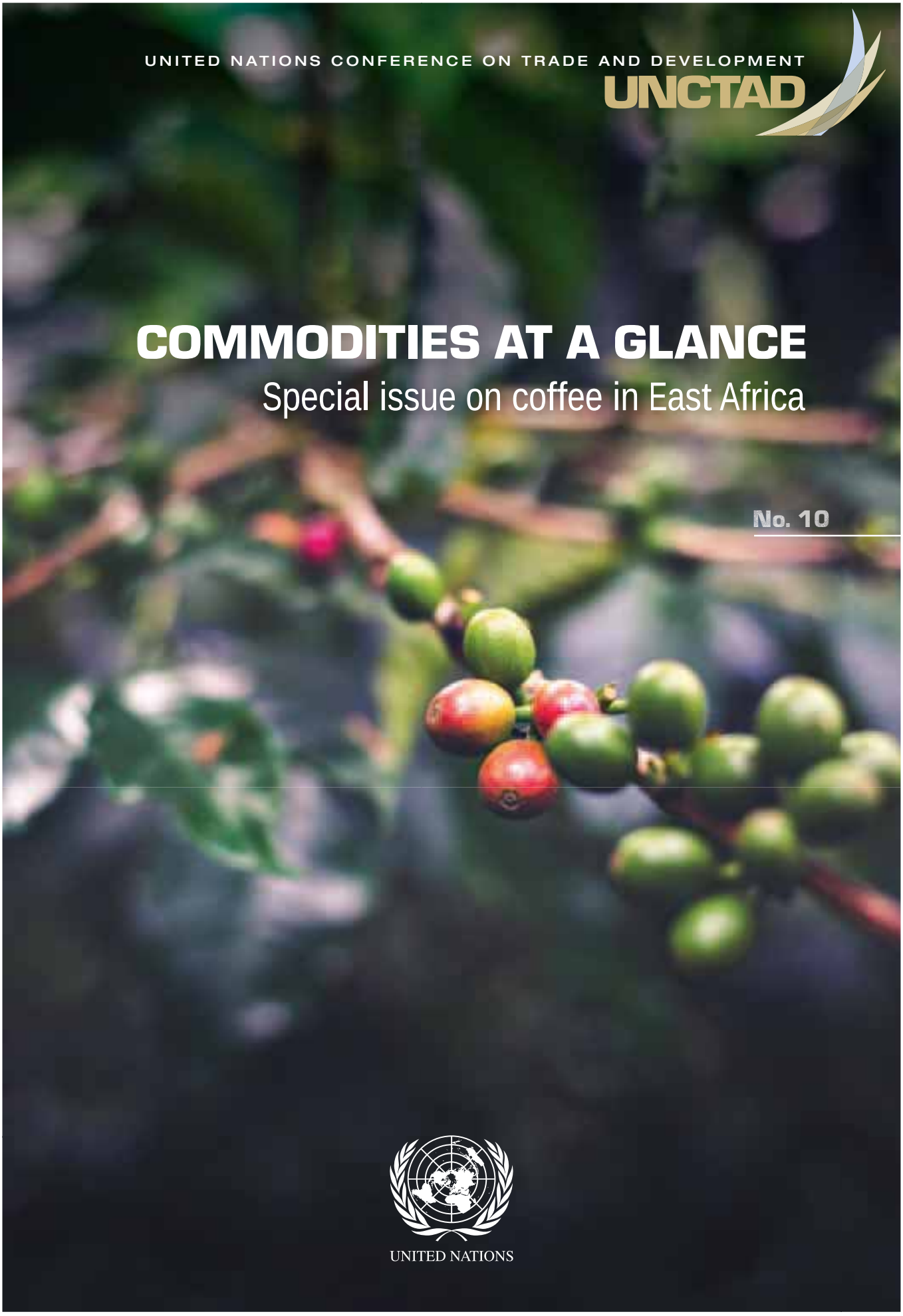

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COMMODITIES AT A GLANCE

Special issue on coffee in East Africa

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The series, Commodities at a Glance, aims to collect, present and disseminate accurate and relevant statistical information linked to international primary commodity markets in a clear, concise and reader-friendly format.

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EXPLANATORY NOTES

All data sources are indicated under the relevant tables and figures.

Reference to “dollars”, or use of the $ symbol, signifies United States dollars, unless otherwise specified.

Reference to “bags” in this report represents bags of 60-kg net green coffee equivalent.

The term “tons” refers to metric tons.

Unless otherwise stated, all prices in this report are in nominal terms.

ABBREVIATIONS

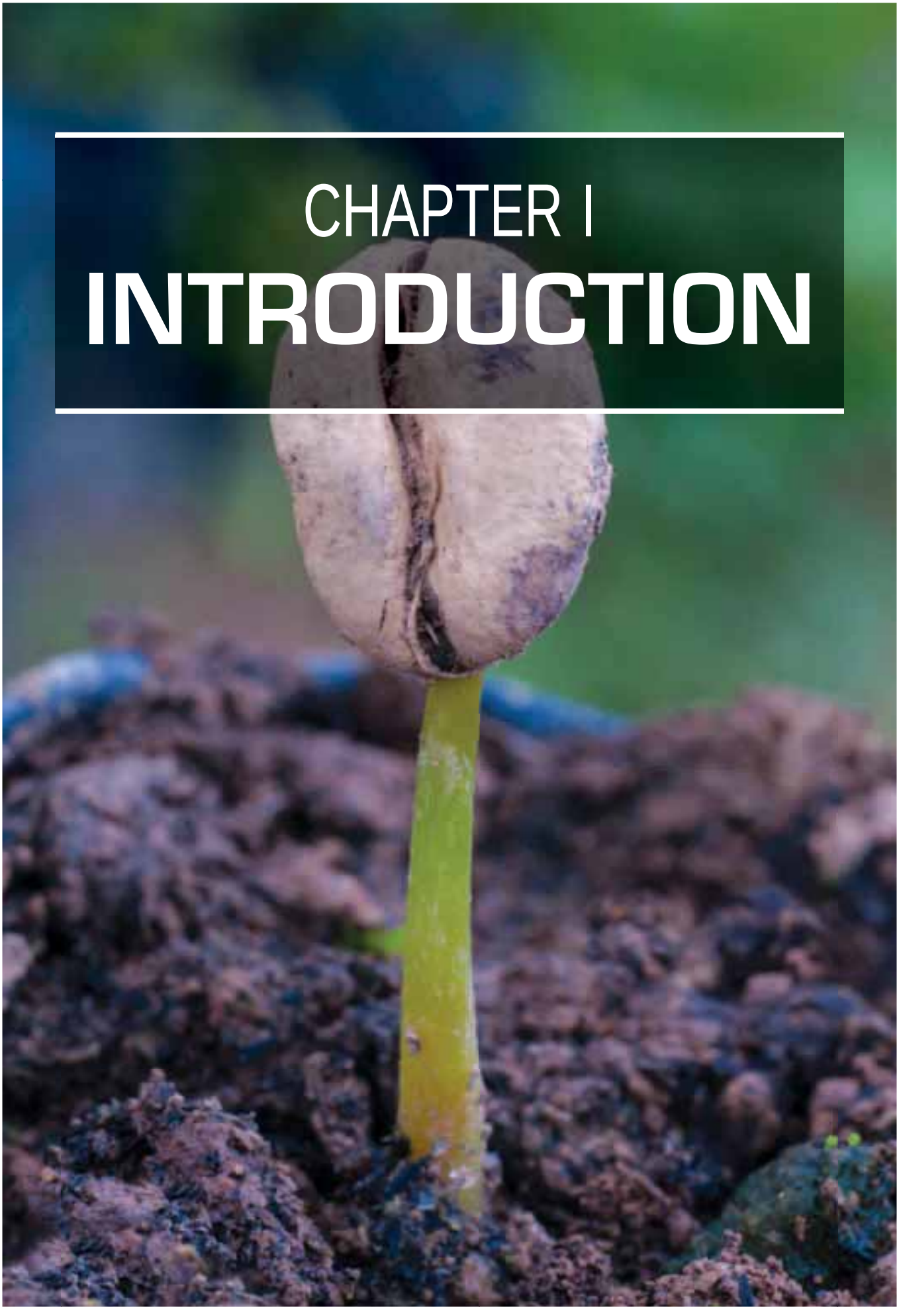
AFCA	African Fine Coffees Association
ARFIC	Agence de Régulation de la Filière Café
CVC	coffee value chain
ECX	Ethiopian Commodity Exchange
ICA	International Coffee Agreement (1962-1989)
ICO	International Coffee Organization
INTERCAFE	Association Interprofessionnelle du café du Burundi
NAEB	National agricultural Export Development Board
TCB	Tanzanian Coffee Board
UCDA	Uganda Coffee Development Authority

CONTENTS

FIGURES

BOXES

TABLES



CHAPTER I
INTRODUCTION

The coffee industry has been growing sustainably for over 500 years (Clarence-Smith et al., 2003). Today, coffee is one of the most highly consumed beverages in the world.

In both producing and consuming countries, coffee is an important commodity. According to the International Coffee Organization (ICO), more than 120 million people in the world rely on activities relating to coffee production for their livelihoods. This includes 25 million smallholder farmers and workers living in poor socioeconomic conditions (ICO, 2014). Coffee is also among the most valuable traded commodities. In developing countries, it was the second most exported primary commodity after oil, in value terms, during most of the 1970s and until the 2000s. However, since then, it has lost its prominence to other agricultural commodities, such as palm oil and soybeans (Talbot, 2004). In 2016, trade in coffee, whether roasted or decaffeinated, was worth $30.7 billion.[1] Global production and consumption of coffee have been growing steadily over the past 30 years, and are expected to continue rising, even though the growth rate of global production has been declining. The annual average growth rates of production were 2.6 per cent during the period between 1991 and 2000, 2.5 per cent between 2001 and 2010, and 1.9 per cent between 2011 and 2017. On the other hand, the annual average growth rates of consumption of coffee have been increasing, at 1.4 per cent between 1991 and 2000, 2.1 per cent between 2001 and 2010, and 2.2 per cent since 2011. This increase has been driven largely by growing demand in exporting countries and emerging markets.[2]

This report focuses on the coffee industry by exploring latest developments and examining the current state of coffee production and trade across East Africa where over 5 million people are either coffee growers or work in the coffee sector. The aim is to discuss the importance of coffee in various East African economies and the sustainability of their coffee value chain (CVC). The report highlights the key issues and challenges at the production and initial processing stages, and their effects on the well-being of smallholder growers and processors. It concludes by shedding some light on opportunities for value addition.

For many producing countries, coffee is a major export product and a vital source of foreign exchange. It also is an important contributor to rural employment. All East African countries are commodity-dependent developing countries. For most of them, coffee production contributes significantly to their economic development. For example, coffee accounts for up to one quarter of merchandise export earnings in Ethiopia, and for as much as two thirds in Burundi in some years (UNCTAD, 2016). Thus, coffee is a strategic commodity both in microeconomic and macroeconomic terms.

Using East Africa as an example, this report analyses the CVC and highlights the extent to which market structures are oligopsonistic, with millions of smallholder coffee farmers selling their production to a limited number of major local and international buyers. As price takers, these smallholders are vulnerable to a global coffee market controlled by a handful of actors whose interests do not necessarily align with theirs. This leads to significant imbalances in the distribution of value among the various participants of the chain. The share of the retail price accruing to producing countries shrank from an average of 20 per cent during the period from 1960 to 1990, to an average of 13 per cent between 1990 and 2010 (Talbot, 1997; ICO Statistics), though from 2011 to 2016, this share rose to 17 per cent (ICO Statistics).

The report further discusses the importance of fostering value addition in source countries and rebalancing the position of smallholder farmers in the global CVC. It points out that the international coffee pricing system is mainly determined on stock exchange floors or by big integrated players in the wealthiest parts of the world, far from the small coffee farmers who constitute the backbone of this industry.

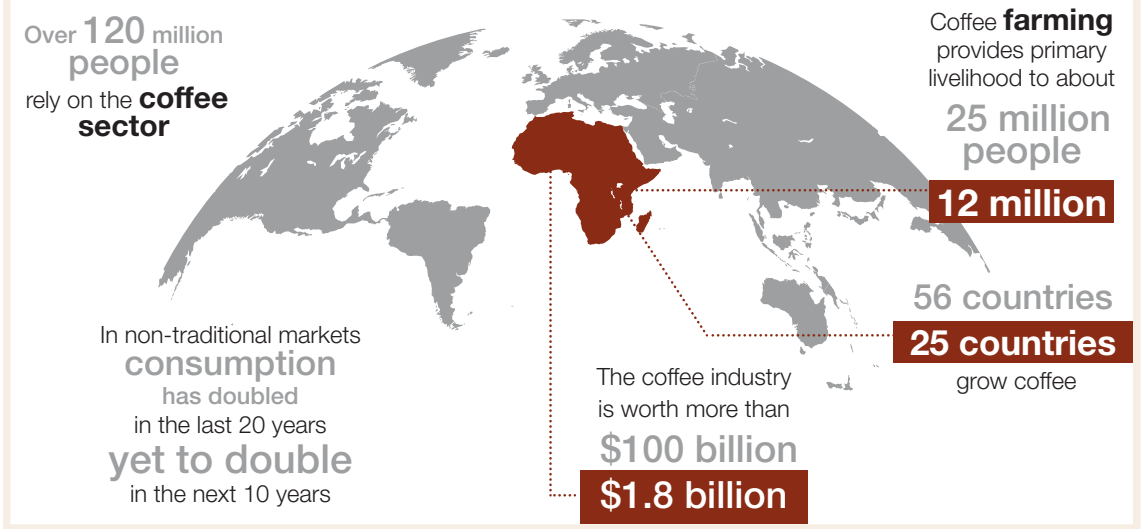
This discussion is carried out in a context where the demand for coffee is set to increase. Global consumption of coffee rose by more than two thirds between 1990 and 2016, from 93.6 million bags to 157.3 million bags. The strongest sources of that growth were non-traditional consuming markets[3] where consumption more than doubled over this period, from 19.5 million bags to 48.8 million bags, with further significant growth expected over the next few years (ICO, 2014; ICO Statistics).

[1] ITC Trade statistics. Available at: https://www.trademap.org/Index.aspx (accessed in December 2017). Henceforth, this source is referred to as "ITC Statistics".

[2] ICO Trade statistics. Available at http://www.ico.org/trade_statistics.asp (accessed in December 2017). Henceforth, this source is referred to as "ICO Statistics".

[3] Note: Non-traditional coffee consuming markets refer to coffee-exporting and emerging market economies. Traditional coffee consuming markets are mainly the United States of America, Canada, the European Union and Japan.

QUICK FACTS **Worldwide** and **Africa**



source: Based on data from ICO Statistics.

Current global supply does not match the projected demand. This poses challenges but also opportunities for East African and other coffee-producing countries. Opportunities include the development of high-valued coffee, labelled coffee and specialty coffee, as well as roasting close to origin and promoting single-coffee origin[4]. Some countries are more advanced than others, which should encourage the exchange of experiences not only among East African coffee-producing countries, but also between East Africa and other coffee-producing regions, particularly Central and South America, in terms of value-added production of coffee and differentiating and marketing strategies.

For coffee-producing East African countries to capture greater value from coffee production, they will need to implement an agricultural transformation agenda comprising the following elements:

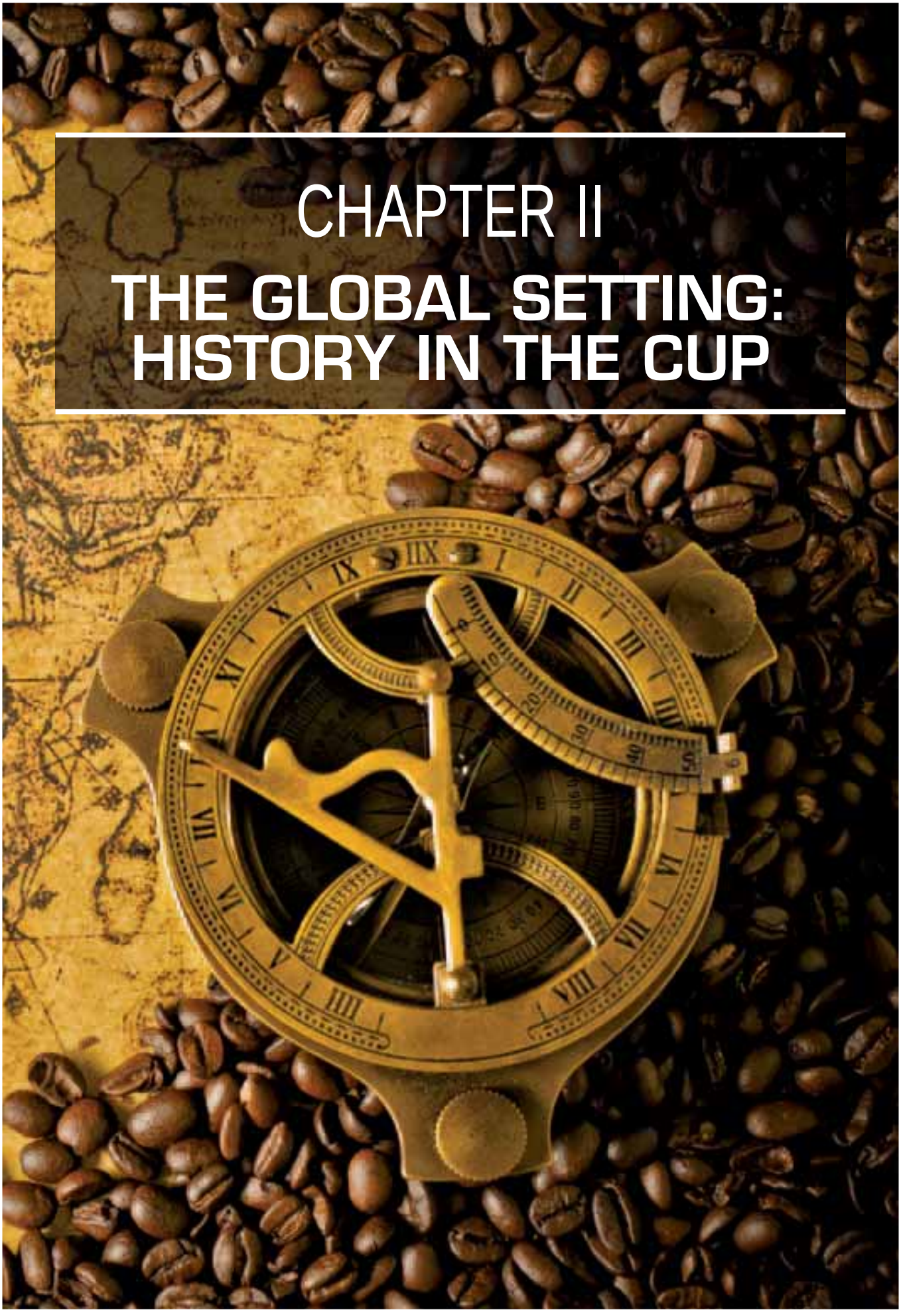
- Reinforcing good agricultural practices;
- Fostering the establishment of coffee farmers' associations;
- Strengthening producers' bargaining power;
- Promoting regional bodies such as the African Fine Coffees Association (AFCA); and
- Making financing available (e.g. prefinancing, investment and early purchase contracts).

