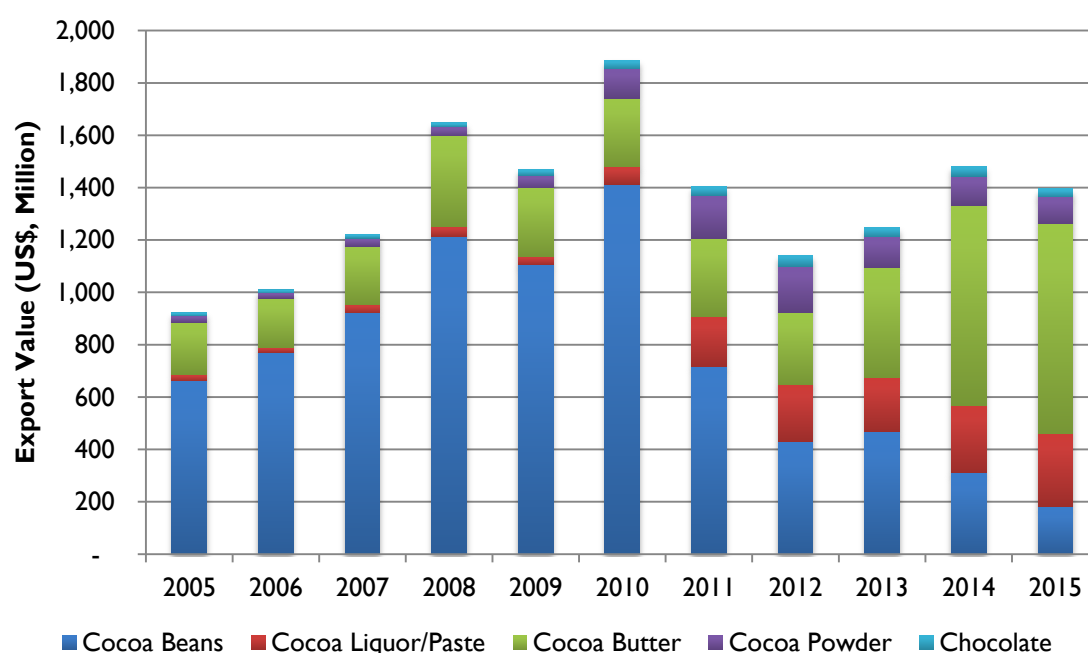
Indonesia’s upgrading from a global supplier of cocoa beans to exporting semi-processed cocoa products is the result of two key trajectories: (i) *Functional upgrading*: spurring domestic processing via export taxes on domestic cocoa beans and (ii) *Process upgrading*: farm level interventions by both the public and private sector to increase productivity and replace aging trees. These are examined in further detail below:

(i) *Functional upgrading via export and import taxes on cocoa beans*: Similar to Cote d’Ivoire and Ghana, Indonesia leveraged its strong role as a leading producer and exporter of cocoa beans to upgrade into processing. Following a strong history of cocoa bean exports, the nation entered into a new phase of the cocoa-chocolate GVC, semi-processed cocoa product exports.

The move from cocoa bean to the export of semi-processed cocoa products (see Figure 14) highlights the functional upgrading path Indonesia is taking to increase competitiveness in the

sector.⁴⁰ During this time, export value increased for both cocoa liquor/paste and butter. Cocoa liquor/paste exports increased nearly tenfold, from approximately US\$25.5 million in 2005 to US\$281 million in 2015. Cocoa butter exports rose from US\$198.5 million to almost US\$800 million in 2015, representing a growth of over 300% (UNComtrade, 2016). They also grew in export volume. Cocoa liquor/paste increased from just 4% of total export volumes to 28.2% in 2015. Cocoa butter grew from 8.3% to 39.8% of export volume in the same time period (UNComtrade, 2016). This was driven by a significant increase in grinding capacity, which doubled between 2010 and 2015 reaching 370,000MT (see Table 11) (ICCO, 2016b). Cocoa bean grinding increased 95% from 2010 to 2015, growing from 190,000MT in 2010 to 370,000MT in 2015 (ICCO, 2016b). Similarly, export volumes for cocoa butter and paste also grew by approximately 358% and 208% respectively.

Figure 14. Indonesia's Exports by Cocoa-Chocolate GVC Segment, (US\$ million) 2005-2015



Source: UN Comtrade based on HS codes 1801, 1803, 1804, 1805, & 1806. Retrieved on October 25, 2016.

