Burundi in the Coffee Global Value Chain

SKILLS FOR PRIVATE SECTOR DEVELOPMENT

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Acronyms

ARFIC	Agence Régulateur de la Filière Café (Agency Regulator of the Coffee Industry)
AFCA	African Fine Coffees Association
ABS	Agri Business Services
BAP	Burundi Agricultural Program
BOD	Biochemical Oxygen Demand
BTC	Belgian Development Corporation
C.A.F.E.	Coffee and Farmer Equity
CBI	Center for Promotion of Imports from Developing Countries
COCOCA	Union de Coopératives des Caféiculteurs (Union of Cooperatives of Coffee Growers)
CNAC	La Confédération Nationale des Associations des Caféiculteurs du Burundi (The National Confederation for the Association of Coffee Growers in Burundi)
CoE	Cup of Excellence
CWS	Coffee Washing Station
DPAE	Directions Provinciales de l'Agriculture et de l'Elevage (Provincial Directorates of Agriculture and Livestock)
DRC	Democratic Republic of the Congo
EAC	East African Community
EU	European Union
ERSG III	Third Economic Reform Support Grant
FLO	Fairtrade Labeling Organization
FONECAFE	Costa Rica National Fund for Coffee Stabilization
GDP	Gross Domestic Product
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Society for International Cooperation)
GVC	Global Value Chain
ICA	International Coffee Agreement
ICAFE	Instituto del Café de Costa Rica
ICO	International Coffee Organization
IFC	International Finance Cooperation
IFOAM	International Federation of Organic Agriculture Movements
ISABU	Institut des Sciences Agronomiques du Burundi (Burundi Institute of Agricultural Sciences)
ISAR	Rwandan Agricultural Sciences Research Institute
ITC	International Trade Center
LDC	Least Developed Country
NGO	Non-governmental Organization
NYFOB	New York Free on Board
NYSE	New York Stock Exchange
OCFCU	Oromia Coffee Farmers Cooperative Union
OCIBU	Office du Café du Burundi (Coffee Board of Burundi)
OCIR CAFÉ	Rwanda Café Authority
PEARL	Partnership for enhancing Agriculture in Rwanda through Linkages
QIA	Quality Improvement Agreement
RA	Rainforest Alliance
SCAA	Specialty Coffee Association of America
SCFCU	Sidama Coffee Farmers Coöperative Union
SCAE	Specialty Coffee Association of Europe
SMI	Supplier Managed Inventory
TCC	Tropical Commodity Coalition
US	United States
UV	Ultra Violet
USAID	United States Agency for International Development
YCFCU	Yirgacheffe Coffee Farmers Coöperative Union

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I. Introduction

Arabica coffee has been commercially grown and exported from Burundi for decades, even during periods of economic and political instability. The coffee sector is crucial to the Burundian economy, not only because it provides employment to a large number of smallholder farmers in the country, but also because the majority of the country's foreign exchange earnings derive from coffee exports. As the country continues to rebuild its economy following the end of the crisis, there is keen interest from policy makers, donors and industry actors to bolster the sector in general, and specifically to identify potential opportunities to leverage the sector for improved labor productivity and job creation for the large number of unemployed youth in the country.

Although Burundi has a long history in coffee production, changing dynamics at both the global and domestic level require a new strategy to maintain Burundi's competitiveness. Over the past two decades, since the end of quotas with the suspension of the International Coffee Agreement in 1989 (Russell et al., 2012), the global market has been characterized by dramatic price fluctuations, as a result of variations in the yield of large producing countries such as Brazil and Vietnam, speculation on the futures market, and changing demand for different coffee products. As a result, prices paid to producers have varied considerably, and at times, have even fallen below the cost of production. This has destabilized production systems, but it has also led to the emergence of niche markets driven by certification schemes and the differentiation of specialty coffees. These niche markets pay price premiums, as in the case of Fair Trade, and insulate producers to some extent from low prices.