This report is structured as follows. Section II provides a brief history of coffee, from the remote tropical forests of Ethiopia where coffee was first "discovered" to the current globilized commodity, traded and consumed all over the world. Section III describes the coffee value chain (CVC), from tree to cup. Section IV introduces the East African coffee scene. Section V is devoted to two country case studies, focusing on the contrasting cases of Burundi and Ethiopia. Finally, the last section outlines the challenges and opportunities associated with the coffee sector in producing countries, with a focus on East Africa.

[4] Coffee grown within a single known geographic origin.

CHAPTER II

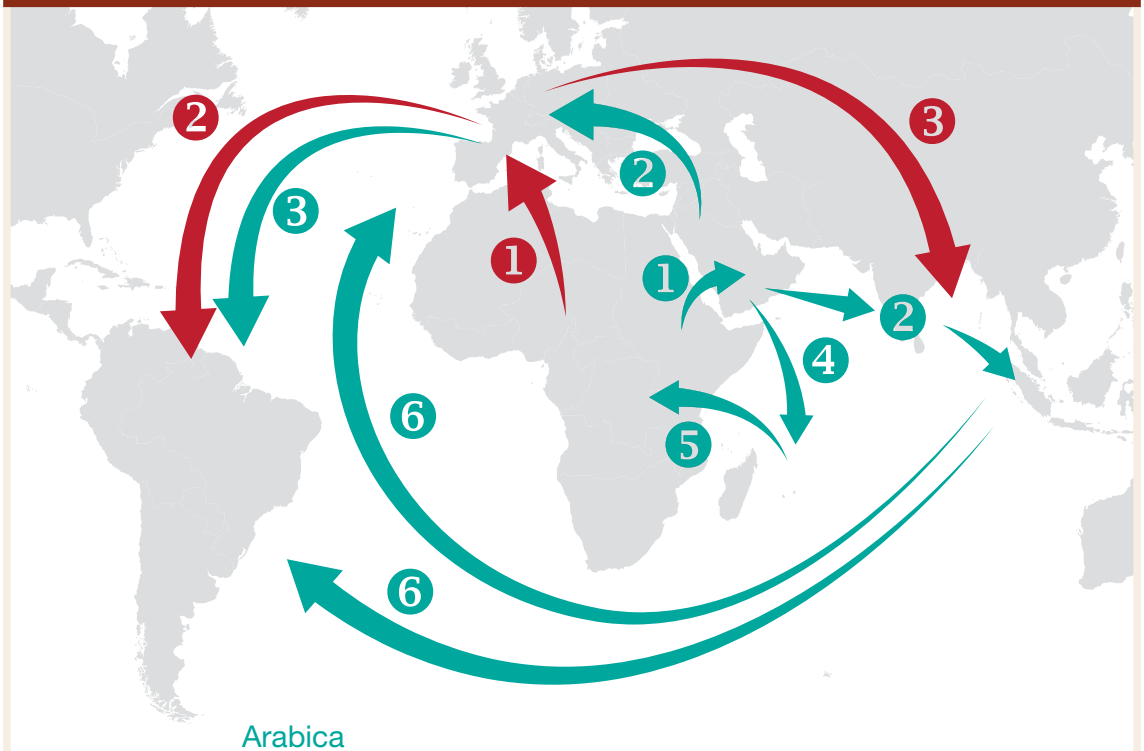
THE GLOBAL SETTING: HISTORY IN THE CUP



1. Origins

Coffee was "discovered" between the seventh and eighth century (figure 1), when Khalid the legendary Ethiopian goatherd noticed his flock eating bright red berries and subsequently hopping around energetically. He certainly could never have thought he was witnessing the launch of one of the most popular beverages that would have a profound impact on human history, linking peoples, continents and nations beyond social, cultural, religious and political barriers over a cup. This may be a myth, but many historians, archeobotanists, and ecologists agree that coffee originated in the southwestern side of the Great Rift Valley (the Kaffa region in the southwestern Ethiopia highlands, the Boma Plateau in the Sudan and Mount Marsabit in Kenya) (Anthony et al., 2002; Halevy, 2011).

Figure 1 – Historical distribution of coffee seeds around the world



Arabica

1. From Ethiopia to Yemen (500–1500)
2. From West Asia to the Netherlands (1616), India (1660s) and Indonesia (1690s)
3. From the Netherlands/France to the Caribbean then South America (1720s)
4. From West Asia by the French to Reunion (1715)
5. From Reunion to East Africa and Latin America (late 1800s)
6. From Asia to Europe (early 1700s) and Latin America (1760s)

Robusta

1. From Central Africa to France (1890s)
2. To America (early 1900s)
3. To Asia (1900s)

Source: UNCTAD secretariat; Pendergrast, 2010.

Arab monopoly

There is unsubstantiated evidence of consumption, trading and knowledge of coffee before the late Middle Ages, which makes coffee a young beverage compared to tea, wine or cocoa, which were known to have been established thousands of years before coffee. The first written sources indicate that Ethiopian Arabica coffee plants were introduced to Yemen before the fifteenth century, when they were first cultivated and used by Yemen's Sufi monasteries (Tuchscherer, 2003). Thereafter, from the Yemeni port of Mocha, a major marketplace for coffee from the fifteenth to eighteenth century, coffee consumption spread quickly throughout the Arabian Peninsula, reaching Makkah, Cairo and Istanbul in the late fifteenth century. By the seventeenth century, coffee had reached West Asia, South India, the entire North African coast, the Balkans, Italy and then the rest of Europe.

Known as the wine of Islam, blessed by the Pope, drunk by Emperors, used by monks to keep them awake during long prayer sessions, sought by students to boost their performance, coffee was soon to become a familiar item in shops and homes in all these places. During the first two centuries after its discovery, coffee as a commodity was dominated by West Asian producers and Hindu merchant communities. Relatively small quantities – between 12,000 and 15,000 tons – were produced in Yemen in the late eighteenth century (Tuchscherer, 2003), making coffee a luxury good.

Colonial commodity

From the late 1600s to the early 1700s, coffee plants were introduced for cultivation by traders, missionaries and colonists to Southeast Asia (Ceylon, Sumatra, Java, Celebes), the French Antilles, and then to South and Central America (table 1). By the 1800s and 1900s, French coffee – "Bourbon type" (the first plants being produced in Reunion) – was introduced to East Africa and South America. Coffee cultivation and trade were heavily linked with slavery, forced labour, colonialism and capitalism, which contributed to its spread across regions. Thereafter, global production and trade increased dramatically, as coffee was a highly valued product with a ready consumer market in Europe, and later, North America. Amsterdam became the leading coffee hub for a century. The commodity was dominated by European colonial production systems in Asia and America that targeted a relatively narrow and high-priced market.

Table 1 – Introduction of coffee plants to different countries

Year	To	Description of events
500-1500	Yemen	Coffee beans from Ethiopia
1660s	India	Coffee beans from Yemen by Baba Budan
1690s	Ceylon (now Sri Lanka)	Cultivation started in Ceylon by the Dutch
1699	Indonesia	Seedlings imported from Malabar (India) to Java by Muslim traders
1706	The Netherlands	Reports of arrival of coffee seeds in Amsterdam
1715	Reunion	Seeds from Yemen brought by the French
1727	Brazil	Plant from French Guiana transported by Francisco de Melo Palheta and planted in the state of Pará
1730	Jamaica	Began to grow coffee
1740	Philippines	Plants introduced in Lipa by the Spanish
1750	Indonesia	First plants in Celebes
1779	Costa Rica	Plants brought from Cuba
1783	Indonesia	Imports of seedlings into Sumatra from India by Muslim traders
1784	Venezuela (now Bolivarian Republic of Venezuela)	Plants imported from Martinique
1822	Angola	Exports of Robusta
1880s	Australia	First coffee plantation established
1893	Kenya	Introduction of bourbon type plants by French missionaries
1898	Tanganyika (now the United Republic of Tanzania)	First plants brought to Kilimanjaro by Catholic missionaries
1920s	Africa	Expansion of Robusta

Source: UNCTAD secretariat; Clarence-Smith et al.,2003.

Rise of coffee-producing nations

Brought to the Caribbean in the eighteenth century (Topik, 2004), the French coffee plants spread substantially to Central and South America. By the mid-eighteenth century, French colonies supplied two thirds of the world's coffee, led by Saint-Domingue (now Haiti), then the largest coffee exporter in the world. Before the French Revolution and anti-slavery insurrection in 1789, about 40,000 tons of coffee were produced. It is only in the mid-nineteenth century that Brazil emerged as the largest producer and exporter of inexpensive coffee, shifting production and consumption patterns to reach a mass market. World consumption grew 15-fold in the nineteenth century (Ukers, 2012), with Brazil accounting for about 80 per cent of the expansion of world coffee production. The rest of the growth originated chiefly from other countries in Latin America (Colombia, Costa Rica, El Salvador, Guatemala and Venezuela (now the Bolivarian Republic of Venezuela)), while production in Asia and Africa plummeted from one third (in the 1830s) to 5 per cent of total world production within half a century.

In Ethiopia, coffee became a major export-oriented commodity in the late nineteenth and early twentieth centuries. Production relied on continued harvesting of wild forest trees in the country's southwestern areas (Sidamo), and on small farms in the northeast (Harar). Today, Ethiopia is the leading coffee producer and consumer in Africa.

2. The global coffee market

In 2016, the total value of the coffee industry, based on world consumption data and retail prices, was estimated to be about $188.9 billion.[5] The retail value of the United States coffee market alone amounted to $48 billion in 2015.[6] The total value of coffee exports by producing countries in 2016 reached $19.1 billion for a volume of 157.6 million bags (9.5 million tons) – a rise of nearly 400 per cent in value and 150 per cent in volume compared to 2001.[7] The global coffee market is forecast to continue growing, driven largely by increasing consumption in coffee-producing countries (e.g. India, Indonesia and Mexico) and in emerging consumer markets (e.g. the Russian Federation, the Republic of Korea and Algeria). The rise in coffee consumption is also the result of new consumption patterns, with booming demand for specialty coffees and certified coffees; but it is also due to rising urbanization, an increase in disposable income, the proliferation of coffee shops and the growing trend of a "café culture". However, the sustainability of coffee supply is at risk due to very low prices for green coffee, currently at their lowest level in decades. This is pushing many smallholder farmers to shift to other, more profitable, crops.

Almost all global coffee production occurs in the southern hemisphere, between the Tropics of Cancer and Capricorn (figure 2). Over 50 countries in Africa, Central and South America, and Asia, form what is known as the Coffee Belt or Coffee Growing Zone. About 10 million hectares of land (0.2 per cent of the world's agricultural area) are allocated to growing coffee, with more than half of it in South and Central America (3.9 million and 1.9 million, respectively), and the rest in Asia (2.2 million) and Africa (2 million). In 2016, 80 per cent of the world's green coffee production was exported. Brazil (3.3 million tons) and Viet Nam (1.5 million tons) together accounted for half of the total exports of this commodity. The Latin America and Caribbean region dominates the market in quantity and value terms ($10.7 billion), followed by Asia ($5.5 billion) and Africa ($1.9 billion).

On the other hand, consumption is concentrated in the northern hemisphere, where the largest share of value is captured through roasting, branding, packaging and retailing. In other words, most of the profits accrue outside the Coffee Belt.

The global coffee market connects about 25 million coffee-producing families to 500 million daily coffee consumers through multiple intermediate actors and complex power relationships. From the 1960s to the 1990s, the coffee market was regulated through negotiations that established export quotas and target prices. The market was relatively homogeneous and was not dominated by any particular actor. Today, international traders, roasters and retailers play a central role in the CVC and obtain a significantly large proportion of the value in that chain. For instance, two major roasters control about one-quarter of the market, while the top five international trading companies handle over 40 per cent of the total coffee trade. What follows is a description of the general aspects of the market for green and roasted beans and a discussion on the global governance and coordination driving the CVC.

[5] Note: The methodology used to estimate the total value of the coffee industry can be found in document: ICO (2014). World coffee trade, ICC111-5 Rev.1.

[6] National Coffee Association of the United States of America; see: http://www.ncausa.org (accessed on 18.01.2018).

[7] Based on data from UNCOMTRADE and ITC Statistics.

Green coffee market

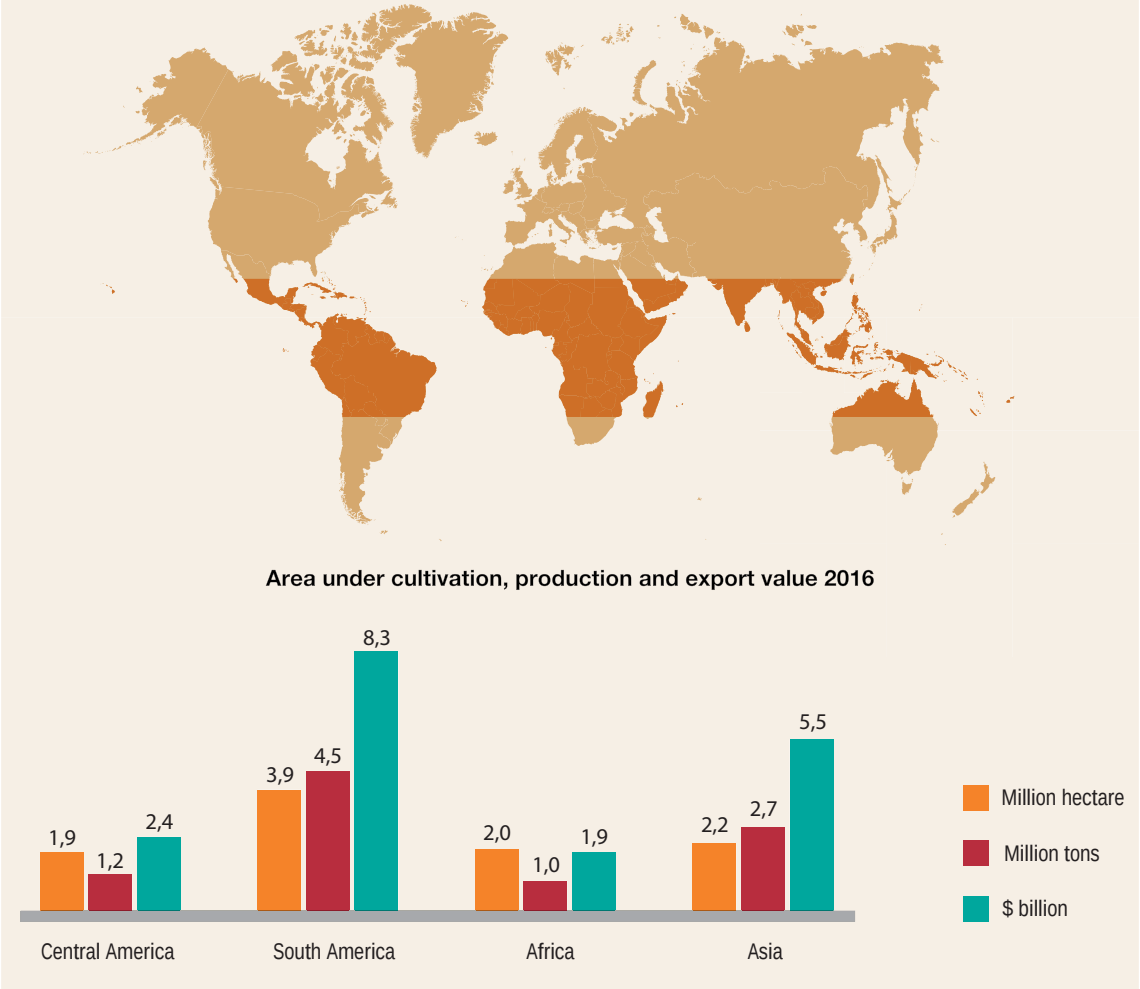
In the decades prior to the 1980s, Brazil and Central American countries, as well as Africa dominated green coffee production (figure 3A). In the 1990s, Viet Nam entered the market and quickly became a major producer. With an annual growth rate of 30 per cent between 1990 and 2000, it overtook Colombia as the world's second largest coffee producer. Africa is the region that experienced the steepest decline in green coffee bean output. Its share of world production fell from an average of 24.9 per cent of world output during the period 1962–1989 to 14 per cent during the period 1990–2014, and to 11 per cent between 2015 and 2017.[8]

There are different varieties and types of green coffee (figure 3B; see also box 1 and annex 1):

- **Mild Arabicas** (produced by the wet method) include: "Colombian Milds" (Colombia, Kenya, United Republic of Tanzania) and "Other Milds"

[8] ICO Statistics.

Figure 2 – The Coffee Belt



Source: UNCTAD secretariat based on data from ICO Statistics; see: https://melacoffee.com/pages/coffee-basics.

(Burundi, Central America, India, Malawi, Mexico, Rwanda, Papua New Guinea, Zambia).

- **Hard Arabicas** (unwashed coffee produced by the dry method) include: "Brazilian Naturals" (Brazil, Ethiopia, Paraguay) and other unwashed Arabicas (Ecuador, India).
- **Robustas:** all origins.

Each consuming country imports different types of green coffee adapted to its market. The major importers in 2016 were the United States (1.2 million tons), Germany (1.1 million tons), Italy (0.5 million tons), Japan (0.4 million tons) and Belgium (0.2 million tons) (figure 4D). These top five countries together accounted for half of all world coffee imports. Half of the United States' coffee imports were composed

Box 1 – Coffee cherry processing methods

Natural or unwashed process (dry processing)

In dry processing, coffee beans are dried inside the cherries. Cherries are sorted and placed in the sun to dry. They are raked regularly to ensure they dry evenly. Depending on the weather, they might take up to four weeks until they reach the required moisture level (around 11 per cent). The extended drying phase results in more components being absorbed, giving the coffee a more complex flavour.