Cargill, Barry Callebaut, JB Cocoa and PT Bumitangerang Mesindotama all have multi-million dollar investments in grinding operations in Indonesia (Taylor & Supriatna, 2014).⁴¹ Several of these firms are increasing investment. For example, Cargill, which first began cocoa operations in 1995, invested in a new US\$100 million cocoa processing plant in 2014 citing estimated cocoa bean supply from the nation (Indonesia Investments, 2015). The plant will have an initial capacity of 70,000 tons a year and will source beans from Sulawesi (Indonesia Investments, 2015). Additionally, Barry Callebaut invested in new cocoa processing and chocolate manufacturing operations in the country (Barry Callebaut, 2016b; Taylor, 2012).

⁴⁰ See Appendix for Export Volume data (Figure A-3) and Export Unit Value (Table A-3).

⁴¹ JB Cocoa is a Malaysian based processing firm that entered Indonesia in 2015. PT Bumitangerang Mesindotama is an Indonesia based multinational with operations in over 50 nations.

Table 11. Indonesia's Cocoa and Grinding by Volume (MT), 2010-2015

Year	Production (MT)	Grinding (MT)
2010	440,000	190,000
2011	440,000	270,000
2012	410,000	255,000
2013	375,000	340,000
2014	325,000	335,000
2015	330,000	370,000

Source: (ICCO, 2016b)

(ii) *Process Upgrading via farm-level interventions*: While processing was boosted, the share of total export volume of cocoa beans in the Cocoa-Chocolate GVC for Indonesia declined dramatically, from 83% in 2005 to 15% in 2015 (UNComtrade, 2016) as raw material shifted towards local processing. The volume of cocoa bean exports dropped from 486,000 tons in 2005 to 58,000 tons in 2015 (UNComtrade, 2016). Export values for beans dropped nearly 73% despite more than doubling in per unit value from US\$1.36 to US\$3.09 (UNComtrade, 2016). While processing played a central role in this reduction of exports, the country also experienced a decline in production. Between 2010 and 2015, production declined from 440,000 tons to 330,000 tons (ICCO, 2016b). Like other cocoa producing nations, output from mature cocoa trees is tapering off and farmers are moving to other crops (Neilson & McKenzie, 2016). As a result of these production challenges, the supply of cocoa beans declined, which strains the country's productive capacity and spurred programs to increase domestic supplies (GBG Indonesia, 2016). In an effort to reduce import dependency and to spur local production, the Indonesian government began collaborating with farms and the private sector to increase yields in the country.

Like many nations, including the Philippines, smallholders account for 95% of all production area of cocoa beans.⁴² The remainder of the land is state-owned or held by private firms. The majority of cocoa trees in the nation are aging, with most planted in the 1980s. As a result, many were increasingly susceptible to diseases that threaten yields (Taylor, 2012). This was further complicated by the use of poor farming techniques among many smallholders. As a result of these challenges new programs to improve yields and promote production have been launched in recent years. These programs seek to encourage planting of new seedlings, increased fertilizer use and investments in irrigation and machinery for farms. Recent collaborations between farmers and large processors and chocolate manufactures, such as Mars, are also addressing these challenges via programs that promote knowledge transfer to farmers.

Policies and Programs for Upgrading

After achieving a stable and large supply of cocoa beans domestically, several approaches by both the government and private sector helped spur upgrading in the nation. Through taxes and inspection requirements for cocoa beans, the government helped to incentivize movement into the processing segments of the GVC. At the same time, it sought to continue to bolster production and address concerns of declining productivity. This was met with a simultaneous push by private sector processors and manufacturers in the nation who began working more closely with farmers to help safeguard supplies of cocoa beans and meet the growing global demand for certification.

⁴² Smallholder production occurs generally on farms smaller than 2 Ha (Neilson & McKenzie, 2016).