Domestically, liberalization, which has intensified since 2009 and is set to continue in the near future, has had a fundamental impact on the sector. This has opened up the potential for investment from both private and foreign firms, investments in new improved technologies and increased direct engagement between producers and global buyers. At the same time, it has removed minimum price mechanisms that protected farmers from changes in the global markets, and allowed for the free entry and exit of actors from the sector. Relatively low global prices as well as uncertainty due to seemingly unpredictable price fluctuations, could lead to an important exodus of producers from the sector. However, because alternative employment opportunities in the country are scarce, policies aimed at diversifying the export base need to be balanced with policies targeted to maintaining and strengthening Burundi's global position in the coffee GVC.

This paper uses the global value chain (GVC) framework to understand how the global coffee industry is changing, to assess Burundi's current position in the GVC, and to identify opportunities to strengthen this position through upgrading with the goal of promoting economic development. By adopting new technologies, producing a new product or engaging in an entirely new set of activities, upgrading may allow actors in the GVC to capture greater value from their participation (Humphrey & Schmitz, 2002). Upgrading, nonetheless, is particularly challenging for actors in developing countries and often depends on making essential improvements to a wide range of institutional factors, including infrastructure, the business environment, and trade and investment policy (Bamber et al., 2013). Indeed, several reports have tackled some of these questions for Burundi's coffee sector in the past three years (UNIDO, 2013; USAID, 2013; World Bank, 2011).

One of the most critical factors in supporting upgrading that is frequently overlooked is the human capital aspect; that is, improving actors' capabilities within the chain (Gereffi et al., 2011). To be successful, upgrading strategies often require the development of new skills, such as operational knowledge of new equipment or understanding how to handle new products (Gereffi, 1999; Gereffi et al., 2005). In general, however, GVC upgrading is often undertaken without fully unpacking the skills acquisition needs or the feasibility of enhancing knowledge transfer through the chain (Morrison et al., 2008; Ramirez & Rainbird, 2010). This "black box" approach makes it difficult to develop adequate policies to support upgrading, especially in least developed

countries (LDC) and even more so in post-conflict countries, such as Burundi. In these contexts, institutions are often weakened and resources scarce, so even establishing basic education levels to support upgrading is challenging (Gereffi et al., 2011). Supplementing the existing institution-building activities in these countries with skills training and other human capital development initiatives that are tailored to specific GVC upgrading activities can be a cost-effective and efficient way to catalyze development. This paper thus has a strong emphasis on coffee workforce development, building on lessons from previous skills training programs in Burundi to make targeted recommendations for enhancing human capital to facilitate upgrading in the sector.

The paper is structured as follows: First, an overview of the coffee global value chain is presented to provide a clear understanding of the scope of the industry, how markets are structured and how changing distribution of demand and supply can alter the dynamics of the industry. Understanding these factors that are shaping the industry is essential for Burundi, as it seeks to upgrade in export markets. Second, Burundi's current position within the coffee GVC is analyzed, and three potential upgrading trajectories for the sector are identified and discussed in detail with respect to potential costs and benefits, particularly in the area of employment creation. Finally, the report will identify the key job profiles and workforce development initiatives required to realize these upgrading trajectories.