Washed process (wet processing)

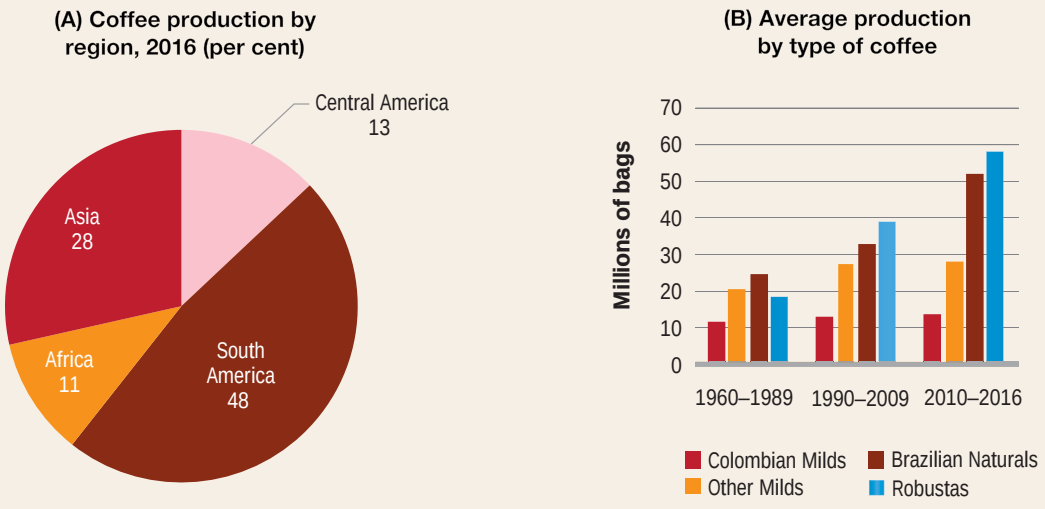
In wet processing, the coffee cherries are sorted and pulped (skin is removed). The sticky beans are placed in fermentation tanks for 24–38 hours, where a natural enzyme removes the mucilage. This fermentation is monitored closely to ensure the beans do not take on any undesirable flavours. Once the mucilage is off, the beans are dried to the required moisture level. Wet processed coffee tends to have brighter, cleaner flavours, with a lighter body than natural processed coffees.

Honey process (wet processing variation)

The honey process is a variation of the wet processing technique, where the coffee cherries are pulped, and the beans are dried in the sun still with some or all their mucilage. The mucilage is sweet and sticky, which gives these coffees their extremely sweet flavour.

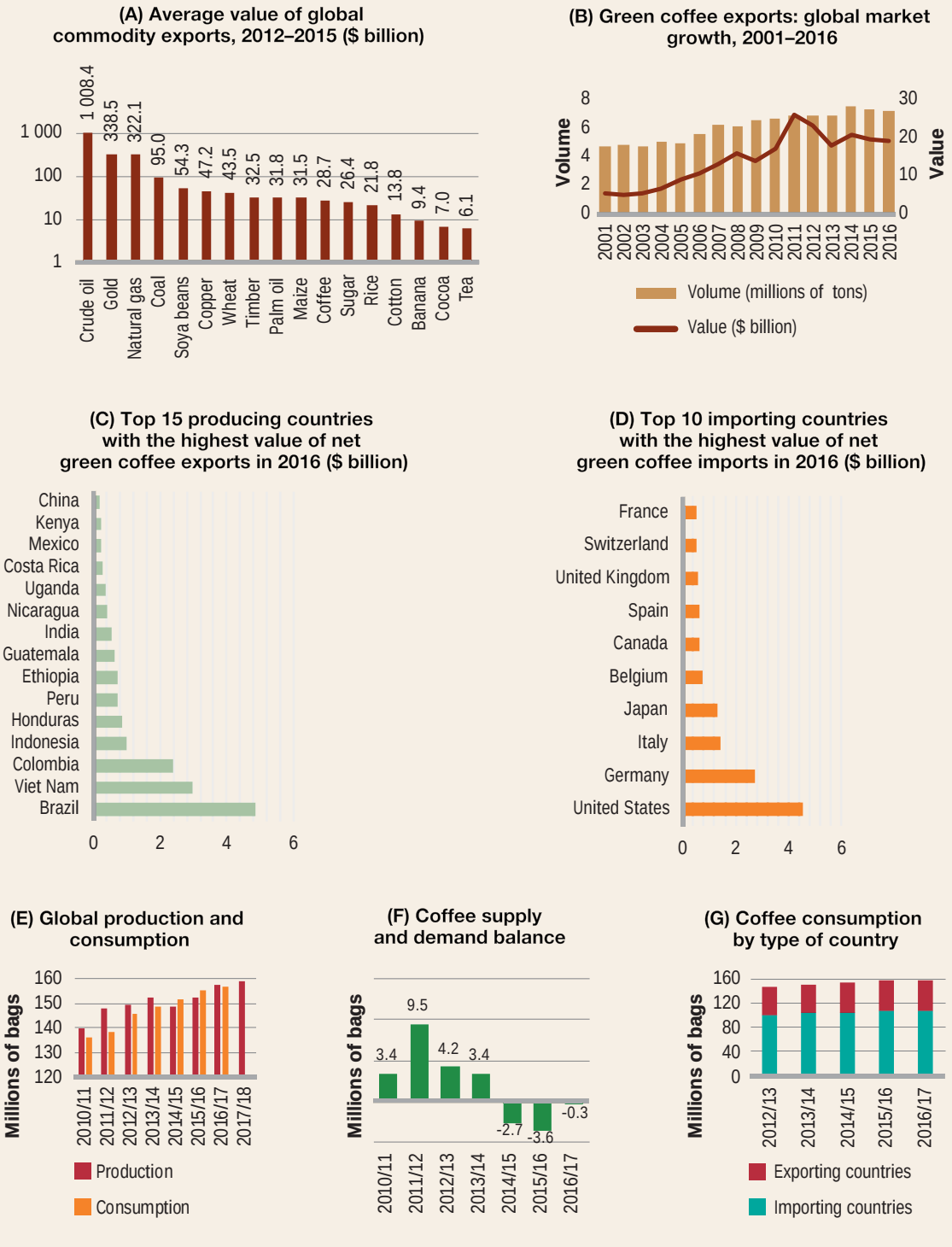
Source: https://www.perfectdailygrind.com/category/coffee-processing/ (accessed 18 December 2017).

Figure 3 – Green coffee production



Source: UNCTAD secretariat based on data from ICO Statistics; Worldstopexports.com.

Figure 4 – Global trade in green coffee



Source: UNCTAD secretariat based on data from ICO Statistic and UNCOMTRADE.
Note: Average value of global commodity exports, 2012–2015. Calculation for coffee is based on all coffee, whether or not roasted or decaffeinated.

of "Other Milds" whereas Japan's imports were mainly "Colombia Milds", and Eastern and Southern European countries focused on Robustas and "Hard Arabicas". However, since the 1990s there has been a global trend towards lower priced coffee types: "Other Milds", "Naturals" and Robustas. The proportion of Arabica coffee production relative to that of Robusta has gradually declined, largely due to the expansion of Robusta production in Viet Nam, but also because the cultivation of Robusta coffee is not particularly constrained by environmental conditions. The first major shift away from Arabica to Robusta occurred in 1997 when New York coffee futures prices (Arabica prices) rose to near historic highs, which led to a major shift among roasters towards cheaper Robusta coffees. Since then, the share of Robusta has increased to one third of the total.

Re-exports of green coffee by importing countries increased significantly between 2000 and 2016, from a volume of 20.5 million bags worth $2.4 billion to $12 billion for a volume of 30.1 million bags.[9] Indeed, re-exports now account for a significant 39 per cent of total export value. Europe dominates the market for re-exports of green coffee, accounting for three quarters of global re-exports. Germany has the largest share by volume (31 per cent), followed by Belgium (14 per cent), Italy (11 per cent) and the United States (8 per cent).[10]

Roast coffee market

In 2016, about 86 per cent of exported green coffee beans were roasted, blended and retailed as whole beans or ground coffee (figure 5). Of the exported green coffee beans, 14 per cent were used for instant or soluble coffee. The roasting and packaging market – either as whole roast beans or ground roast is characterized by many small manufacturers located in highly customized local markets. The instant and soluble roast coffee market is capital-intensive and is dominated by a few major companies such as Nestlé and Jacobs Douwe Egberts. Lately, new consumption patterns have emerged, with specialty and certified coffees gaining in importance; they now account for 10 per cent of the market share.

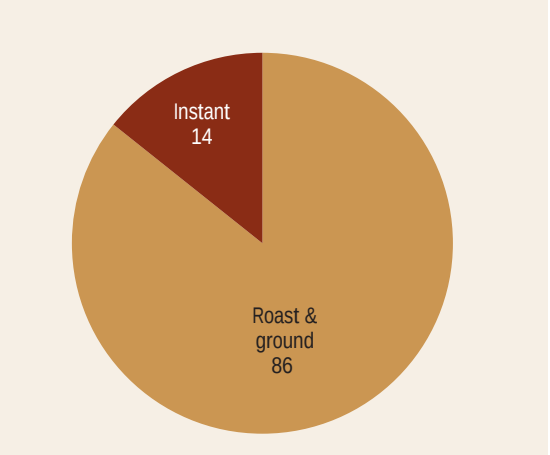
The European Union constitutes the largest consumer's market of roast coffee, accounting for almost 40 per cent of world consumption, followed by the United States (23 per cent) and Japan (7 per cent). Coffee consumption is steady in these traditional markets (about 2 per cent growth per year), whereas the biggest potential for growth is in the coffee-exporting countries and emerging markets, with annual growth rates of close to 10 and 20 per cent, respectively. Brazil is the major exception: it is the leading coffee producer and second largest consuming country in the world. In Africa, Ethiopia is the top producer with a strong coffee consuming culture, placing it at the top of the list of coffee consumers in Africa.

Market governance

The coffee market is highly organized. Coordination occurs mainly downstream in the CVC through taxes and tariffs in consumer markets. Almost all coffee-importing countries have eliminated import duties on green coffee. For processed coffee, import taxes vary depending on the kinds of economic partnership or bilateral trade agreements with producing countries. For example, Cameroon, Côte d'Ivoire, Kenya, Papua New Guinea, the United Republic of Tanzania and Uganda have privileged partnership agreements with the European Union which exempt them from import duties for green and processed coffee (ECF, 2011). Where applied, tariffs are entry barriers for producing countries interested in developing export-oriented roasting capacities.

The adoption by roasters of the Supplier Managed Inventory (SMI) system in the late 1990s allowed them to outsource stock management to trading houses, which minimized their costs (warehousing, finance

Figure 5 – Roast bean market share (per cent)



Source: Based on data from ITC trade statistics.

[9] ITC Statistics. Re-exports comprise all coffee, whether or not roasted or decaffeinated, and coffee substitutes containing coffee in any proportion.

[10] ITC Statistics.

and insurance), closely managed supply and demand, and particularly, accessed various origins and types of coffee. This reinforced the position of international trading houses, enabling them to strengthen their upstream networks.

At the international level, coffee is one of the first commodities for which trading at the global level was controlled. In 1962, most coffee producing and importing countries signed the first International Coffee Agreement (ICA), which aimed to manage demand and supply, spread industry knowledge, and improve the economic conditions of small-scale coffee farmers. The system was successful in maintaining producer price stability until the end of the 1980s (Akiyama and Vangaris, 1990). However, the increasing volume of coffee on the market and the gradual shift towards cheaper imports undermined this global coordination mechanism.

The break-up of the ICA in 1989 changed the dynamics, at both global and domestic levels. The global market recorded a dramatic fall in the international coffee price by 49 per cent. This contributed to an imbalance in the distribution of value along the value chain at the expense of the coffee-producing countries. A major consequence was a shift, leading to the dominance of large coffee buyers, and trading and manufacturing houses located in industrialized countries. This caused hardship in many producing countries. As a result, Africa's production plummeted by 35 per cent, as many small-scale coffee farmers moved to safer crops.

Ever since, little has been done upstream in the value chain, although several coffee-producing countries attempted to restore some control over production and export flows, for example through the establishment of the Association of Coffee Producing Countries (ACPC), between 1993 and 2002. However, coordination among producing countries has weakened, as many of them pursue divergent policies guided by domestic rather than their common economic interests.

Coffee prices

Evolution – Green coffee prices remain low, and most forecasts show no signs of improvement in the short and medium terms. Causes include an oversupply of coffee on the world market sustained by the global movement of coffee market deregulation since the 1990s.

During the ICA period, particularly in the 1980s (figure 6), coffee prices were relatively high and stable through the application of export quotas which matched supply to demand, limited competition, and helped stabilize the market. However, quotas also reduced total export earnings for most small exporting

Figure 6 – Coffee prices, 1973–2017

Source: UNCTAD secretariat based on data from Macrotrends; see: http://www.macrotrends.net
Note: Prices shown are for Coffee C Futures Contract in $ per pound, which is the world benchmark for Arabica coffee.

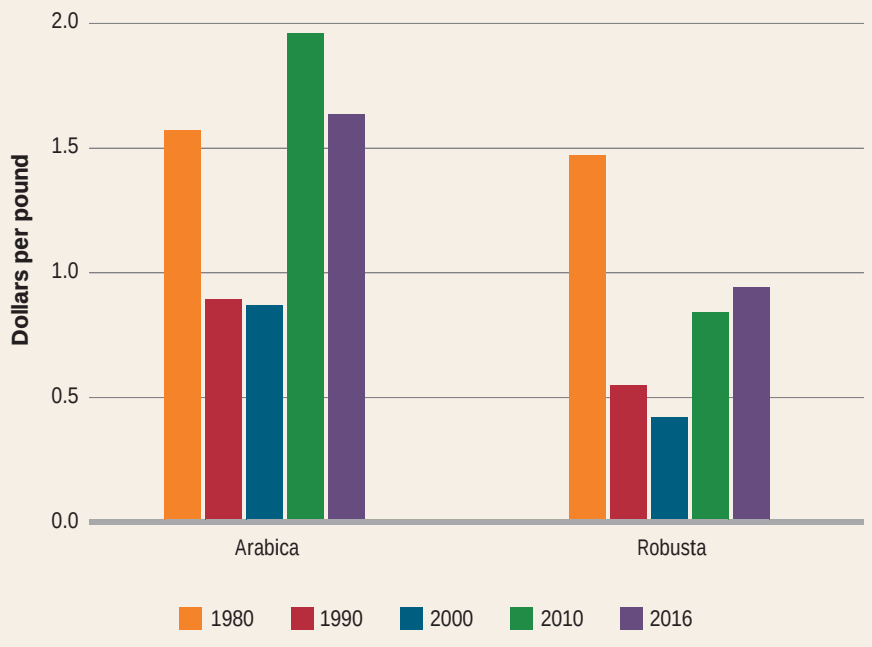
countries, while the large producers benefited from them. Price peaks often occurred following weather shocks, especially in Brazil. After the ICA was abandoned, prices plummeted, particularly during the 1989–1993 and 1997–2003 periods with prices breaking the one dollar per pound barrier. This was followed by a strong recovery over the period from 2004 to 2011, peaking in 2011, after the vast move of financial speculation into agricultural commodities.

Since the 1990s, world production has increased sharply following the entry of new players like Viet Nam, but also because of the progress made by more established producers through better agricultural practices, market liberalization and privatization, as well as supply chain efficiency. However, these factors eventually contributed to a continuation of general price downward trends by the end of the 1990s and more recently after 2011.

The imbalance in the distribution of bargaining power, where coffee producers are the weakest participants in the value chain, has contributed to keeping producer prices consistently low. In addition, rising production costs (inputs, infrastructure and labour) have exacerbated the downward price spiral, which in turn has exerted pressure on the weak economies of many coffee-producing countries.

Arabica vs Robusta – The price differentials between Arabica and Robusta widened between 1980 and 2000, with Arabica prices falling by 45 per cent and Robusta prices by 71 per cent during this period (figure 7). The average differential increased from $10.1 cents per pound in 1980 to $111.8 cents per pound in 2010, and $69.5 cents per pound in 2016. The price of Robusta green beans tends to be half that of Arabica green beans, or even less. As already noted earlier, this is essentially because Robusta's high plant yield and low labour requirement in farming makes it easier and cheaper to produce. Moreover, Robusta is produced in a more environment-friendly way than Arabica due to its sturdy nature, which should contribute to boosting its popularity among the increasing number of ecologically minded consumers, and ultimately reducing the gap between Arabica and Robusta prices.

Figure 7 – Evolution of average prices of Arabica vs Robusta prices, 1980–2016

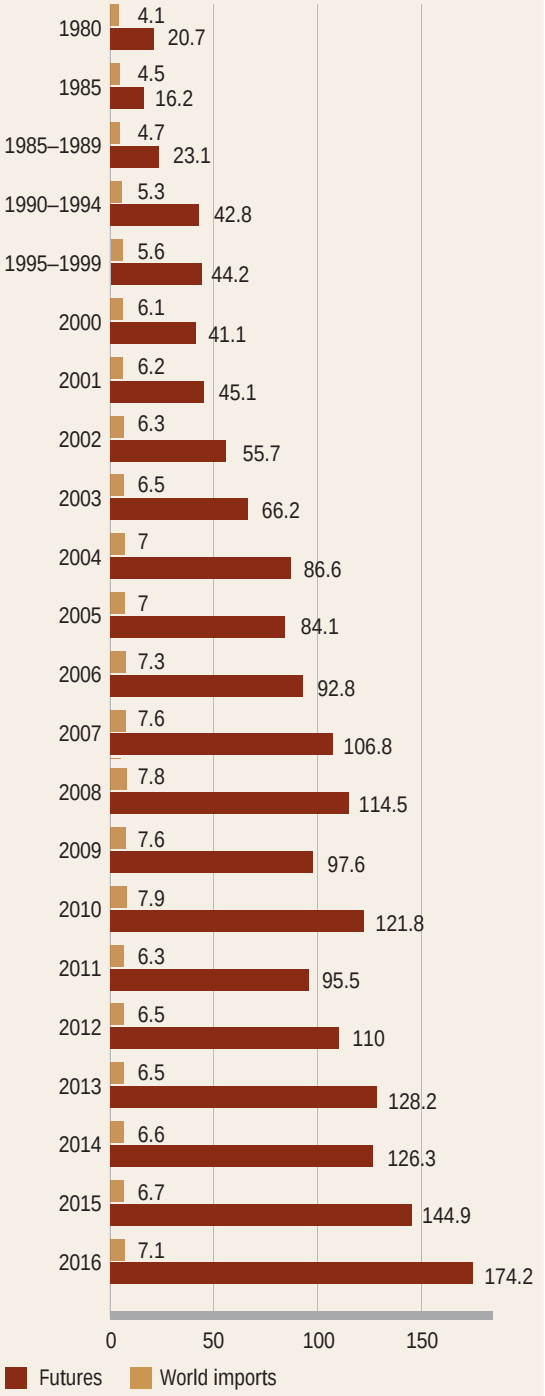


Source: UNCTAD secretariat based on data from ICO Statistics, Intercontinental Exchange (ICE), and London International Financial Futures and Options Exchange (LIFFE).