(i) *Functional upgrading via export taxes and government promotion.* The functional upgrading from the export of unprocessed beans to cocoa liquor/paste and cocoa butter is the result of policies to encourage processing of domestic cocoa beans to increase value addition. In 2007, functional upgrading into cocoa processing was identified as a priority for the country. The government included cocoa processing as one of its 6 agri-based sectors to promote abroad to attract investors. It began this with a series of tax incentives and tax holidays for up to 6 years to attract processors (Johnson, 2011). In particular, in April 2010, the Indonesian government introduced a progressive tax on all cocoa bean exports. The goal was to redirect local supply to processing in an attempt to move into higher value activities along the value chain. The tax, reported at 10% in June 2016 (Nangoy, 2016) can rise to a maximum of 15% (GBG Indonesia, 2014).

Beyond taxes, in 2014 the government announced the creation of a special economic zone (SEZ) in Palu, on the cocoa producing island of Sulawesi (BKPM, 2017). In addition to the strategic location on a major cocoa producing island (65% of nation's total), the SEZ also is located close to a major port with easy access to neighboring markets, including the Philippines and Malaysia (BKPM, 2017). The SEZ focuses on agri-processing and includes cocoa processing. It offers tax allowances and VAT exemption as well as supporting infrastructure needed to be competitive (BKPM, 2017).

(ii) *Process Upgrading via farm-level interventions.* Increased productivity and cocoa bean supply is needed to both supply the country's new host of processors and to reduce Indonesia's exposure to volatile global cocoa bean prices (GBG Indonesia, 2014). At approximately the same time the country began fostering upgrading into processing, the government began to focus on increased harvesting through farm level programs. The National Cocoa Rehabilitation program was the first government program addressing productivity, and focused on harvest intensification via increased fertilization and planting of seedlings to replace aging trees (Neilson & McKenzie, 2016). Investments in the program reached over US\$350 million (GBG Indonesia, 2014). The program attempted to encourage farmers to adopt modern agriculture practices, by distributing free fertilizer (Taylor & Supriatna, 2014). However, some noted the program suffered from poor quality planting material and the absence of trained technical support for farmers (Neilson & McKenzie, 2016). As a continuation of the program, the government announced in 2014 it would seek to continue improvements of planting material and fertilizer use while also investing in irrigation and machinery on farms (Indonesia Investments, 2015).

In addition to supporting productivity growth, the government imposed a tax on imported cocoa beans, in addition to requiring strict quality regulations including laboratory inspection for contamination to help boost demand for local beans. According to the Indonesian Cocoa Industry Association, the total cost of import duties and tax amounts to roughly 17.5% (Munthe, 2016). Farmers, see the import tax as a way to promote use of domestic beans and encourage continued cultivation of the crop (GBG Indonesia, 2014).

Cooperation with local farms as a strategy to improve bean production and advances the competitiveness of in-country processors is also a priority for MNCs in the country. With increased demand for sustainable certifications globally, the private sector is now working directly with farmers to increase yields in sustainable ways. Certification typically follows a top-down approach in the nation where farmers are trained by exporters and processors on compliance with requirements.

In addition, the government has also partnered with several MNCS, especially large processors and chocolate manufactures. Mondelez's Cocoa Life (see Box 1) expanded programs into the nation focusing on improving the productivity of farms. Box 6 details how Mars is increasing collaboration with farmers using centralized knowledge centers to diffuse knowledge. Additionally, Barry Callebaut has several sustainability initiatives in the country including programs to increase the number of cocoa farmers trained in good agriculture practices from 20,000 to 50,000 by 2020 (Bamford, 2016). The company is also increasing the number of cocoa nurseries and more than doubling the premiums paid for certified cocoa beans to promote more sustainable harvesting (Bamford, 2016). It is currently increasing the number of field staff to coordinate programs.

Box 6. Mars Participation with Cocoa Farmers in Indonesia

Mars is encouraging productivity increases with the establishment of Cocoa Development Centers (CDCs) in the nation to help diffuse knowledge of sustainable modern farming practices. As of 2014 there were 4 centers in the nation with plans to add 16 additional CDCs by 2017. CDCs offer hubs for technology demonstrations and trainings on best practices in cocoa for farmers. They connect to farmers via cocoa village clinics (CVCs), rural enterprises that are self-sustaining operations. CVCs work directly with farmers providing extension services and trainings and selling inputs. They are supported by the Mars funded Cocoa Academy, a centralized training institute in good agricultural practices and business management. CDCs are operated by processors and overseen by farming experts in the community. They support rural enterprises seeking to increase participation in the cocoa sector. The strength of CDCs is their ability to network and provide incentives for actors across the value chain from farmers to processors and manufacturers.