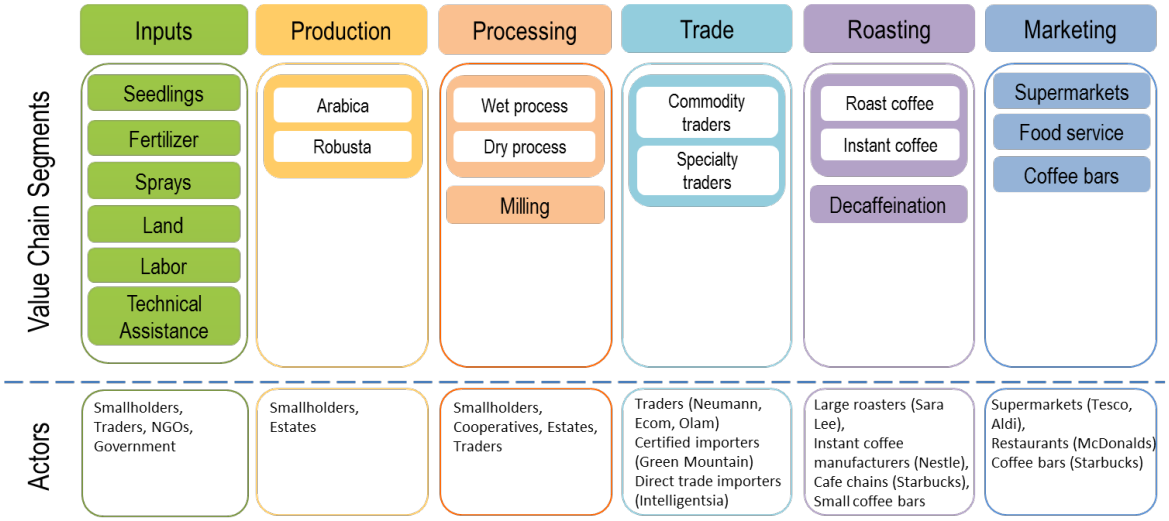
II. The Coffee Global Value Chain

Coffee is an economically strategic commodity for many equatorial LDCs. Production and processing activities employ nearly 26 million workers across all coffee exporting countries, combined (ICC, 2010).[1] Coffee is also among the most widely traded commodities in the world economy, representing US$16.5 billion in gross annual trade (ITC, 2011). The coffee GVC includes several stages of transformation from inputs to final marketing, which typically take place in diverse locations around the world. Figure 1 provides a visual representation of the various stages of value-addition in the coffee GVC, and it highlights the firm-level actors typically associated with each activity. Due to the inadequacy of global input-output data for the coffee industry, it is difficult to get precise figures on shares of value-added contributed at each stage of production. However, estimates indicate that the share of value captured by primary producers has declined over time, while the share of global buyers has increased. In the 1970s, it was estimated that primary producers captured 20% of the total value of the final product, while buyers retained about 50%. Recent evidence suggests that primary producers now capture only between 5 and 10% of the final retail value and buyers capture 75% (FAO, 2013).

Inputs: The production process for coffee requires several inputs, including physical inputs (seedlings, fertilizers and sprays), land and labor. The qualities of the various inputs can determine the types of end-markets in which the coffee may ultimately be sold. For example, for coffee production to be certified as organic, growers may only use particular types of approved organic fertilizers and sprays (TCC, 2012). These inputs are typically sourced directly by smallholders or estates; however traders, non-governmental organizations (NGOs) and government actors may provide assistance to finance the purchase of inputs. Frequently, technical assistance in the form of workforce development and agronomy services are also required for growers to increase their productivity and the value of their products (Murray et al., 2006).

[1] Comparable figures are not available for non-producing countries (ICC, 2010).

Figure 1: The Coffee GVC



Source: CGGC; Ponte, 2002; Fitter and Kaplinsky, 2001; Daviron and Ponte, 2005, Fernandez-Stark and Bamber, 2012.

Production: During the production stage, coffee trees are cultivated on large estates or on small farms and it takes approximately 3-4 years to for a tree to become productive. Nearly 70% of the global coffee supply is produced on small coffee farms of 1-5 hectares, usually using family labor, although occasionally additional labor is hired during harvesting periods (TCC, 2012). There are two species of coffee grown for consumption: Arabica and Robusta. *Arabica* beans are typically considered to impart a superior taste compared to Robusta beans and therefore fetch a higher market price relative to Robusta (ITC, 2011; Ponte, 2002a).[2] Nearly all specialty coffee is Arabica. Arabica coffee trees thrive only in particular geographic conditions, such as an altitude of 1,000-2,000 meters and average temperatures between 15° and 24°C (ICO, 2013a). *Robusta* coffee trees yield roughly 33% more beans per hectare compared to Arabica; however this type of coffee is far less flavorful, so it is more commonly destined for lower-value segments of the market such as instant coffee (ICO, 2013a). Since Burundi's climate and geography are suited to the production of Arabica – but not Robusta – coffee, this report focuses on Arabica only.