Figure 8 – Volume of trade in futures compared with green coffee imports

Annual turnover, 1980 - 2016

Millions of tons



Source: UNCTAD secretariat based on data from ITC (2012), ICE, and LIFFE.

Volatility – Price volatility is a major concern for all stakeholders along the coffee value chain, and particularly for those in the most vulnerable producing countries who rely heavily on coffee revenues and do not have access to appropriate risk management mechanisms. Hence, movements in coffee prices have dramatic effects on export earnings, tax revenues and foreign exchange, as well as on millions of smallholder farmers' incomes.

Price volatility occurs primarily because of changes in the global demand for and supply of coffee. As demand for coffee has been relatively stable over time, any change affecting supply (weather shocks or an unexpected surplus of coffee production) results in prices rising or falling on the international market. An all-time high price was reached in April 1977 ($339 cents per pound) during one of the most coffee damaging frosts in Brazil. Price peaks were also recorded in 1986, 1994, 1997,1999 and 2014 following climate-related damage to coffee crops in Brazil. In contrast, prices were at a historic low in 2001 owing to massive production of coffee, and thus an excessive supply on the market. Since the end of the ICA, the global coffee market has been characterized by dramatic price fluctuations (Russell et al., 2012), partly because of variations in the yields of large coffee-producing countries (Brazil, Colombia and Viet Nam) and changing demand for different coffee products.

Coffee price volatility is also caused by intense activity on financial markets, particularly the coffee futures market which is used for risk management (hedging)[11] as well as for speculation. During the period 1990–2016, the volume of trade in futures was 10 to 20 times that of physical green coffee imports (figure 8). Speculators' decisions to buy and sell can cause significant movements in the markets. The considerable speculation in the coffee market, and in commodity markets in general (as shown in figure 8), renders it difficult to stabilize coffee prices.

Fair trade price – The discussion above illustrates how smallholder coffee farmers and their communities in developing countries are price takers and vulnerable to the vagaries of international coffee markets. This situation has led to the fair-trade social movement, which seeks to improve the price paid to farmers

[11] Note: Hedging is a trading operation that enables management of the risks posed by unforeseen price movements. There are many strategies for hedging, most of which call for the use of coffee futures or options (ITC, 2012).

by connecting them directly to niche markets (organic, specialty and certified coffee markets). This movement encourages the adoption of early purchase agreements whereby coffee producers and roasters engage in a more stable contractual relationship that helps to stabilize producers' incomes.

The fair-trade coffee price is a minimum price paid to the producers (figure 9) which aims to cover their costs of production by making sure it respects the basic human rights and provides sustainable living conditions for their families and communities. The coffee must comply with standards outlined by a labelling system. The labelled coffee is often of high quality and organic and can fetch a higher price. Consumers are willing to pay more because they are mindful of the resulting socioeconomic benefits for the producers.

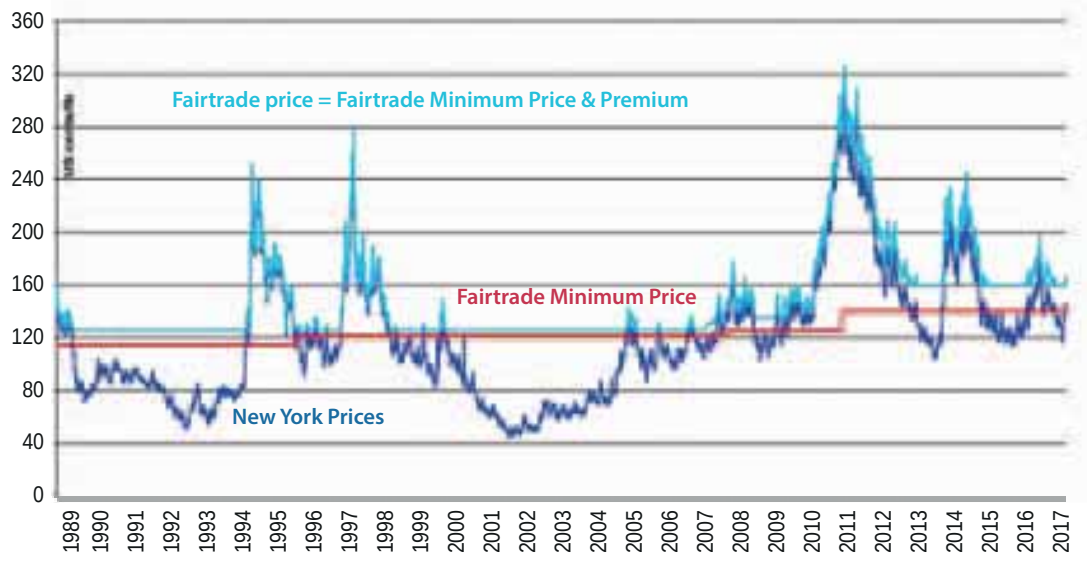
However, there are opponents of the fair-trade movement who do not criticize it for its humanitarian objectives but for its perceived weaknesses in the long run. For example, it does not address the issue of oversupply that leads to lower market prices. Besides, only a small proportion of qualified producers can sell through such channels. This movement will not solve all the problems facing smallholder coffee producers in developing countries; nevertheless, the communities that produce fair trade coffee are better positioned to benefit from the growth in demand for labelled products. Moreover, they could potentially take advantage of the emergence of alternative business models such as Direct Trade, as more roasters and coffee producers are dealing with each other more directly without the intervention of the traditional intermediaries.

3. The "next wave"

Many experts agree that there is a new way of consumption of coffee. In the 1960s, coffee became widely available on store shelves which pushed consumption to grow fast. Thereafter, coffee shop chains appeared in the landscape (e.g. Starbucks opened its first store in Seattle in 1971). This brought the second coffee wave, which prompted the need to improve quality and taste, along with coffee branding as a luxury product rather than a necessity. Coffee shop owners needed profitable businesses, leading to efficient supply chains and greater traceability of their products.

The third coffee wave today represents a shift towards rising demand for specialty coffees and a

Figure 9 – Coffee Arabica market versus Fairtrade Foundation minimum price, 1989–2017



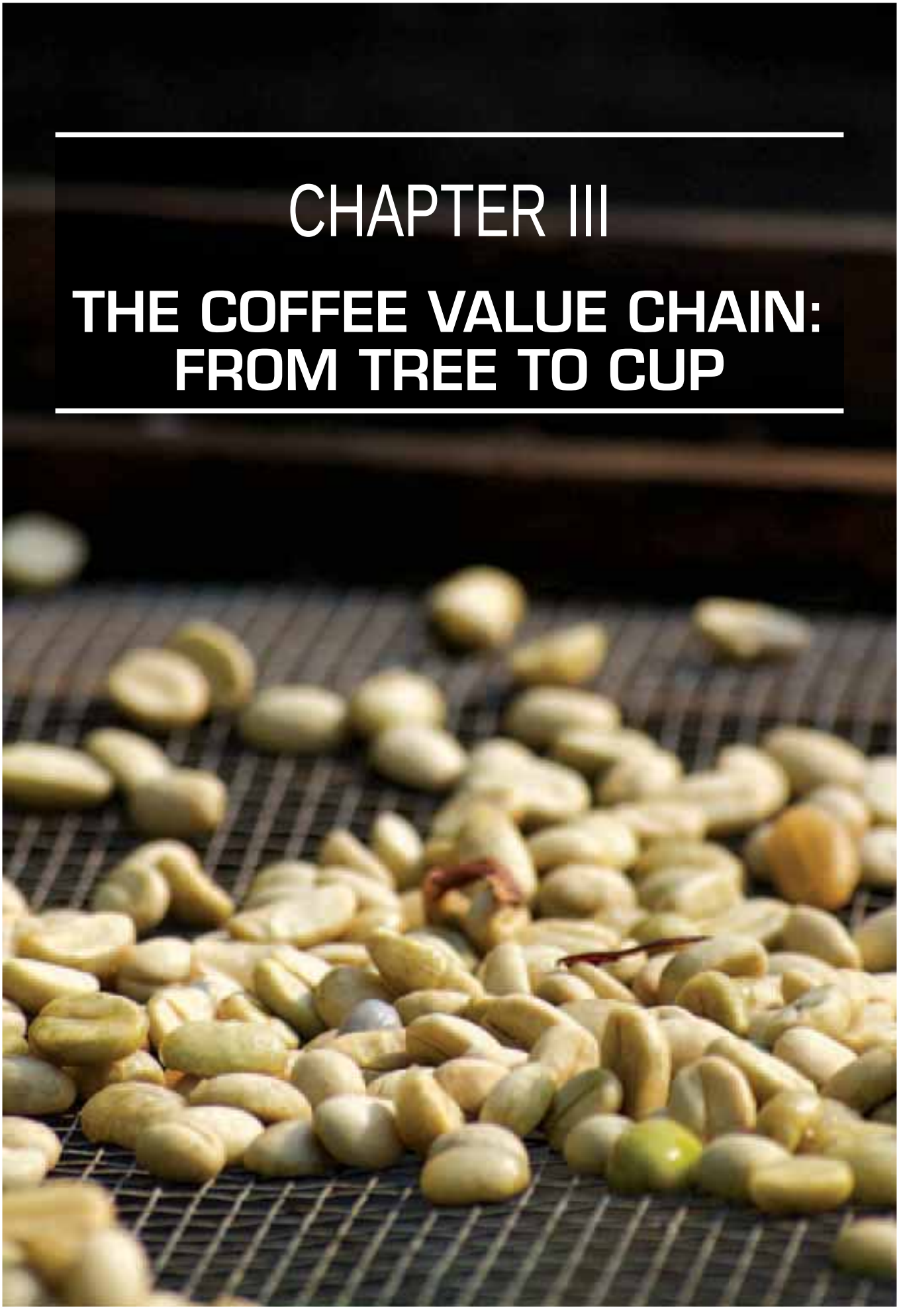
Source: Fairtrade Foundation (2017).

growing concern among consumers to know where their coffee is coming from, who produces it, how it is processed and packed, and what are its social, economic and environmental impacts along the supply chain. Consumers are willing to pay higher prices for quality and sustainability, and importers and roasters are increasingly integrating sustainability into their business models. Consequently, they are making significant investments in their supply chains and establishing stronger relationships with coffee producers at origin.

This global trend is expected to affect all producing countries, especially East African coffee producers, as some of the best specialty coffees are produced in this part of the world. To benefit from this global trend and the options available to smallholder farmers and cooperatives, the latter should consider embracing certification schemes such as Utz Certified, Max Havelaar, Starbucks' C.A.F.E. Practices, Rainforest Alliance, Common Code for the Coffee Community (4C) and others.

CHAPTER III

THE COFFEE VALUE CHAIN: FROM TREE TO CUP



The coffee industry is built upon a complex network of economic relationships and factors that involve various stakeholders engaged in growing, picking, processing, trading, storing, roasting, brewing and selling the cup of coffee that people enjoy in their daily lives (figure 10).[12]

It takes three to five years for the coffee seed to grow and bear fruit, and about six months from coffee bean to cup. The coffee bean reaches the cup only after transformation at different stages, travelling great distances, clearing a plethora of regulatory and lengthy bureaucratic processes, and often traded several times along the way before reaching its final destination. It is said that coffee can change hands as many as 150 times before reaching the final consumer (Milford, 2004).

Actors along the global coffee value chain (CVC) are scattered around the globe. They are organized into four major activities that are driving factors in the coffee economy, as follows:

- Growing practices and primary processing from cherry to green coffee beans
- Sourcing, marketing and trading of green coffee beans
- Roasting whole, ground or instant coffee beans
- Retailing coffee beans for in-home or out-of-home markets

This section maps the general development of the CVC by analysing each component outlined above and the different factors influencing and controlling the coffee industry at the global and micro levels. The analysis also presents the distribution of revenue along the CVC. This enables a further understanding of the underlying challenges along the value chain.

1. Organizational structure

Growing and primary processing

The production process encompasses: (1) planting coffee seeds and growing them into coffee trees; (2) harvesting the coffee cherry fruits when they ripen and turn red; and (3) processing and packing green coffee beans ready for export.

These operations are made by four key actors: (1a) smallholder farms; (1b) cooperatives; (1c) large-scale plantations/farms and estates; (2) intermediaries, referred to as collectors or internal traders; (3) processors; and (4) exporters. Altogether, these amount to over 25 million people located in over 50 coffee-producing countries around the world.

Inputs – Cultivating coffee demands land, labour and several inputs (seedlings, fertilizers, irrigation and machinery in large plantations). The varieties and the end-markets determine the type and quality of inputs and nursing which the coffee will require. Arabica production tends to use more inputs than Robusta. For coffee certified as organic, producers must use specific inputs. Farmers source these inputs directly, often with financial assistance from government agencies, non-governmental organizations (NGOs) or trading companies. Some surveys in East Africa indicate that the use of fertilizers and pesticides involves an annual average expenditure of about $600 per hectare (ICO, 2015).

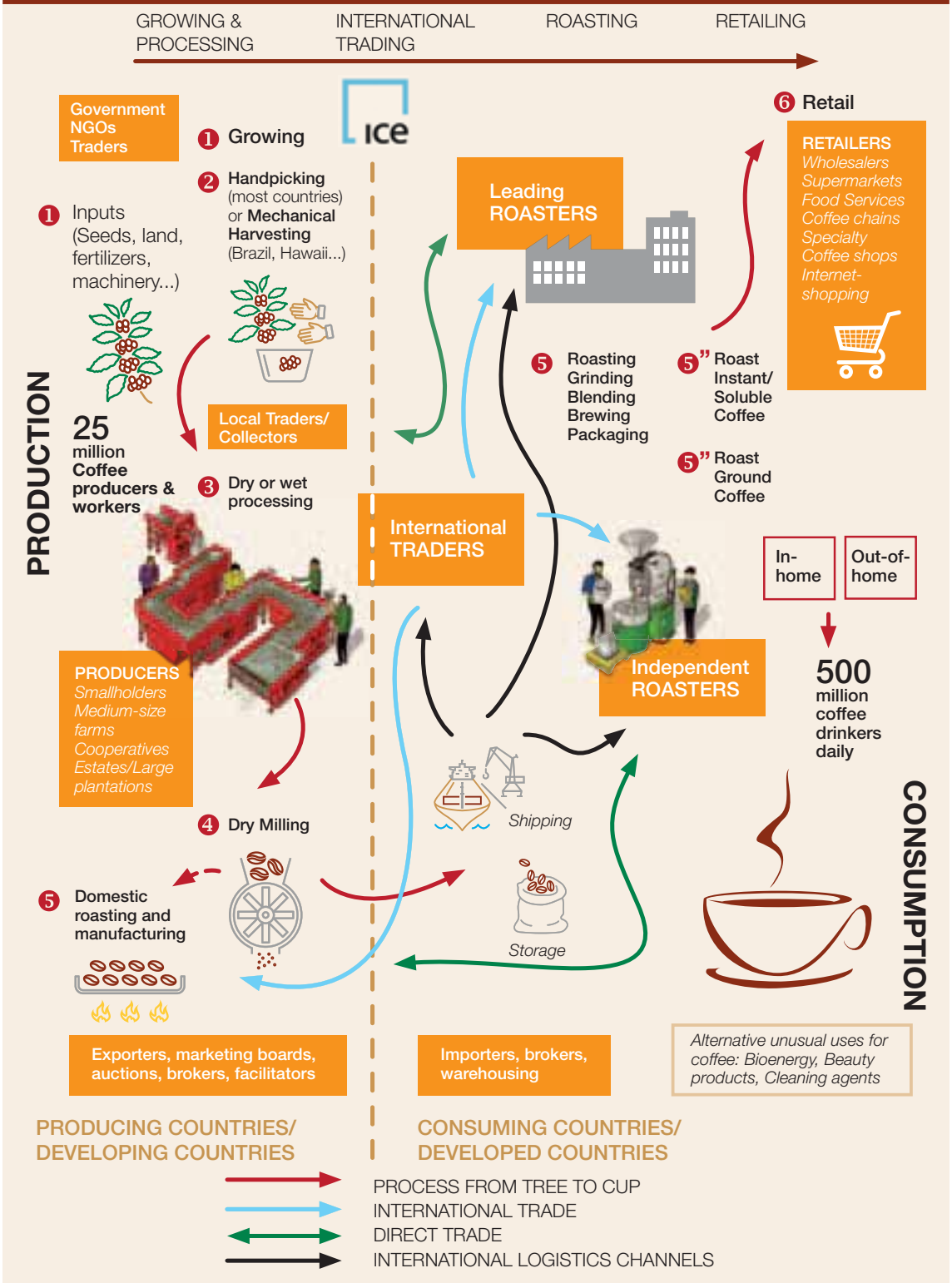
Growing – Coffee grows between the Tropics of Cancer and Capricorn, requiring temperatures between 13°C and 26°C. It also requires shade during its growth phase, sun when it starts to produce fruits, and regular rain. Ideally, Arabica coffee grows between 1,000 and 2,000 meters altitude, while 200 to 300 meters altitude is suitable for Robusta. Just like other fine crops, coffee has specific flavours and characteristics that are associated with its origin (typical soil, climate, altitude and treatment). High-quality coffee, greater volumes and capturing value depend on a combination of cultivation practices and better control of environmental factors. Above all, growing coffee requires patience and diligence, as growers need to wait 3–5 years after their initial investment before coffee plants mature and become productive.

Harvesting – Coffee cherries are typically harvested once a year, usually over a two- to three-month period. A few countries, including Colombia and Kenya, have a main and a secondary crop ("fly crop"). Various harvesting methods are used (Dicum and Luttinger, 2006).

- Hand-picking: This is the most commonly used process, where the cherries are handpicked only when they become ripe. Because of irregular maturation, the process is repeated as many times as required until all the cherries are harvested. The more selective the picking (meaning labour- and time-intensive), the higher will be the quality of the green beans.
- Strip-picking: This process involves removing, by hand or machine, all the cherries from the branches, whether or not ripe, including those damaged as well as the flowers. This method is

[12] See annex 2

Figure 10 – The global coffee value chain: From tree to cup



Source: UNCTAD secretariat.
Photo credit: thecoffeeofficina.com

cost- and time-effective but produces a poor grade of coffee. It is commonly used in Brazil and Ethiopia (unwashed Arabica) as well as in several Robusta-producing countries.