Source: (Neilson & Mckenzie, 2016).

4.3 Key Lessons for the Philippines

Countries around the world compete fiercely for upgrading in GVCs, the cocoa-chocolate value chain is no exception. Governments, firms and civil society organizations push and create programs and policies to encourage the industry upgrading.

The cases presented above offer examples of how two particular countries are moving up in the value chain. One of the most important upgrading that Indonesia and Ecuador are pursuing is process upgrading at the agricultural level. This is a response to the global trend in which cocoa production has remained constant in the past 10 years while demand continues increasing. Almost all producing countries are implementing policies and programs to boost productivity. Thus, in order to effectively participate in the cocoa-chocolate value chain, the minimum requirement for developing countries is to have a stable and larger supply of cocoa. Nations that are able to increase their cocoa production will be able to upgrade and move to other segments of the value chain.

While both Ecuador and Indonesia have focused on increased productivity, they have different reasons for doing so. In the case of Ecuador, the policies have focused on increasing export gains through increased productivity and quality. This can be seen in the boom of cocoa beans exports. The exports of cocoa beans in the country increased almost three times, a very rare phenomenon in an industry where production is almost stagnant. The nation also sought to diversify beans in country to enter traditional and niche markets. Indonesia presents a different approach; the country is implementing policies to boost production in order to have sufficient raw materials to support its

newly installed processing capacity. In an industry in which the main raw material is scarce, it is increasingly important for countries to make sure they produce internally to supply the processing stages that the country aims to pursue. Thus, if the Philippines seeks to participate in the cocoa-chocolate value chain, it must focus on expanding and improving the agro production of cocoa beans.

The second level of upgrading differs in Indonesia and Ecuador. The Latin American country decided to upgrade improving and taking advantage of the quality of its bean. Ecuador was able to double the price of its beans in the past decade focusing on a niche market of fine cacao that is highly demanded in European countries. Therefore, Ecuador upgrading story has been focusing in excelling in agricultural production to supply more and better quality cocoa beans to the world. It also sought to establish diverse marketing channels for various beans to help capture value from niche markets while still participating in traditional cocoa bean chains.

On the other hand, Indonesia's second level upgrading emphasizes the processing stages of the cocoa chocolate value chain. The country increased the value of its exports by locally processing the cocoa beans produced domestically through a multi-stakeholder approach led by the government that implemented taxes to encourage the manufacturing of the beans. It further spurred the shift to processing via the establishment of SEZ with an agricultural processing focus on islands with high levels of cocoa bean production. Five years after the policies were established, the country increased their exports of cocoa liquor four times and exports of cocoa butter increased three times. It is also important to highlight that the country established an import tax on cocoa beans to disincentive the import of the raw material in order to encourage the processing of local beans.

5. Upgrading Trajectories Recommendations

Typical upgrading trajectories around the world in the agro-processing sector follow a linear path, in which once there is a stable and competitive production of the crop then the nation move to the processing stages (manufacturing) of the chain (Fernandez-Stark et al., 2012; Lee et al., 2012). This section outlines potential upgrading trajectories for the Philippines in the short and medium term. Short term, the nation should focus on improving production in volume and quality. Once this is achieved, it can move into higher value processing segments of the value chain.

1. **Short Term Process Upgrading (agriculture):** Taking the lead from major cocoa bean producers, the Philippines needs to improve their agriculture production to be competitive and participate in the cocoa-chocolate GVC. The starting point for the country is to expand and improve the productivity. Aging trees, and inefficient agricultural operations have undermined productivity of the sector. Increasing the production can first satisfy the domestic market and later the international market. This should be the very first step that the country should follow. Efforts to boost processing at this stage will likely drive less expensive beans imports from other countries, and undermine production efforts at home.
2. **Short Term Process Upgrading (certification):** Taking the lead from major cocoa bean producers, the Philippines needs to seek certification from the international certifying organizations, such as UTZ and Rainforest Alliance. While these certifications do not command a high price premium in the market, the commitment of several global cocoa processors and chocolate manufacturers to source only certified beans by 2020 represent a

potential shift in the global demand market and new requirement for export. The Philippines needs to begin assisting farmers now to meet the requirement of these organizations to ensure competitiveness as production increases.