Processing: During this stage, the coffee cherry is cured and milled to remove the fruit from the bean. Curing occurs either through dry or wet processing. Dry processing involves exposing the coffee cherries to the sun to dry for one month, at which point the fruit becomes brittle and can be easily removed from the bean. Under wet processing, the cherry is immersed in water in order to soften the outer layer, and the fruit is removed. Wet processing is typically seen to impart a better flavor to the coffee, which often translates into a higher price. After curing (dry or wet), the bean must then be milled and washed in order to remove any remaining layers of skin or husk, and the resulting product is *green coffee*. Actors involved in processing can vary (ITC, 2011). In some cases, smallholders process the cherries themselves, especially with dry processing. Small farmers frequently participate in cooperatives or associations to achieve efficiency gains at the processing stage. Large estates usually process their beans on-site. In some cases, trading companies are integrated into the processing stage to ensure a steady supply of coffee with desired characteristics (Akiyama, 2001; Ponte, 2002a). Green coffee can be stored for over 10 years in an adequately controlled environment before being roasted, and therefore, is best suited for intercontinental shipping (Daviron & Ponte, 2005; Field Research, 2013; Ribeiro et al., 2011).

[2] In unusual market conditions high-quality Robusta beans may be more highly valued than low-quality Arabica by international trading companies (Nicholson, 2013a).

Trade: More than 80% of green coffee beans are traded internationally, and trading companies play an important role in coffee GVCs (TCC, 2012). Traders purchase green coffee from growers and grower associations and ship the beans to the end-market. Large roasters rarely source beans directly from producers. This segment is highly concentrated with the six largest coffee traders controlling roughly half of the volume of coffee traded internationally (ITC, 2011; Ponte, 2002a). The official coffee price is based on the New York Stock Exchange (NYSE) and is influenced by numerous other factors (Section III), thus the price fluctuates on a daily basis.

As consumer preferences in mature end-markets grow more discerning, two major niche markets have grown considerably. Each of these niche markets involves a more intensive role for traders to ensure certain production requirements are met, and they also command higher prices than the NYSE price for regular coffee. The first expanding niche is for specialty coffees, which are of exceptional quality. The supply chain for specialty coffee involves complex, relational linkages between roasters, traders, processors and growers (see Box 1). Certified coffee is the second largest niche, which involves a more complex compliance regime that aims to increase environmental or fair trade standards in the GVC. However, although traders frequently play a role in assisting producers to meet certification requirements (TCC 2012), the additional costs imposed on producers and processors can mean that pursuing certifications is not always cost-effective for producers and processors.

Roasting: Roasters produce roast coffee beans and instant coffee. The roast coffee market segment includes both blended and origin-specific beans from different traders. Arabica beans are more commonly found in the whole bean and ground segment, while Robusta beans are typically used for instant coffee.[3] If the coffee is to be decaffeinated, this process takes place just before roasting and is accomplished by passing the green coffee through a steam bath or submersing it in a prepared water solution. Roasted coffee loses quality within a matter of weeks, even with high-quality packaging, so roasting activities are typically concentrated within the major end-markets of Europe, North America and, increasingly, East Asia. The high perishability of roasted coffee makes it unsuitable for shipping long distances or where logistics and customs processes lack predictability and can cause unforeseen delays.

The roasting segment of the coffee GVC is highly concentrated, particularly the instant coffee segment, where the two largest players, Kraft and Nestlé, control more than 70% of the market (ITC, 2011; TCC, 2012). In many cases, these actors will also control the marketing of their product, selling roast coffee through in-house retail operations or exclusive distribution arrangements with supermarkets.

Marketing: The three main channels through which coffee is marketed are retail, the food service industry, and specialty coffee bars. The retail channel makes up 70-80% of coffee consumption, and the main players are supermarket chains such as Tesco, Walmart and Aldi. Retail outlets sell commodity, specialty and certified coffee sourced from large specialty roasters as well as from smaller local and regional niche roasters. In recent years, supermarket chains have also begun roasting and marketing their own brands of coffee. Specialty coffee bars gained prominence in the US, Europe and East Asia in the 2000s (Daviron & Ponte, 2005). These specialty coffee bars – Starbucks being the most well-known – sell both prepared coffee and roasted coffee beans, which are roasted in-house or by relatively small-scale niche roasters. Specialty coffee bars compete on the basis of quality, through prominently displayed certifications and the weaving of "compelling stories" about the conditions under which the coffee was produced (Golding & Peattie, 2005; Ponte, 2002a).

[3] Instant coffee is prepared by making liquid coffee and then either spray-drying or freeze-drying it to produce granules, which the consumer rehydrates.

Box 1: What is Specialty Coffee?