- Mechanical harvesting: A vibrator is fixed to the trunk of the tree and shakes the ripe cherries loose. Another option is rotating brushes attached to the side of a tractor. These processes damage the trees by ripping off all the cherries, flowers and leaves at the same time. Despite huge yields, they offer poor results because they yield a mixture of ripe and unripe beans. The method is common in producing countries with large farms, particularly in Brazil and Hawaii.
- Comb to brush the trees: This method uses a comb to remove only the ripe cherries from the trees. It is time-consuming, but the quality and yields are higher.

Immediately after harvesting, the coffee must be processed.

Collecting – Collectors operate between farmers and primary processing plants or exporters. They are mostly based in an area near the coffee growers and go from village to village collecting the cherries. They buy a substantial amount of the crop in cash or by credit. In some regions, more than 80 per cent of the crop is bought through collectors. Generally, the collectors know the farmers well and have long-standing relationships with them. They play a crucial role in bulking coffee and organising the transfer to processors.[13]

Primary processing (dry or wet) – There are two basic processing methods. Dry processing (natural or unwashed process) and wet processing (washed process). In some regions, some quantities of cherries are processed at home by farmers straight off the tree. However, processing is generally performed at a coffee-washing station (i.e. a local cooperative, private plant, or estate). Each region and country processes according to its own regulations and traditions, which gives the coffee beans their unique characteristics.

Processing involves:

Cleaning the cherries from intruding elements (stones, sticks, and dirt)

Removing the **cherry pulps**

Removing the **mucilaginous** layer surrounding the beans

Drying the beans

Secondary processing (milling) – Coffee is brought to the dry mill facility and runs through a hulling machine using friction to remove the last layer of dried cherry or parchment skin from the beans. Great care is needed in this process, since the heat generated from friction can have a negative impact on quality. The beans then go through several grading, calibrating and sorting machines that separate them according to the different export qualities. In many countries, final sorting is performed by hand, often by teams of women. This activity is sometimes associated with child labour as many children work alongside their parents and siblings. If stored in the right conditions, green coffee (or parchment coffee) can conserve its flavour for approximatively one year.

Milling involves:

Removing the parchment and silver skin from the beans

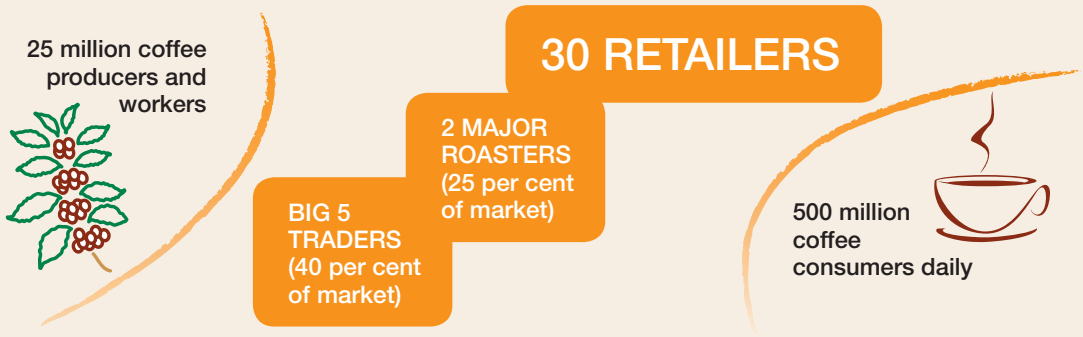
Grading beans by size and weight

Sorting beans by quality

Packing beans in jute bags or Probags

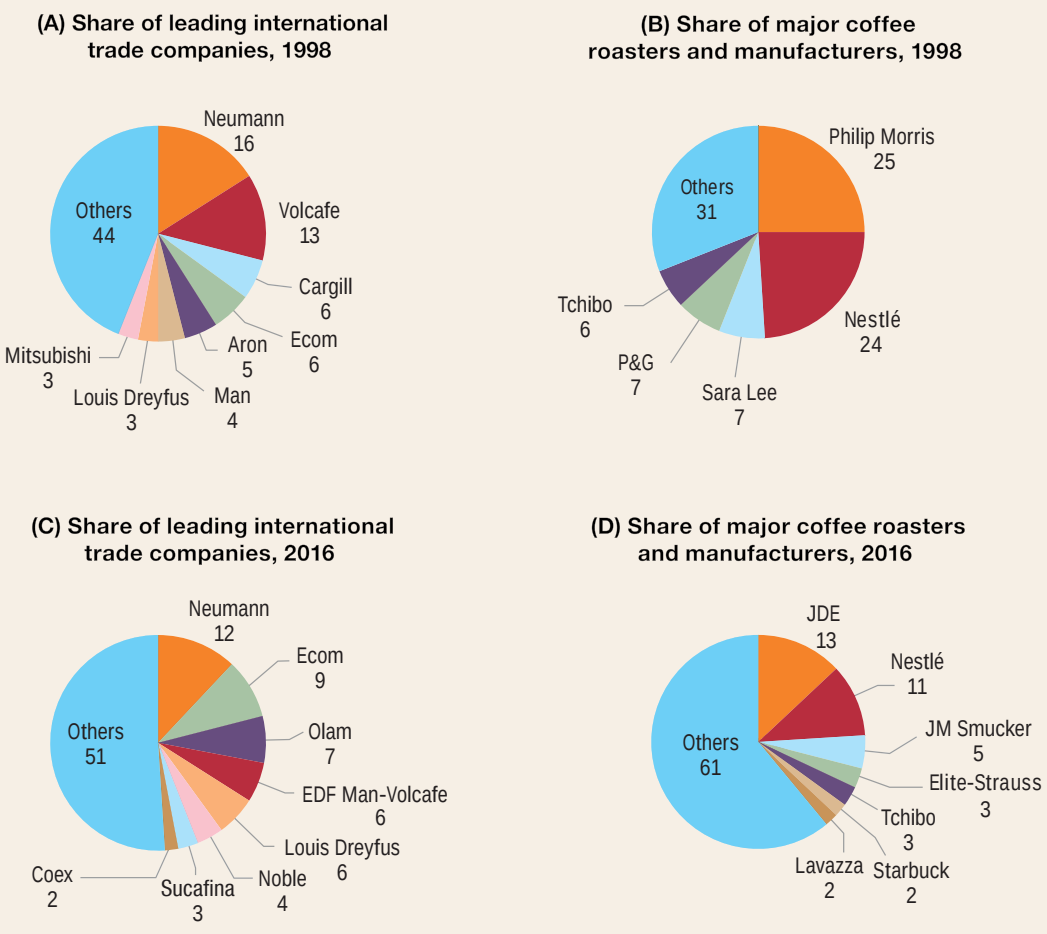
[13] The role of coffee collectors is sometimes called into question. Some consider that they take advantage of vulnerable smallholder coffee growers, paying them lower than what the market would offer. Other concerns include mixing high-quality coffee beans with the poor ones and the lack of appropriate coffee traceability.

Figure 11 – Market concentration along the global coffee value chain



Source: UNCTAD secretariat.

Figure 12 – Levels of concentration in international trade and roasting markets (per cent)



Source: Ponte (2002), ITC and updates from company websites.

International trading

After processing, over 80 per cent of green coffee production is internationally traded. This function is conducted by a variety of private agents: dealers, brokers, specialized traders/exporters, and importers, large importing roasters and retailers of consuming countries. They are the link between producers and consumers. Their function is to buy from producers when the latter need to sell, finance the stocks as required, process as needed, deliver to customers according to their requirements, and manage the risks involved along the value chain (Gibbon, 2014).

One major characteristic of international coffee trading is its concentration in the hands of a few influential actors (figure 11).

Roasting

The green coffee bean is transformed through a high temperature process into an aromatic brown bean which will be ground and brewed for drinking. After roasting, the beans are immediately cooled either by air or water. Roasters develop different roast profiles by skillfully mixing coffees from different origins. Since each consuming market has its own taste preferences, roasters create different flavours and aromas to respond to market demand. Roasting is generally performed in importing countries because freshly roasted beans must reach the consumer as quickly as possible. Under good storage conditions, roast coffee will conserve its flavour for six months to one year.

The roasting segment is highly concentrated (figure 12), with many roasters controlling the marketing and distribution of their products.

Retailing

There are different kinds of retailers – supermarkets, restaurants, bars and coffee shops – which connect roasters with coffee consumers. Of these, supermarket chains account for 70–80 per cent of coffee consumption. They source the coffee from the large roasters as well as from small niche roasters. Many retailers also roast and market their own coffee brands. A coffee shop culture (bars exclusively serving coffee, with free Internet access) has been expanding worldwide, making the segment highly competitive, particularly on the gourmet, specialty and certified coffee markets. Starbucks epitomizes this phenomenon: from 425 stores in the 1990s, the company expanded to 10,241 stores across the world in 2005, 16,858 in 2010 and 27,339 in 2017.[14]

2. Segmentation of the CVC

As described in the previous section, coffee passes through four major entities in the global coffee market. From farmers to international traders, to roasters and retailers, coffee is differentiated and allocated different prices along the process: the farm-gate price paid to the producer, the world price linked to the post-farm green coffee, and the retail price paid by the final consumer.

With Brazil, Colombia and Viet Nam being the main world producers of coffee, any shock to coffee production in these countries affects both the global supply and the global price of green coffee. For instance, as noted earlier, weather and climate change have been the major factors impacting Brazil's production, which in turn affects the global coffee market.

The actors involved in coffee production are fragmented, consisting mainly of many small-scale producers who constitute over 70 per cent of total coffee producers. Consequently, green coffee suppliers are price-takers and are prone to the negative effects of price volatility on international markets.

The other segments of the CVC are more concentrated, and the actors controlling these segments tend to take advantage of their market power in their interactions with suppliers, thereby perpetuating a system that has been in place since the 1990s. At that time, two companies controlled nearly one third of world coffee trade, and half of the world market for roasted and instant coffees was dominated by two major manufacturers (figure 12). Even though new actors have entered the coffee trading and roasting businesses, these market segments remain relatively concentrated. In 2016, the five largest international coffee trading companies controlled over 40 per cent of the total trade in coffee, while in the roaster market the two major operators handled about one quarter of the world market.

[14] See https://www.statista.com/statistics/266465/number-of-starbucks-stores-worldwide (accessed 23 January 2018).

At the macroeconomic level, coffee exports contribute significantly to foreign exchange earnings and to tax revenues. Although the economic importance of coffee in many coffee-exporting countries has been decreasing, in 2015, the average share of coffee export earnings in total export earnings exceeded 10 per cent in Ethiopia, Honduras, Rwanda and Uganda, and was even higher than 50 per cent in Burundi (ICO, 2015; ICO Statistics).

It is difficult to obtain precise data on the shares of value captured by each stage in the coffee value chain. However, the gap between producer and retail prices has increased over time, and an increasing share of the price paid by consumers is being captured by the largest actors, particularly multinational companies. In the 1970s it was estimated that the share accruing to coffee-producing countries was about 20 per cent of the total value of the final product, while coffee-importing countries retained about 55 per cent. Between the 1990s and 2000s, the producers' share diminished to an average of 13 per cent. Latest estimates show an increase of this share to 17 per cent for the period 2011–2016 (figure 13).

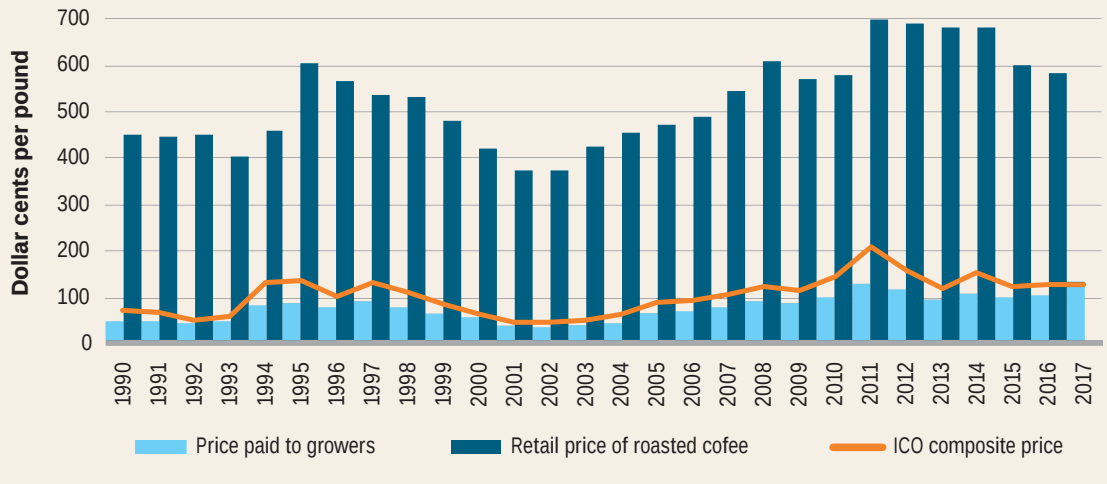
High price volatility, as discussed earlier, has resulted in large variations in producer prices, which have often fallen below the cost of production, thus destabilizing the production system. This situation has led to the emergence of niche markets – specialty and certified coffees – that pay premiums to coffee growers. Improving the organization of coffee producers through, for example, the strengthening of coffee producer cooperatives, would enable them to better access profitable markets, increase their bargaining power and afford them a higher share of the value along the coffee value chain.

3. Distribution of income along the CVC

The total value generated along the coffee commodity chain is equal to the total amount of money spent by consumers to purchase coffee products for final consumption. This total is divided into four parts:

- Income accruing to coffee producers;
- Incomes of processors, traders and exporters, as well as revenues and taxes earned in producing countries;
- Incomes of coffee manufacturers, wholesalers and retailers, as well as taxes in consuming countries; and
- A residual category, including shipping costs, profits of shippers and financiers, and spoilage that occurs during the shipping and roasting of the coffee.

Figure 13 – Producer prices vis-à-vis retail prices of roasted coffee



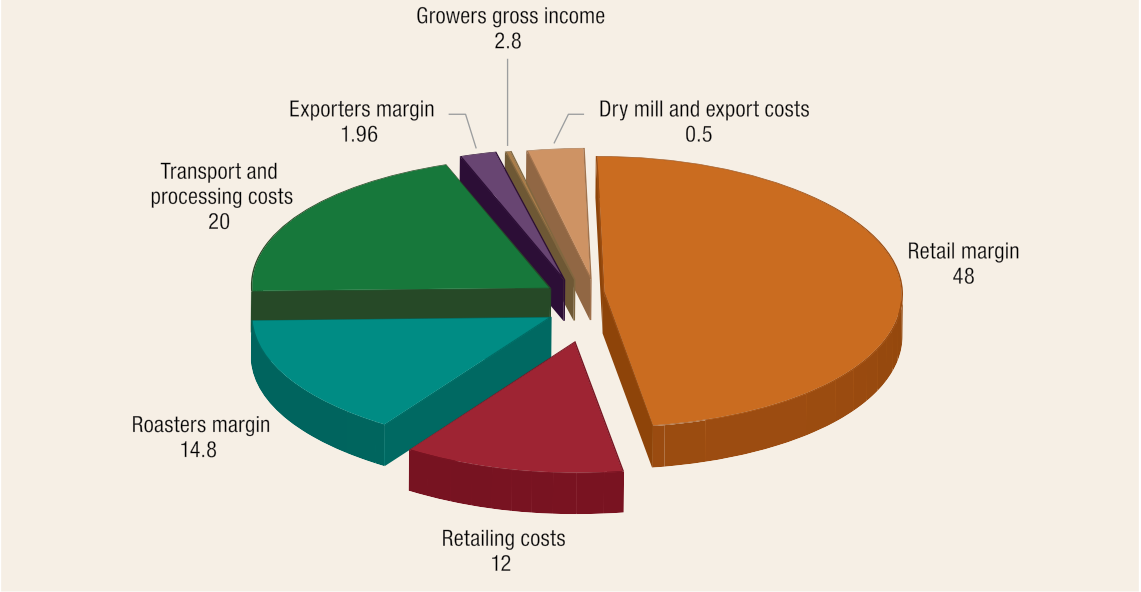
Source: UNCTAD secretariat based on data collected from ICO Statistics.

The fact that producing countries receive a relatively small share of the total value created in the CVC poses a threat to the sustainability of coffee production. Figure 14 shows an example of a distribution of value along the chain from the sale of Ethiopia's specialty coffees: Sidamo, Yirgacheffe and Harar. The share allocated to the coffee growers amounted to 2.8 per cent of the retail price in 2011. Only around 5 per cent of the global value remained in the producing country, whereas consuming countries captured the greater share of about 75 per cent.