- 3. Short Term Product Upgrading:** Continue to encourage the diversification of cocoa bean variety in the nation. Since the geography of the Philippines allows for the cultivation of the three major types of beans: Trinitario, Criollo and Forastero, it is advisable that the country can diversify risks by having all varieties that can go to different end markets. The majority of attention should go towards diversifying into Forastero beans as demand for Criollo beans is a niche market with relatively small demand. Furthermore, it is advisable to explore high value hybrids to take advantage of new markets and new cocoa bean varieties.
- 4. Medium Term Functional Upgrading (manufacturing):** Once the country is able to meet the minimum requirements of cocoa production, manufacturing of the beans will be the next step. As other lead countries such as Ghana, Cote D'Ivoire, and Indonesia have attracted investment from big processors once they secured a good and stable production volume. Olam, Cargill and Barry Callebaut are present in these countries having state-of-the-art factories and training specialists to run these cocoa plants that produce cocoa liquor and butter. Thus, this functional upgrading, moving to higher stages of the value chain will provide additional exports revenue and also new jobs for the country.

6. Appendix

Table A- I. Imports by GVC Segment for Select Asian Nations, 2011-2015

Segment	Export Value, US\$, millions					Global Market Share				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Cocoa Beans										
China	120.9	86.7	113.3	106.4	91.5	1%	1%	1%	1%	1%
Indonesia	62.9	63.0	77.4	341.4	--	1%	1%	1%	4%	--
Japan	193.3	158.1	109.1	101.5	138.1	2%	2%	1%	1%	2%
Malaysia	1007.5	877.5	764.5	916.8	692.0	8%	10%	10%	10%	8%
Philippines	1.1	.4	.6	1.7	.9	0.01%	0.004%	0.007%	0.018%	0.010%
Thailand	64.2	55.5	41.9	57.0	49.4	1%	1%	1%	1%	1%
Vietnam	--	--	--	--	--	--	--	--	--	--
World	12334.5	8404.6	7871.4	9511.8	8920.3	--	--	--	--	--
Cocoa Liquor/Paste										
China	100.2	83.9	89.4	94.3	92.3	3%	3%	3%	3%	3%
Indonesia	27.7	12.4	21.5	3.7	--	1%	0.4%	1%	0.1%	--
Japan	47.6	39.6	33.4	44.3	56.4	1%	1%	1%	1%	2%
Malaysia	57.4	69.0	130.9	151.7	162.5	2%	2%	4%	4%	5%
Philippines	17.9	2.4	1.9	.7	.8	0.5%	0.1%	0.1%	0.02%	0.02%
Thailand	15.3	24.2	16.3	20.5	19.5	0.4%	1%	1%	1%	1%
Vietnam	.5	.5	.4	.6	--	0.01%	0.02%	0.01%	0.02%	--
World	3653.5	3146.0	3071.6	3400.1	3254.3	--	--	--	--	--
Cocoa Butter										
China	41.8	35.4	54.8	94.9	87.9	1%	1%	2%	2%	2%
Indonesia	.2	.1	2.8	9.9	--	0.01%	0.01%	0.08%	0.17%	--
Japan	91.2	84.9	103.8	195.8	141.3	2%	3%	3%	3%	3%
Malaysia	16.9	11.9	16.1	57.1	63.7	0.4%	0.4%	0.4%	1%	1%
Philippines	1.5	.7	.8	.5	.2	0.04%	0.03%	0.02%	0.01%	0.004%
Thailand	.8	.5	.6	1.0	.7	0.02%	0.02%	0.02%	0.02%	0.01%
Vietnam	.3	.2	.2	.3	--	0.01%	0.01%	0.01%	0.01%	--
World	3816.6	2672.3	3615.4	5945.6	5271.9	--	--	--	--	--
Cocoa Powder										
China	111.5	139.4	102.7	86.8	84.0	3%	4%	4%	4%	4%
Indonesia	45.9	56.0	45.8	37.3	--	1%	2%	2%	2%	--
Japan	98.3	99.9	69.3	56.1	60.6	3%	3%	3%	3%	3%
Malaysia	92.2	75.2	33.9	27.6	24.3	3%	2%	1%	1%	1%
Philippines	54.7	42.3	41.0	43.2	42.1	2%	1%	2%	2%	2%
Thailand	33.3	34.6	24.6	23.6	22.7	1%	1%	1%	1%	1%
Vietnam	12.5	14.1	11.1	9.3	--	0.4%	0.4%	0.4%	0.4%	--
World	3460.7	3263.3	2670.2	2115.5	2022.8	--	--	--	--	--
Chocolate										
China	227.9	275.7	352.4	464.8	515.9	1%	1%	1%	2%	2%
Indonesia	38.8	45.4	57.1	76.6	--	0.2%	0.2%	0.2%	0.3%	--
Japan	578.7	626.1	614.8	656.0	557.2	3%	3%	2%	2%	2%
Malaysia	122.8	129.1	139.3	156.2	143.0	1%	1%	1%	1%	1%
Philippines	30.9	34.9	38.6	61.3	88.1	0.1%	0.2%	0.2%	0.2%	0.4%
Thailand	83.9	121.9	120.6	106.5	112.2	0.4%	1%	0.5%	0.4%	0.5%
Vietnam	15.5	15.9	21.0	22.3	--	0.1%	0.1%	0.1%	0.1%	--
World	22481.7	22990.0	25222.1	27016.2	24371.6	--	--	--	--	--

Source: UN Comtrade, HS2002- 1801,1803,1804,1805,1806; downloaded 10/25/2016

Table A- 2. Profile of Leading Philippine Cocoa-Chocolate Export Markets, 2007-2015

	Export Value (US\$, millions)					% of GVC Segment Export				
	2007	2009	2011	2013	2015	2007	2009	2011	2013	2015
Cocoa Beans										
Malaysia	--	.30	.27	1.53	4.00	--	41.4%	20.3%	76.2%	68.4%
Thailand	.14	.26	.29	--	1.78	99.6%	35.9%	22.0%	--	30.5%
USA	--	.02	.04	.04	.04	--	2.5%	3.3%	2.0%	0.7%
New Zealand	--	--	--	--	.01	--	--	--	--	0.2%
Netherlands	--	.14	.38	.18	--	--	20.0%	28.9%	8.9%	--
Canada	--	--	.02	.01	--	--	--	1.6%	0.5%	--
Singapore	--	--	--	.07	--	--	--	--	3.3%	--
Germany	--	--	--	.07	--	--	--	--	3.4%	--
Belgium	--	--	.31	--	--	--	--	23.7%	--	--
Indonesia	--	--	--	.11	--	--	--	--	5.5%	--
World	.14	.72	1.33	2.00	5.84	100%	100%	100%	100%	100%
Cocoa Butter										
USA	1.62	1.45	1.78	1.44	2.12	50.5%	47.5%	34.3%	35.7%	64.3%
Germany	--	.11	1.38	--	.62	--	3.6%	26.5%	--	18.6%
Netherlands	--	1.10	1.11	1.62	.54	--	35.9%	21.3%	40.3%	16.2%
Canada	--	--	--	--	.03	--	--	--	--	0.9%
Malaysia	--	.02	--	--	--	--	0.7%	--	--	--
Aruba	.01	--	--	--	--	0.2%	--	--	--	--
Australia	.07	--	--	--	--	2.2%	--	--	--	--
France	1.51	.38	.27	.18	--	47.1%	12.3%	5.2%	4.6%	--
United Kingdom	--	--	.65	.78	--	--	--	12.6%	19.5%	--
World	3.21	3.06	5.19	4.03	3.30	100%	100%	100%	100%	100%
Chocolate										
USA	.09	.12	.54	9.86	8.42	1.56%	1.92%	8.91%	56.18%	57.01%
Thailand	2.39	2.87	.67	.94	.84	42.9%	46.1%	11.0%	5.3%	5.7%
Rep. of Korea	.03	.04	.45	.42	.78	0.5%	0.6%	7.3%	2.4%	5.2%
Maldives	.01	--	--	--	.67	0.1%	--	--	--	4.5%
China, Hong Kong SAR	.21	.23	.48	.39	.65	3.8%	3.7%	7.8%	2.2%	4.4%
Mauritius	.34	.43	.57	.61	.47	6.1%	7.0%	9.3%	3.5%	3.2%
China	.51	.01	.09	.08	.36	9.1%	0.1%	1.5%	0.5%	2.5%
Brunei Darussalam	--	--	--	1.41	.29	--	--	--	8.0%	2.0%
Unspecified Asian nations	.46	.46	.90	.51	.23	8.3%	7.4%	14.8%	2.9%	1.6%
Malaysia	.26	.10	.54	.12	.20	4.7%	1.7%	8.9%	0.7%	1.3%
Australia	.51	1.06	.22	.22	.14	9.2%	17.0%	3.5%	1.3%	0.9%
United Arab Emirates	.04	.08	.39	.59	--	0.7%	1.2%	6.4%	3.4%	--
World	5.56	6.22	6.09	17.55	14.77	100%	100%	100%	100%	100%