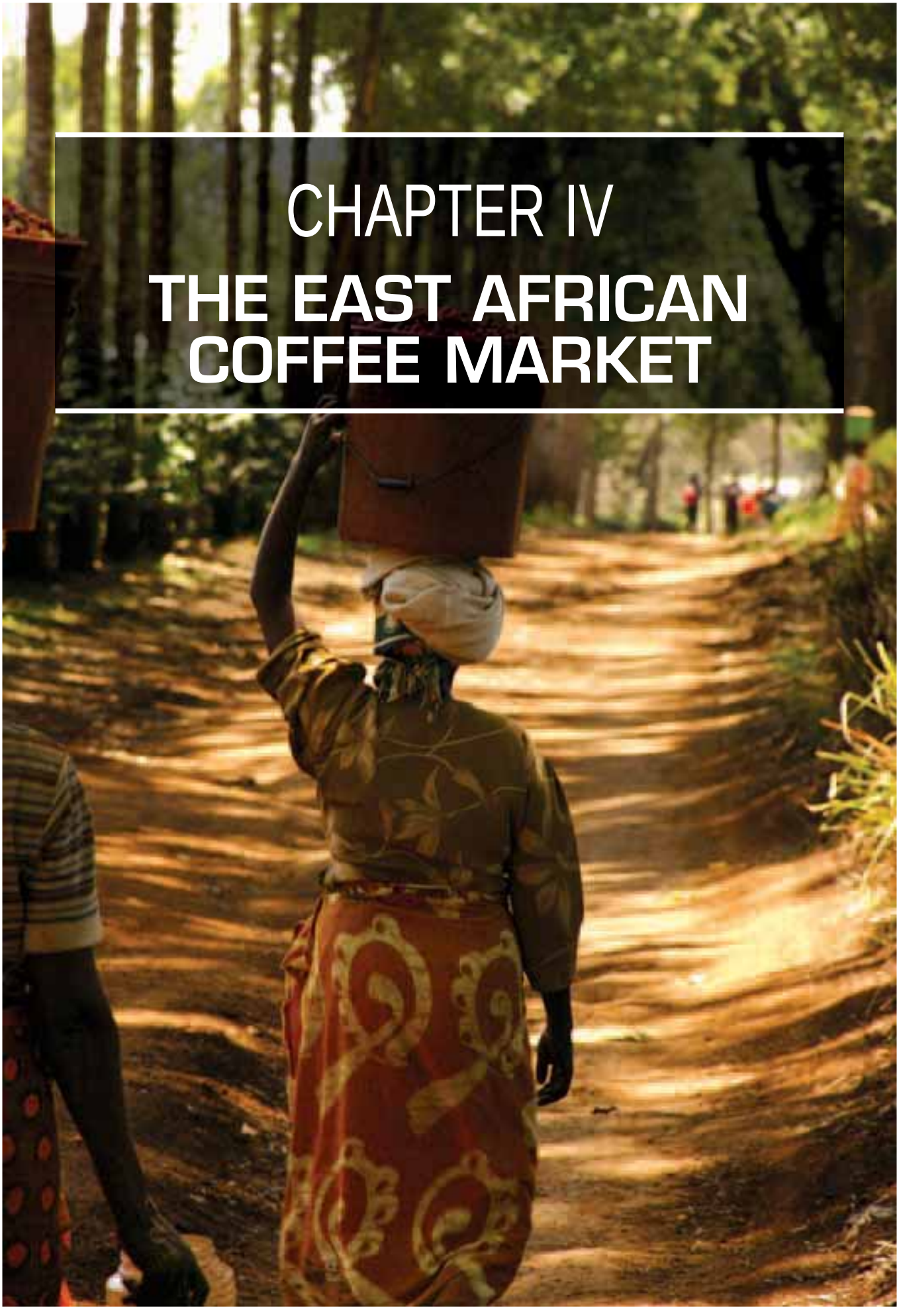
As explained previously, the global CVC is buyer-driven. The chain is driven by downstream actors who determine the standards to be used by the other actors. The retail segment captures 60 per cent of the retail value. It controls the marketing, branding and setting of standards, and influences the way profits are distributed along the chain.

The distribution of revenue along the value chain is a key issue that needs to be addressed, since it has a direct impact on income levels in coffee-producing rural areas, and on their welfare and development prospects.

Figure 14 – Ethiopian specialty coffee: Distribution of the value, 2011 (per cent)



Source: Based on data from ECF (2011)



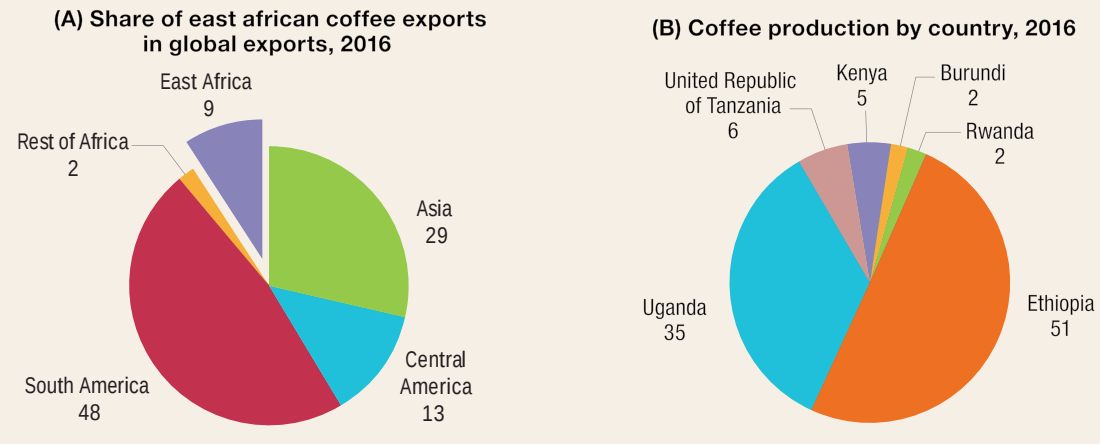
CHAPTER IV
THE EAST AFRICAN COFFEE MARKET

1. Size and market share

Over the last decade, total African coffee exports fluctuated at roughly around $2 billion in annual revenues. The volume of green coffee exported in 2016 was 17.123 million bags, or 11 per cent of world green coffee exports (figure 15), slightly higher than the volume produced by Colombia, the third largest coffee producer. There has been a general downward trend in production since the 1980s (figure 16) at a time when other regions have been increasing their output. The main reasons include the collapse of the ICA and deregulation of the coffee sector in many African countries, which has negatively affected their growers.

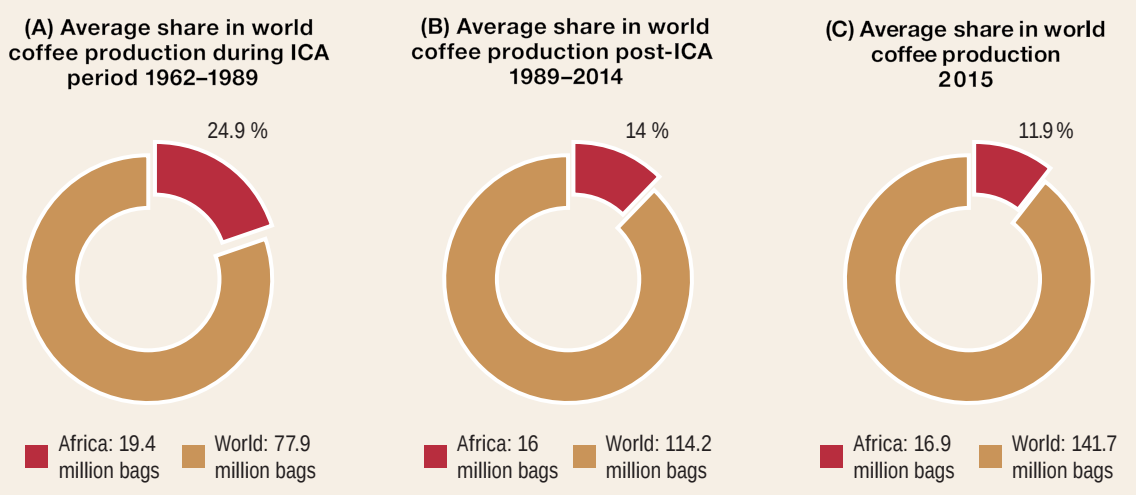
Coffee is an important commodity in Africa. The continent has the highest number of coffee-producing countries in the world, and the largest population involved in growing and processing coffee. They are mostly smallholder farmers who are highly dependent on revenues from this commodity. The latest estimates suggest that 10 million individual farmers and workers derive their livelihoods from the African coffee economy.

Figure 15 – East African green coffee production (per cent)



Source: Base on data from ICO Statistics

Figure 16 – Decline of African coffee production



Source: Based on data from ICO Statistics

The East African subregion largely dominates coffee production in Africa, accounting for over 80 per cent of the continent's total production. Ethiopia, Uganda, the United Republic of Tanzania and Kenya are the largest producers. Ethiopia and Uganda alone account for 70 per cent of total African coffee exports, and rank eighth and eleventh, respectively, among world coffee producers. These two countries are also the only producers that avoided the global downward trend in coffee production in Africa.

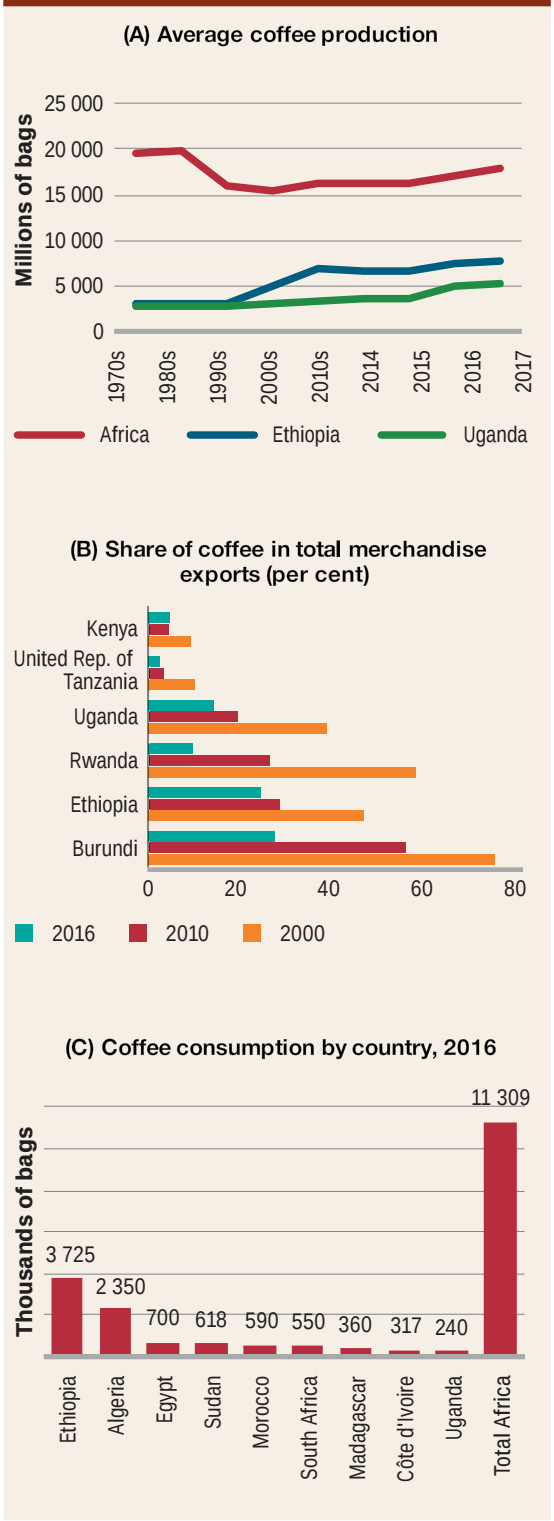
Earnings from coffee exports represent a significant share of the revenues of many East African countries. Although the importance of coffee in their economies has been diminishing over time, the average share of coffee in total merchandise exports exceeds 20 per cent for countries such as Burundi and Ethiopia (figure 17). (A more detailed analysis of the data is provided in the case studies section.)

Therefore, improving the coffee sector in these countries could have a considerable positive impact on their economic development. It could improve the socioeconomic conditions of very vulnerable small farmers whose income are highly dependent on coffee.

East Africa is endowed with ample land and other natural conditions (soil, altitude, rainfall) conducive to coffee growing. Indeed, East African countries produce a range of distinctive Arabica and Robusta coffees, and have gained a reputation for the quality of their coffee, including many specialty coffees. For example, Ethiopia is renowned for its unique Yirgacheffe, Sidamo and Harar Arabica varieties. Kenya's fine Arabica beans, grown at high altitudes near Mount Kenya, are highly demanded. And the quality of Burundi's renowned Kayanza coffees is regularly acknowledged through the large number of international awards they have attracted. Also, the Kilimanjaro coffees (coffee grown in Kilimanjaro and the southern highlands of the United Republic of Tanzania) are uniquely positioned in the Japanese market (Hoebink et al., 2014).

Although domestic consumption in the region has been rising, it remains negligible, except for Ethiopia where there is a well-established tradition of coffee drinking. Indeed, more than 40 per cent of its production is consumed locally. Total consumption in Africa reached 11.3 million bags in 2016, the main consumption markets being Ethiopia, northern African countries, South Africa and the Sudan.

Figure 17 – Coffee production and exports of selected East African countries



Source: ICO Statistics, Worldstopexports.com

2. Coffee farming in East Africa

Area devoted to coffee growing

Coffee is grown mainly on small plots of land, varying from half a hectare to 10 hectares per farm (ICO, 2015). Large plantations and coffee estates constitute a small proportion of farms (table 2). Estate farms are non-existent in countries such as Burundi, but in Kenya they account for 40 per cent of the country's total coffee production, whereas in the United Republic of Tanzania, the estate sector represents less than 10 per cent of total production. Since most coffee plantations were established more than 40 years ago, their productivity today is very low. This is compounded by the fact that over 90 per cent of faming is handled by poor smallholder growers with limited access to know-how, financial resources and other inputs.

An ageing population is another characteristic of coffee farming in Africa. The sector suffers from migration from rural areas, especially that of young and educated people. Those leaving do not seem to perceive the benefits of engaging in coffee production as they observe how the generations before them who have relied on coffee farming have been struggling to meet their basic needs.

Cost of production

Coffee farming is a labour-intensive activity accounting for 70 per cent of the total cost of production (ICO, 2015). Due to changing rural demographics, smallholder farmers must hire labour to support their farming needs that were traditionally handled by the family. In addition, fertilizers and pesticides, when used, are significant determinants of the cost of production. However, the true cost of production is hard to assess, as the various inputs are poorly recorded and measured. According to ICO (2015), the average cost of production for Burundian smallholder farmers who practice good agricultural techniques is between $0.50 and $0.57 per tree.

3. Market concentration and dynamics

The evolution of coffee markets in East Africa has taken place in the context of international deregulation in the 1990s and further liberalization of domestic coffee markets during the 1990s and 2000s. The consolidation of the international trade and roasting segments strategically boosted the power of multinational companies in the producing countries.

Even though each East African country has its own specific coffee exporters (see table 3), a few multinational companies play an important role in sourcing coffee from several countries in this

Table 2 – Key statistics on coffee farming in East Africa

	Area under coffee cultivation ('000 of hectares)	Average farm size per house-hold (hectare)	Total number of coffee farmers and workers (million)	Coffee exports (thousands of bags) 2016	Average yield of coffee farms (kg/ha) 2016
Burundi	60		0.80	258	258
Ethiopia	509		2.75	7 100	837
Kenya: Small scale farms	96	1-2	0.70	454	234
Kenya: Estates	64	15-50	0.004	329	308
Rwanda	42		0.75	220	314
United Republic of Tanzania	275	0.5	0.45	782	170
Uganda	282	0.2	1.77	4 900	1 042

Source: UNCTAD secretariat based on data from ICO Statistics, ITC Statistics, National agricultural Export Development Board (NAEB), Tanzanian Coffee Research Institute (TaCRI), Tanzanian Coffee Board (TCB), Uganda Bureau of Statistics (UBoS), Uganda Coffee Development Authority (UCDA), Agence de Régulation de la Filière Café (ARFIC), AFCA.
Note: The table uses the most recent available data.

subregion (see table 4). For example, Olam and Sucafina are active in most countries listed in table 3. The internationalization of coffee sourcing through the strong involvement of international companies in coffee buying may also contribute to producer price volatility, given that these companies may adjust their strategies to fit their own interests, which may not necessarily coincide with those of producers or the governments in the countries where they operate.

Table 3 – Leading coffee exporting companies in East Africa

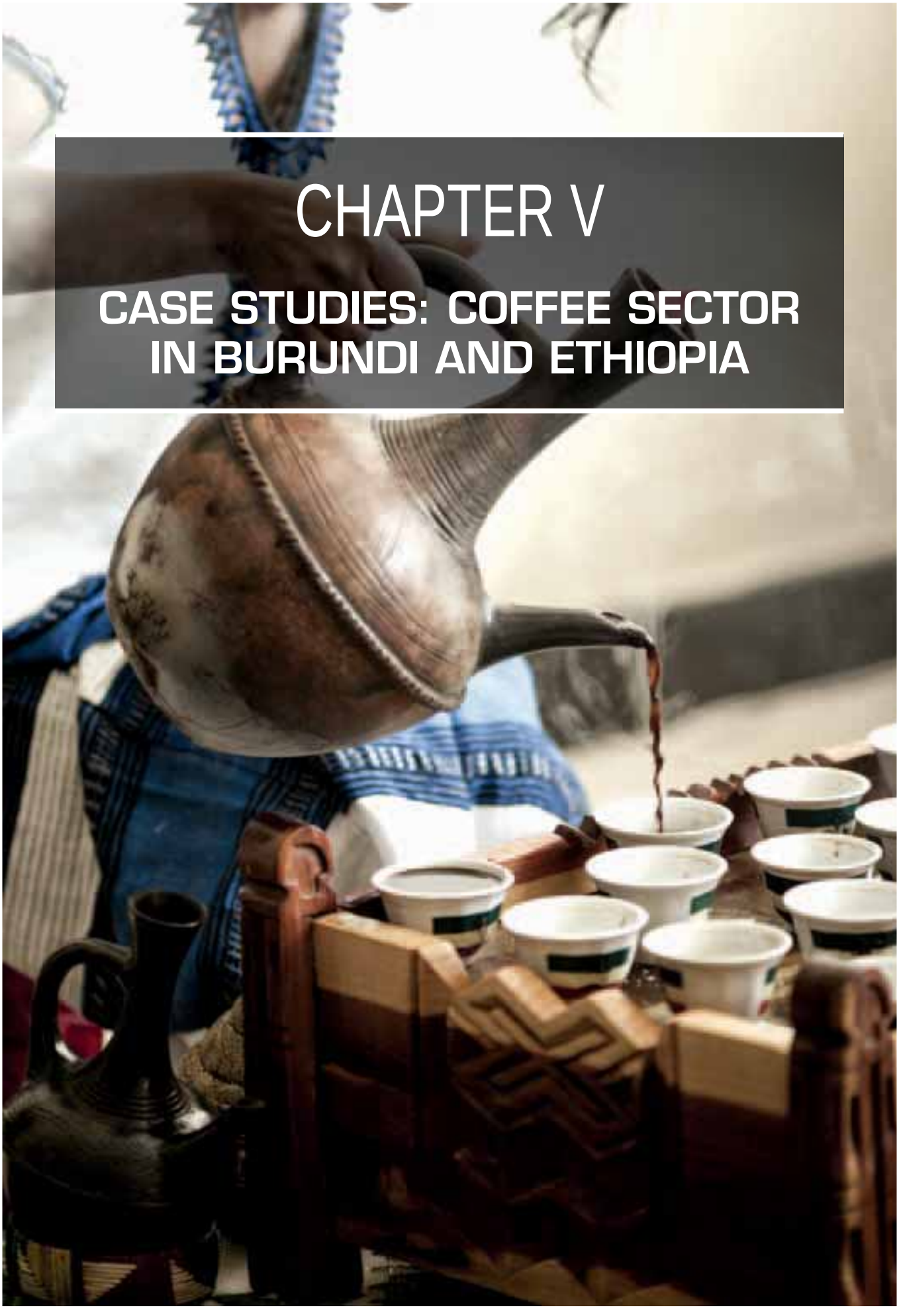
Country	Companies
Burundi	Bucafe (*Sucafina*), Olam, Sogestals, Consortium des coopératives de Café (COCOCA), Louis Dreyfus, Ecom
Ethiopia	Horra Trading, Oromia Coffee Farmers Cooperative Societies Union Ltd, Aleta Land Coffee, Mullege Coffee Exporters
Kenya	Rashid Moledina & Co (Msa) Ltd, KCCE, Dormans, Ibero (K) Ltd (*Neumann*), Kenyacof Ltd (*Sucafina*)
Rwanda	Rwacof (*Sucafina*), Coffee Business Center Ltd, COOPAC, ENAS CAFFEX, Misozi Coffee, Rwanda Trading Company, Dormans,
Uganda	Ugacof (U) Ltd (*Sucafina*), Kyagalanyi Coffee Ltd (Volcafe), Olam (U) Ltd, Ideal Commodities, Ibero (U) Ltd, Export Trading Company, Kawacom (U) Ltd (Ecom), Besmark Coffe Co. Ltd
United Republic of Tanzania	Tanzania Instant Coffee Co. Ltd, Burka Estates Ltd, Ibero Coffee (T) Ltd (*Neumann*), Tailor Winch(T) Ltd (Volcafe), Dorman (T) Ltd, Cotacof Ltd *(Sucafina*),Tembo Coffee Company

Source: UNCTAD secretariat based on data from ITC Statistics, AFCA, UCDA, ARFIC, TCB, NAEB.
Note: The companies that are wholly-owned, majority-owned, partially-owned, or equity investment, by foreign international companies *are followed by the indication of these owners' names in italics and brackets, unless it is clearly reflected in their corporate name.*

Table 4 – Leading international coffee buyers in East Africa

	Headquarters	Presence	World market share (per cent)
Neumann Kaffee Gruppe	Germany	Burundi, Kenya, United Republic of Tanzania, Uganda	11
Ecom Agro Industrial	Switzerland	Kenya, Uganda, Burundi, Ethiopia	10
Olam	Singapore/United Kingdom	Burundi, United Republic of Tanzania, Uganda, Rwanda, Kenya, Ethiopia	7
Volcafe (ED&F Man)	Switzerland/United Kingdom	Kenya, United Republic of Tanzania, Uganda, Ethiopia	6
Louis Dreyfus	Switzerland/France	Burundi, Uganda, Kenya, United Republic of Tanzania	6
Noble	United States		4
Sucafina	Switzerland	Burundi, Ethiopia, Kenya, Rwanda, United Republic of Tanzania, Uganda	3

Source: UNCTAD secretariat based on data from ITC Statistics, AFCA, UCDA, ARFIC, TCB, NAEB.