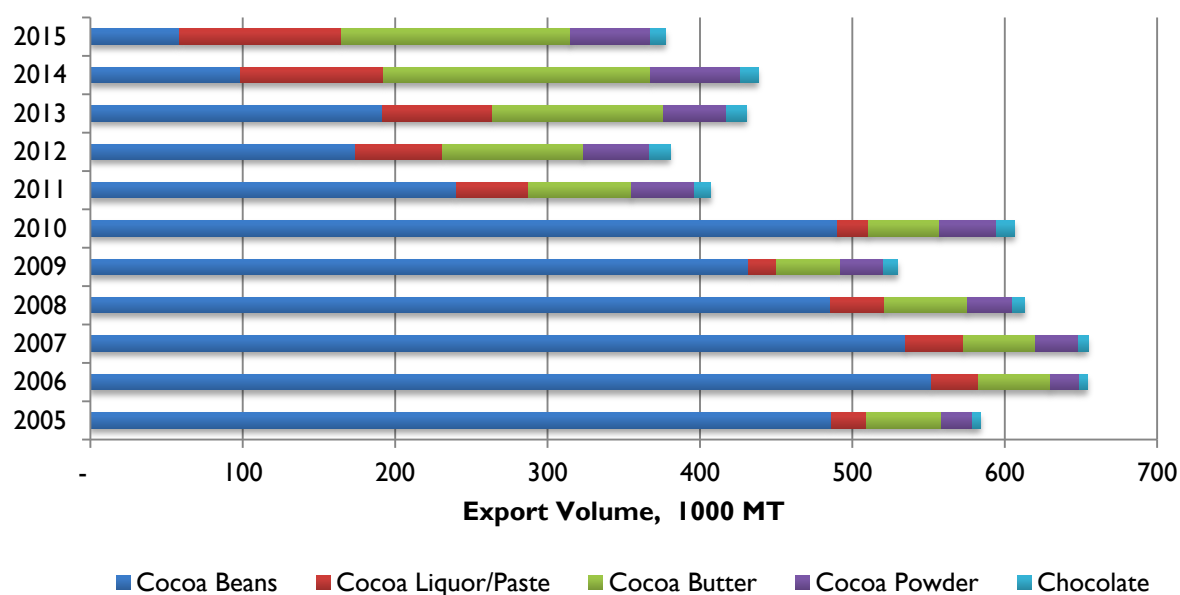
Source: UN Comtrade based on HS codes 1801, 1803, 1804, 1805, 1806. Retrieved on October 25, 2016.

Table A- 3. Indonesian Export Unit Price (US\$/kg), 2005-2015

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Cocoa Beans	\$1.36	\$1.40	\$1.72	\$2.50	\$2.56	\$2.88	\$2.98	\$2.48	\$2.45	\$3.16	\$3.09
Cocoa Paste	\$1.10	\$0.66	\$0.86	\$1.11	\$1.78	\$3.30	\$4.06	\$3.78	\$2.87	\$2.72	\$2.64
Cocoa Butter	\$4.07	\$3.96	\$4.68	\$6.37	\$6.24	\$5.59	\$4.42	\$3.00	\$3.73	\$4.36	\$5.32
Cocoa Powder	\$1.18	\$1.04	\$1.09	\$1.13	\$1.68	\$3.02	\$3.95	\$4.07	\$2.88	\$1.92	\$1.99
Chocolate	\$2.15	\$2.21	\$2.21	\$1.85	\$2.39	\$2.71	\$3.12	\$3.08	\$2.67	\$3.07	\$2.91

Source: UN Comtrade based on HS codes 1801,1803,1804,1805, and 1806. Retrieved on October 25, 2016.

Figure A- 1. Indonesian Export Volumes (MT) by Cocoa-Chocolate GVC Segment, 2005-2015



Source: UN Comtrade based on HS codes 1801,1803, 1804, 1805, &1806. Retrieved on October 25, 2016

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