CHAPTER V

CASE STUDIES: COFFEE SECTOR IN BURUNDI AND ETHIOPIA

1. Burundi

Background

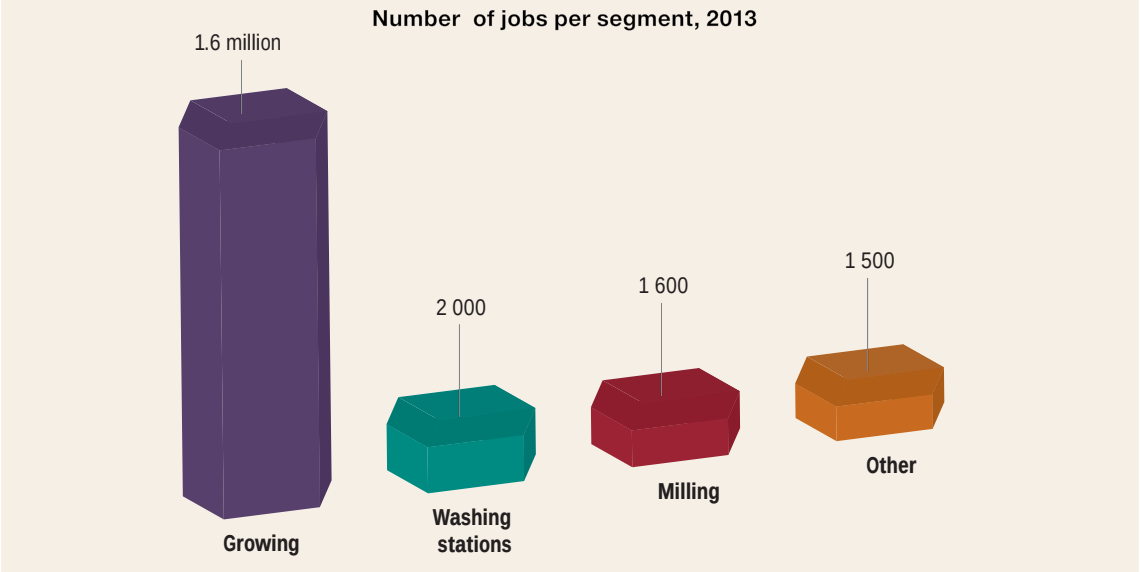
Burundi is a small landlocked country with a land area of 27,834 square kilometres. Coffee is strategic to its economy, accounting for more than two thirds of its total export revenues. It employs between 600,000 and 1.6 million rural people during the crop seasons (figure 18), and overall it provides direct and indirect subsistence income to about one third of the country's population.[15]

Introduced in the country in the 1920s, coffee from Burundi is among the highest quality coffees in the world. The coffee sector underwent several reforms, the turning point being at the beginning of the 1980s with the strategic development of the coffee wet mills industry that enabled the country to export higher quality coffee. Thereafter, exports increased, peaking in 1994 (at 39,840 tons). In the early 1990s, new reforms were introduced when the Government engaged in the privatization, deregulation, restructuring and liberalization of its coffee sector following implementation of structural adjustment policies advocated by the World Bank and the International Monetary Fund (adopted by Burundi since 1986). However, there were no significant results because of various constraints (ageing trees, limited access to inputs, inadequate provision of extension services, weak infrastructure and particularly prolonged political instability).

In 2009, the privatization of several primary processing units (coffee washing stations and drying mills) and the liberalization of the coffee sector opened the processing and export of green coffee segments to both domestic and foreign direct investments. To date, the process is still incomplete, with several coffee washing stations remaining State-owned. Despite these measures, production has been declining over time, mainly due to outdated production techniques, inefficient support to producers, and price volatility. Burundi's smallholder coffee growers and their workers are the most poorly paid among East African countries. Sometimes, their revenues are so small that they are below the cost of production. This has led several coffee growers to uproot their coffee trees, engage in intercropping, or simply shift to other activities. However, with liberalization, Burundi's coffee operators have gradually oriented their activities towards the production and trading of specialty coffees.

[15] Note: According to the Institut de Statistiques et d'Etudes Economiques du Burundi (ISTEEBU), in 2016 Burundi had 1.25 million households of which 600,000 to 800,000 grew coffee. Given that the average family size was 4.7 people per household, it is estimated that 25–34 per cent of the population is directly or indirectly involved in the coffee sector.

Figure 18 – Burundi coffee sector: employment overview



Source: UNCTAD secretariat; Bamber et al., 2014; and Association Interprofessionnelle du café du Burundi (INTERCAFE).

Importance of coffee

Coffee is Burundi's main export product, contributing, along with tea, 90 per cent of its foreign exchange earnings (Deloitte, 2016). Coffee exports (in value terms) account for one third to more than two thirds of total exports of the country, depending on the year. In 1990, coffee represented as much as 54 per cent of total merchandise exports, 89 per cent in 1997, and 37 per cent in 2006. In 2016 that share dropped to 27 per cent as a result of price developments and export diversification (including a greater share of gold in Burundi's total merchandise exports, which reached 39 per cent in 2016) (Simoes and Hidalgo, 2011).

Coffee is grown almost exclusively on very small-size farms – on average 0.5 hectares per farming family – and is mixed with other food crops, which makes it difficult to estimate how many farmers and to what extent they rely on coffee for their income. Most of these smallholdings have only a few scattered trees – between 50 and 250 units – which constitute an average of less than 25 per cent of the farm.

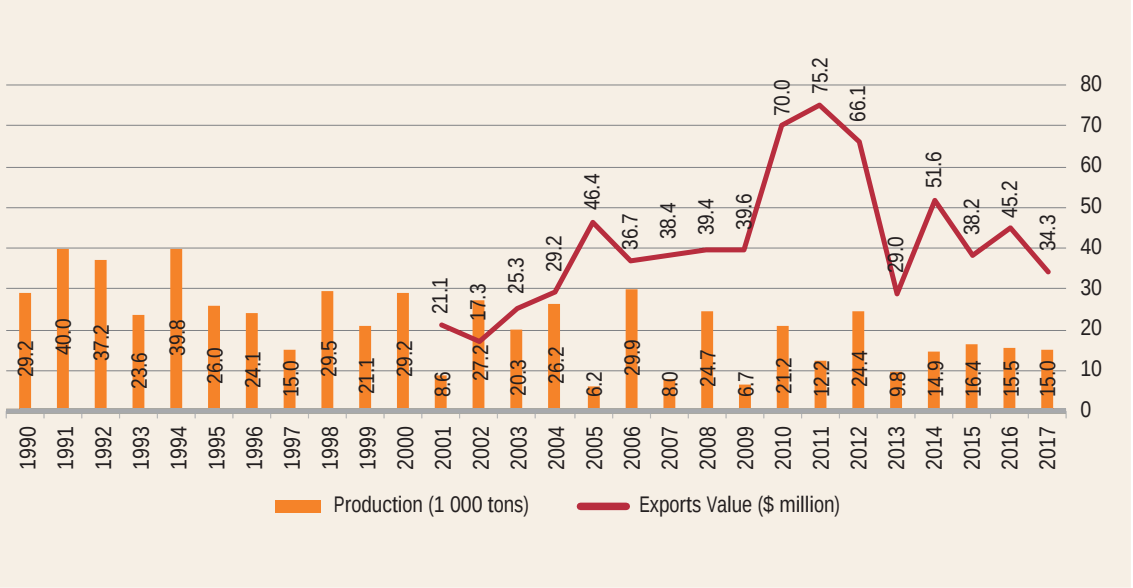
Burundi coffee production is volatile mainly because of weather cycles, ageing trees (often more than 40 years old), soil degradation, absence of adequate farming practices, and, to some extent, political instability in the country. Over the last decade, there has been a general downward trend in production (figure 19), with some high production years followed by low production years (e.g. 29,940 tons in 2006 up from 6,180 tons in 2005). Since 2001, coffee exports have declined by 6.6 per cent per year, on average.

Constraints and opportunities

Burundi has proved that it can produce good coffees appreciated by consumers. However, the country's highly fluctuating production, partly due to the low price paid to producers, does not encourage the sustainable production of high quality coffee. Other obstacles to the development of Burundi's coffee sector include the following:

- Poor soil management and the inadequate supply of organic fertilizers to growers, which affects productivity.
- Lack of appropriate support to coffee producers and processors in terms of agricultural technical knowledge and extension services specific to coffee production and post-harvest processing to enhance productivity, quality and supply chain efficiency.
- Difficulty accessing accurate market information, which leads, among other things, to high price speculation at the farmgate. The privatization and liberalization of the coffee sector increased producers' exposure to shocks from the

Figure 19 – Burundi's coffee production, 1990–2017



Source: Based on data from ICO Statistics, UNCOMTRADE, INTERCAFE.

international market without providing proper risk management support.

- Poor access to finance due, among others, to the removal of the State guarantee in 2009.
- Weak infrastructure (e.g. electricity and transportation), which negatively affects the efficiency of the supply chain, thereby increasing supply costs.

The way forward

Burundi's coffee is soft, and therefore deteriorates quite rapidly. According to many experts, Burundian coffee can be of very high quality when processing is carried out properly. In this regard, traceability is essential to provide information on quality, varieties, environmental conditions, cultivation practices, processing systems, storage and transport conditions, all of which contribute to determining how much a consumer is ready to pay for an exquisite coffee.

The availability of suitable inputs, rehabilitation of plantations, and better management of soil will increase the quality and productivity of coffee in Burundi. Achieving these objectives will require combined efforts by the Government of Burundi and all the other stakeholders.

Stimulating and strengthening the bargaining power of smallholder farmers through cooperative organizations should be encouraged. This could help make the supply chain more effective, improve the quality of the coffee and increase its output. Private investment, including through public-private partnerships, should be encouraged to modernize the sector and make it more competitive. In this regard, Burundi should invest in market intelligence that helps stakeholders to better understand the factors associated with the growing demand in importing niche markets and build on the country's reputation as a prized source of specialty coffees.

2. Ethiopia

A major producer and consumer

Ethiopia has a long history of coffee production and consumption, which has made the country the largest producer and consumer of coffee in Africa, and the tenth largest coffee exporter worldwide.[16] Coffee is Ethiopia's main export commodity, accounting for 41.2 per cent of the country's total merchandise exports in 2016.[17] However, this share has declined over time due to an increase in other exports, including gold, cut flowers, textiles and leather products. Coffee also plays a vital role as a source of income for about one fourth of the country's population who rely on coffee production, processing and export activities.

Production system

Ethiopia grows a wide range of Arabica coffees most of which are trademarked varieties, with the rights owned and protected by the Government of Ethiopia. The main growing regions are Harar, Limmu, Sidamo-Yirgacheffe, Djimmah, Bebeka-Tepi, and Gimbi-Lekempti.

The coffee is cultivated in four different ways: (i) forest coffee,[18] which grows under the shade of natural forest trees, often with no defined owner and requiring minor maintenance; it accounts for about 10 per cent of the country's total coffee production; (ii) semi-forest coffee, which is grown in forest conditions with little maintenance by farmers (representing 35 per cent of total production); (iii) garden coffee which is grown by farmers in their land (representing 45 per cent of total production); and (iv) plantation coffee grown on large commercial farms (representing 10 per cent of total production).

Most of the coffee (90 per cent) is produced by small-scale farmers and cooperatives on less than one hectare of land per farm, and the remaining 10 per cent is produced by some medium-sized producers and large-scale plantations.

Dynamics of the sector

Over the past decade, the Ethiopian coffee sector has performed well both in terms of quantities exported and revenues generated (figure 20). The average value of coffee exports grew threefold between 2001–2010 and 2011–2016, partly associated with ever-increasing prices for this commodity, but also with the quantities exported, which grew by 60 per cent.

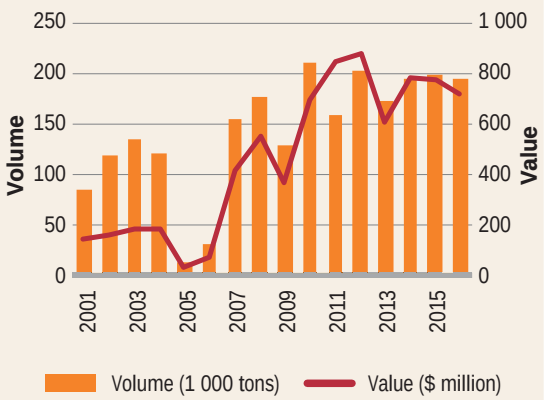
Ethiopian coffee is exported to about 50 countries around the world. The European Union is the most important destination (figure 21). At country level, Germany is the destination for about one third of Ethiopia's total coffee exports, followed by Saudi Arabia which accounts for 12 per cent.

[16] ITC Statistics

[17] UNCOMTRADE

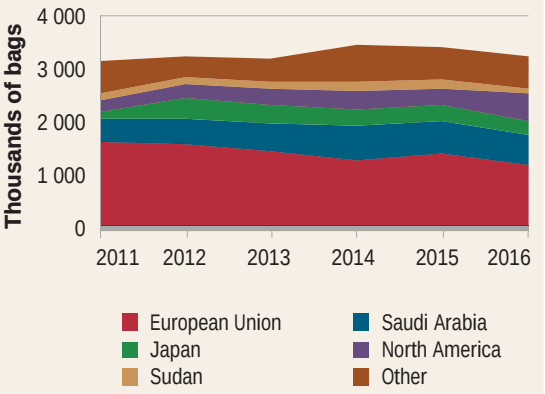
[18] Note: Ethiopia is the only country that produces forest coffee. Eight areas are identified as such, three of which are registered by UNESCO as ecological biosphere reserves.

Figure 20 – Ethiopia's coffee exports, 2001–2015



Source: UNCTAD secretariat based on data from ICO Statistics and UNCOMTRADE.

Figure 21 – Main destinations of Ethiopian coffee, 2011–2016



Source: UNCTAD secretariat based on data from ICO Statistics and UNCOMTRADE.

Constraints and opportunities

Constraints

- The main issue for the Ethiopian coffee sector remains the low and inconsistent quality of the coffee. Major reasons for this are the prevalence of pests and diseases, climatic variability, inadequate agricultural practices, insufficient training of coffee producers, and weaknesses in the organization and management of the value chain.
- Since the introduction of the Ethiopian Commodities Exchange (ECX), exporters (except commercial private farms, State farms and cooperatives) can no longer sell directly to international buyers; they must sell their coffee through the ECX (box 2). To some extent, this rigidity favours large stakeholders to the detriment of smallholder producers who lose the opportunities associated with direct sales to consumers, for example.
- The weakness of the coffee cooperative movement.
- The lack of investment in production, processing and marketing capacities.

Opportunities

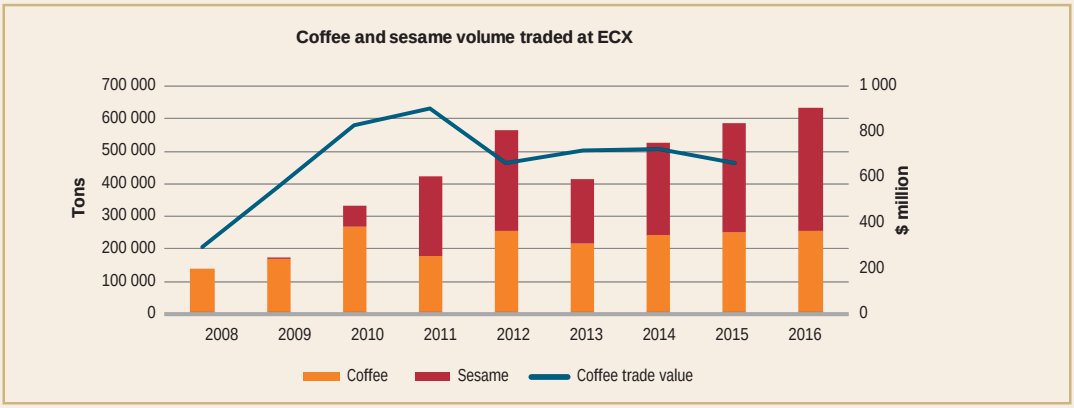
- Increasing the volume for specialty coffee. Ethiopia has a natural abundance of coffee varieties, thus enabling it to benefit from market and product differentiation. Some studies suggest that two thirds of Ethiopian coffee could qualify as specialty.
- Ethiopia has a significant comparative advantage in the production of organic coffee, with over 90 per cent being de facto organic.
- Ethiopia's strong image as the country of origin of coffee presents a favourable opportunity to gain access to new markets.
- There is a well-established domestic coffee consumption culture.

Box 2 – The Ethiopia Commodity Exchange

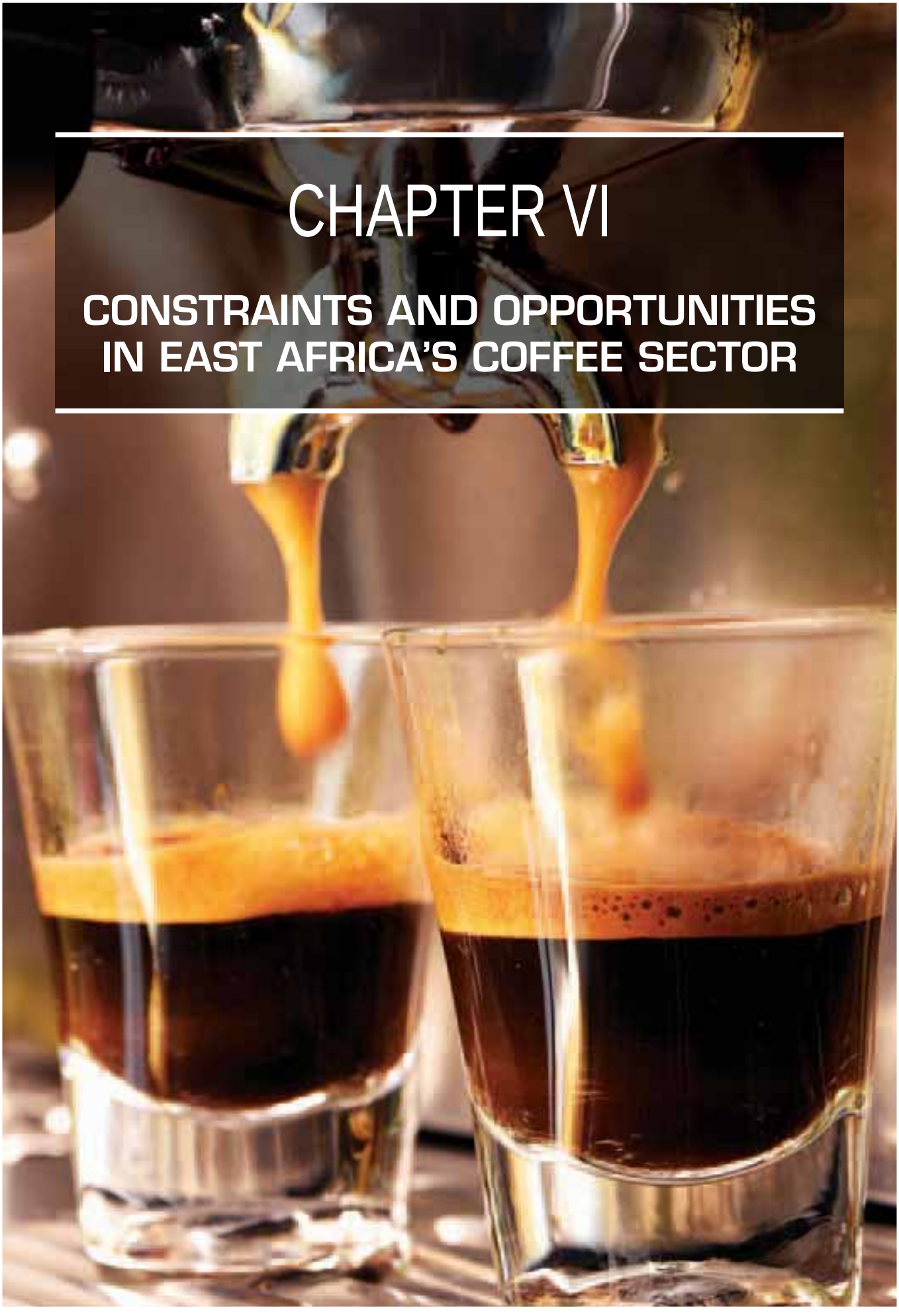
The Ethiopia Commodities Exchange (ECX) is a good example of a functioning multi-commodity exchange in Africa. The ECX was launched in 2008 as a public-private partnership that provides an efficient and reliable trading platform to assure all stakeholders the security they need to settle transactions. It provides trust and transparency through market data dissemination, and through clearly defined rules of trading, warehousing, payments, delivery and dispute settlement. Over almost a decade of operation, the ECX has traded nearly 5 million tons of commodities and linked more than 3.5 million farmers to markets.

With the inception of the ECX, the Government of Ethiopia suspended the traditional coffee auction system and made it mandatory for all coffee trading to be conducted through the exchange. Coffee farmers are required to sell their coffee at designated primary markets where only certified buyers can make purchases. Similarly, coffee processors must receive approval to use designated warehouses, where their product is graded for either export or sale on the domestic market. The volume and value of coffee transactions accounts for an average of 46 per cent and 66 per cent, respectively, of total commodities traded at the exchange, making coffee an important commodity for the platform.

The ECX is viewed as having been successful in modernizing the country's economy and linking smallholder farmers to markets. However, there has been very little systemic analysis to determine whether the ECX is in fact the driving factor of improvements in Ethiopia's agricultural markets.



Source: Ethiopia Commodity Exchange, http://www.ecx.com.et (accessed January 2018); Gabre-Madhin, 2012.



CHAPTER VI

CONSTRAINTS AND OPPORTUNITIES IN EAST AFRICA'S COFFEE SECTOR

1. Constraints

Based on the analysis in this report, some challenges facing East African countries' coffee sector are highlighted below:

Quality and productivity

The share of Africa's supply to global coffee production has declined dramatically over the past 50 years. In most African countries, coffee yields are low, and the quality of coffee is inconsistent and declining. Its deteriorating quality results from progressively disappearing high quality cultivars in favour of poor yielding seedlings, but also from a lack of adequate mechanisms of resilience vis-à-vis droughts, insects and other pests and diseases. Coffee farmers are severely limited by poor capacity and awareness of modern farming techniques, harvesting and post-harvesting practices. Additional constraints are ageing trees, degraded soils and negative impacts of climate change.

Costs of production

Producing coffee entails having land, coffee seedlings, farm labour and inputs, processing and storage infrastructure, as well as other supporting infrastructure (e.g. transport, energy and telecommunications). These elements are limited in most of the countries analysed, thus adversely affecting the revenues of farmers and producing countries.

Low and volatile prices

The lack of knowledge and technical capacity to predict the behavior of the coffee market is a key source of vulnerability of coffee producers. They make decisions based on information available at the time, but unforeseen fluctuations in the market cause serious harm to producers.

Access to markets and services

The limited access to information on consumer demands and preferences diminishes the capacity of coffee producers to take full advantage of opportunities associated with their crop. This environment of asymmetric information between producers and consumers penalizes producers who are unable to make informed decisions regarding investment, risk management and technology adoption.

Environmental effects

Negative impacts of climate change (i.e. extreme weather conditions, resilient pests and diseases) threaten coffee supply in the medium to long term. At the same time, some coffee production practices may contribute to environmental degradation through inappropriate use of water and chemical inputs, as well as other unsustainable practices. As consumers are increasingly concerned with reducing their carbon footprint, some practices will need to change. In this regard, producers who can adopt sustainable production practices will reap the benefits associated with so-called sustainable coffees.

2. Opportunities

Maximizing the value and volume of raw coffee

East Africa's suitable ecosystem – varieties of coffee, volcanic soil and geographical location near the Equator – offers the subregion's coffee producers opportunities to increase the value and volume of their output. This can be achieved through, among others, building national capacities including appropriate infrastructure, proper training, improvement of coffee plant varieties, ensuring protection against pests, diseases and contamination during storage, producing a consistent quality of coffee without defects, promoting the use of good and better agronomic practices, research and development of new technologies, and expanding production capacity.

Enhancing strategic governance and coordination in coffee supply

One way to ensure sustainability of the CVC is through a better international and regional coordination mechanism. This is crucial for countries producing high quality coffees, particularly with respect to pricing issues. Increasing these countries' negotiating power could raise the revenues they derive from coffee.

Stimulating domestic consumption

Developing domestic consumption would make producers more aware of consumer demands in terms of quality, so that they could adjust different parameters along the production process. Moreover, the expansion of the domestic market would be an alternative to the unpredictable export market and would give a boost to a local roasting industry.

Harnessing the benefits from niche markets

Exploiting high value niche markets such as those for specialty coffees, certified fair trade and organic coffees, terroir coffees, single origin or origin branded coffees offers opportunities for East African countries and other countries that produce small quantities of high-quality coffees. These are initiatives that can help bring a diversity of buyers to the region and encourage direct trade which would ensure higher and more stable revenues to smallholder farmers.

Promoting a sustainable coffee economy

The growing number of initiatives for coffee certifications has the potential to improve the position of smallholder farmers in the global CVC. These new forms of organization encourage stakeholders to engage in long-term relationships and direct transactions. They also foster good agricultural and processing practices. The consequent improvement in quality and chain efficiency in turn ensures a fairer income for the farmers.

3. Conclusion

This report highlights the role of each of the main actors of the CVC, with a focus on smallholder farmers. It also shows that the CVC is controlled by a limited number of actors in consumer markets, which raises the issue of sustainability of supply, given the limited benefits accruing to producers. Indeed, green coffee buyers (exporters, traders, roasters and retailers) continue to adopt business strategies that enable them to capture most of the value, while some producers sink into poverty.

The study highlights the shift in power from producers to consumers that followed deregulation and liberalization of the coffee sector in the 1990s. Indeed, the phasing out of the ICA explains to a large extent the subsequent fall in producer prices. Large adjustments are needed to ensure supply sustainability, particularly in a context of a predicted increase in demand over the next few decades. East African countries should be in the vanguard of these changes, given the region's untapped potential to produce specialty coffees and the importance of the coffee sector for the households and governments of these countries.

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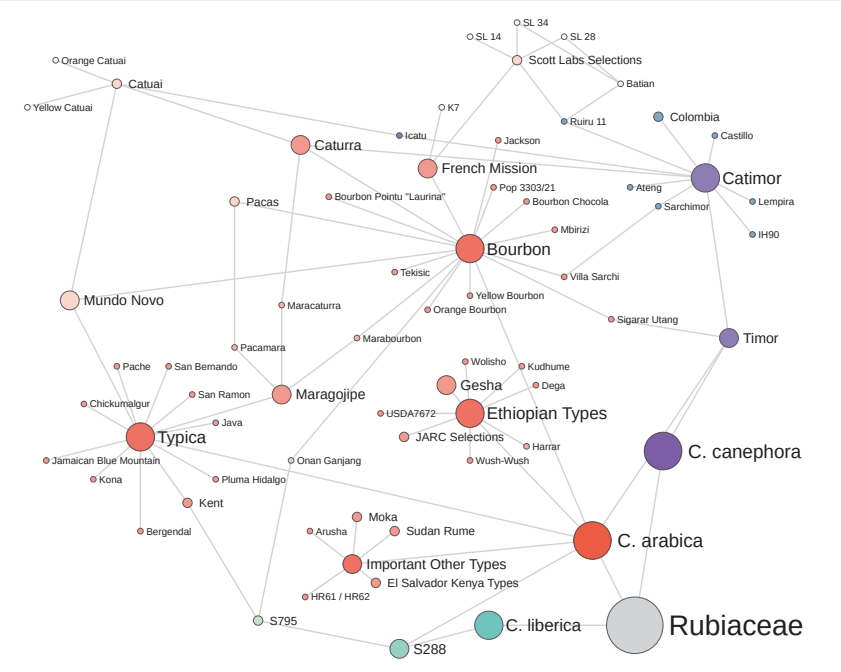
Annex 1. Coffee species and varieties

Coffee species and varieties

Coffee belongs to the family Rubiaceae in the genus Coffea. The latter contains over 100 coffee species, but only three are used to produce the beverage: Coffea Arabica (**Arabica coffee**), Coffea Canephora or Coffea Robusta (**Robusta coffee**), and Coffea Liberica (**Liberica coffee**). The first two are widely produced and commercialized, representing respectively three quarters and one quarter of the world's coffee production and exports. Ethiopia is considered to be home to the most genetically diverse strains of Coffea Arabica. This has led botanists and scientists to agree that Ethiopia is the centre of origin and diversification of the Arabica plant (Engels et al., 2008) while Coffea Canephora is found in central west Africa and Coffea Liberica in west Africa.

Wild Arabica from Ethiopia, which was cultivated in Yemen from the fifteenth century, is the most common coffee species grown worldwide for consumption. It is considered superior in quality with a more subtle and aromatic flavour and less caffeine content. On the other hand, Robusta contains almost double the level of caffeine compared to Arabica, giving a more bitter-tasting and less aromatic flavour. Robusta is, however, more resilient to diseases and can be cultivated in low altitudes and warm climates, and it also tends to give higher yields. Today, Robusta is grown mainly in Asia (Viet Nam, Indonesia, India and Malaysia), Africa (Uganda, Côte d'Ivoire, the United Republic of Tanzania, Cameroon, the Democratic Republic of the Congo), and Brazil; whereas Arabica is produced for the most part in Latin America (Brazil, Colombia, Honduras, Peru, Guatemala, Mexico and Costa Rica) and in Africa (Burundi, Ethiopia, Kenya, Rwanda, Uganda, and the United Republic of Tanzania); and small crops of Liberica coffee (about 1 per cent of world coffee production) are found in Asia (Malaysia, Philippines and Indonesia).

Many cultivars have been derived from these species, and developed to increase productivity, strengthen natural resistance and improve the quality of the end product.



Source: https://counterculturecoffee.com/ learn/resource-center/coffee-varieties; Bertrand (2002).

Annex 2. Key activites and actors along the CVC

	ACTIVITIES	ACTORS
● ●	Inputs	Public, private, donors, NGOs, certifiers, etc.
●	Producing	**Small farmers:** represent more than 70 per cent of global coffee supply; self-employed, grow coffee on less than 5 hectares often together with other food crops, rely on family members to help during harvest, deliver to collection points or coffee washing stations, sell to intermediaries (collectors) or processors (wet mills). **Cooperatives:** smallholder farmers get together to form cooperatives to have a stronger bargaining power, achieve economies of scale by aggregating production, and benefit more from technical assistance and financing. Cooperatives often also serve as processors and exporters. Certified coffee sourcers usually buy from cooperatives. **Estates/plantations:** Medium- to large-scale, own facilities, employ workers.
●	Collecting	**Collectors (intermediaries – domestic traders):** Small farmers sell their produce to intermediaries called collectors, who in turn sell the coffee to wet mill operators or exporters. Collectors gather coffee cherries by either driving around in pickup trucks or setting up collection centres. They buy from small producers at a relatively low price, often lower than the minimum price set by the regulator.
● ●	Processing	**Wet mills (primary processing):** receive (weigh and buy) coffee cherries then depulp, ferment, grade, and dry the beans. If not handled on-site, the graded coffee bean is sent to the dry mill for further processing **Dry mills (secondary processing):** receive or buy coffee parchment beans from farmers or wet mills. Dry mills run the final stage where parchment is removed, and beans are sorted and graded by size/weight and checked for quality. Green coffee is then sold to local buyers or exporters
●	Exporting	**Exporters:** receive or buy green coffee beans from millers, farmers and cooperatives. They arrange for sale and shipment of the green coffee to importers or roasters. They are either independent agents in the supply chain or own wet and dry mill facilities. They can also be a local company or part of a multinational corporation. An exporter provides two-way value-added services for both buyer and supplier such as controlling coffee quality, sampling of coffee, providing pre-crop financing and preparing documentation for export. Roasters rarely source beans directly from producers but rather through exporters.
●	Importing	**Importers:** buy green coffee from exporters, farmers and cooperatives, and sometimes from other importers
● ●	Roasting	**Roasters:** buy green coffee from Importers. They can be importers themselves, buy at origin and organize logistics to their location.
●	Retailing	**Supermarket chains:** play a large role, accounting for 70–80 per cent of the overall coffee consumption. **Food service industry:** restaurants, bars, offices, vending machines account for 20 per cent of consumption. **Specialty coffee bars:** a fast-growing segment (e.g. Starbucks has 425 stores in 1990 and now 27,339 stores worldwide in 2017).
●	Consumers	500 million coffee drinkers per day

● Seed ● Cherry ● Parchment ● Green ● Roasted

Annex 3. Coffee profiles in East Africa

	Burundi	Ethiopia	Kenya	Rwanda	United Rep. of Tanzania)	Uganda
Coffee Growing areas	Kayanza, Ngozi, Kirundo-Muyinga, Mumirwa, Kirimiro	Harar, Limu, Jimma, Irgacheffe, Sidamo	Meru, Kiambu, Kirinyaga, Ruiru	Butare, Nyanza, Ngoma, Lake Kivu	Mid-A: Kiliman-jaro, Arusha, Manyara, Tanga, Mbeya; Hard-A: Tarime R: Bukoba, Kagera,	Bugisu, Victoria basin, Western Uganda, West Nile
Type of coffee	A/R	A	A	A/R	A/R/O	A/R/O
Process Method	Wet, Dry, Natural,	Wet, Dry	Wet		Wet, Dry	Wet, Dry
Trade System	Direct Sale	Direct Sale	Auction, Direct Sale	Direct Sale	Auction, Direct Sale	Direct Sale
Port of Export	DAR, MBA	DJI	MBA	MBA, DAR	DAR	MBA, DAR
Export to	European Union, Japan, United States, Australia	European Union, Japan, Saudi Arabia	European Union, United States	European Union, United States, Switzerland	European Union, Japan, United States, Asia, Africa	European Union
Coffee harvest seasons for each country						
Jan.		A				A/R
Feb.	A					A/R
Mar.	A			A		R
Apr.	A		A	A	R	R
May	A		A	A	R	R
June	A		A	A	R	R
July					A/R	R
Aug.					A/R	A/R
Sep.					A/R	R
Oct.		A	A		A/R	A/R
Nov.		A	A		A/R	A/R
Dec.		A	A		A/R	A/R

■ Main crop ■ Secondary crop ■ Fly crop

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