Specialty coffee is that which exhibits the highest levels of quality. These coffees usually command higher market prices due to the superiority of the beans. Most specialty coffee is of the Arabica variety, which is best grown at altitudes between 1,500m and 2,200m above sea level (SCAA, 2012). Achieving 'specialty' status involves minimizing defects and impurities in the production processes. This requires acute attention by farmers from beginning to end: sourcing premium seeds, preparing soils carefully, precisely maintaining the crop, and ensuring that cherries are picked at peak ripeness. Highly skilled buyers or testers – also known as cuppers –assess the coffee to determine 'specialty' status. These cuppers have trained palates to evaluate the purity of different coffees, similar to that of a sommelier, and they are certified by organizations such as Specialty Coffee Association of America (SCAA), Specialty Coffee Association of Europe (SCAE) and Coffee Quality Institute (CQI). Without a cupper's approval, coffees are generally not considered 'specialty'. Due to this rigorous assessment, effective coordination between key chain actors is essential to access specialty coffee markets.

Cuppers rate the quality along two key dimensions: grading the green coffee beans and coffee sampling. When grading green coffee beans, cuppers assess a sample of beans for defects, color, and odor. Specialty beans do not exhibit any major defects and have no more than five minor defects. They also lack obvious blemishes; are blue-green, bluish-green and/or green in color; and must not contain any foreign odors (SCAA, 2009b). For sampling, the coffee is tested 15 times in a uniform three step process: step 1—fragrance/aroma; step 2—flavor, aftertaste, acidity, body, and balance; and step 3: sweetness, uniformity and cleanliness. The coffee is scored from 0-100. A score of at least 80 is required across all 15 tests to be graded as 'specialty' (SCAA, 2009a). Higher scores equate to higher quality and therefore generate higher market values.

It is important to distinguish 'specialty coffee,' which is defined on the basis of quality, from 'certified coffee,' which is defined on the basis of process certifications (i.e. organic or shade-grown farming practices). While both 'specialty' and 'certified' designations allow producers to gain access to higher-value market niches, there are pros and cons to each approach. Certification is often more costly, but certifying agencies may offer technical assistance. Specialty coffee does not require costly certifications; however, it does require a certain level of human capital so that growers can produce high-quality beans and effectively access specialty markets.

Estimates of the size of the specialty market in the US range from 5% of the total market for green coffee to 38%, depending on the definition of "specialty" (see ITC, 2011, p. 38-43). Applying the SCAA's standards, the ITC estimates that only 5% or perhaps 8% of the coffee consumed (by volume) in the US is of specialty grade. However, the SCAA reports that 37% of the coffee consumed in the US is specialty (SCAA 2012). This higher figure likely includes slightly lower-quality "premium" coffees (which face less exacting standards) as well as certified and flavored coffees.

III. The Geography of Demand and Supply in Coffee GVCs

This section of the report examines how demand and supply are changing in the coffee GVC, using export and production data, in order to situate Burundi's position in the overall context of industrial change. In 2011, total world imports of green coffee reached $16.5 billion (ITC, 2013; see Table 13 in the Appendix for per-country totals).[4] Although coffee consumption typically increases by an average rate of only 2.5% per annum, the value of the world imports of green coffee had nearly doubled since 2009, when world imports were $14.44 billion, due to rapid increases in commodity prices (ICO, 2013d; ITC, 2011). Decaffeinated coffee purchases make up less than 10% of total demand in most consuming markets (ITC, 2011).

[4] This figure likely includes double-counting for exports due to the significant role played by Germany and Belgium as re-exporters.

Green coffee trade represents most (74.6%) trade in all coffee products in 2011 (see Table 13 and Table 14), because green coffee better preserves quality than roasted coffee. In 2011, the top ten importers of green coffee were in North America, Europe and East Asia. The three largest markets alone (US, Germany and Japan) account for nearly one half of all imports of green coffee. Belgium and Germany are major re-exporters of green coffee, importing beans from abroad for distribution within the European market. The world's largest coffee trader, the Neumann Gruppe, is in Germany. Belgium's role in re-exporting has grown rapidly due to infrastructure improvements in the port of Antwerp (CBI, 2011). Imports of instant and roasted coffee in 2011 totaled $9.04 billion, and the major importing countries were the United States, France, Germany, Canada and the Netherlands (see Table 14).

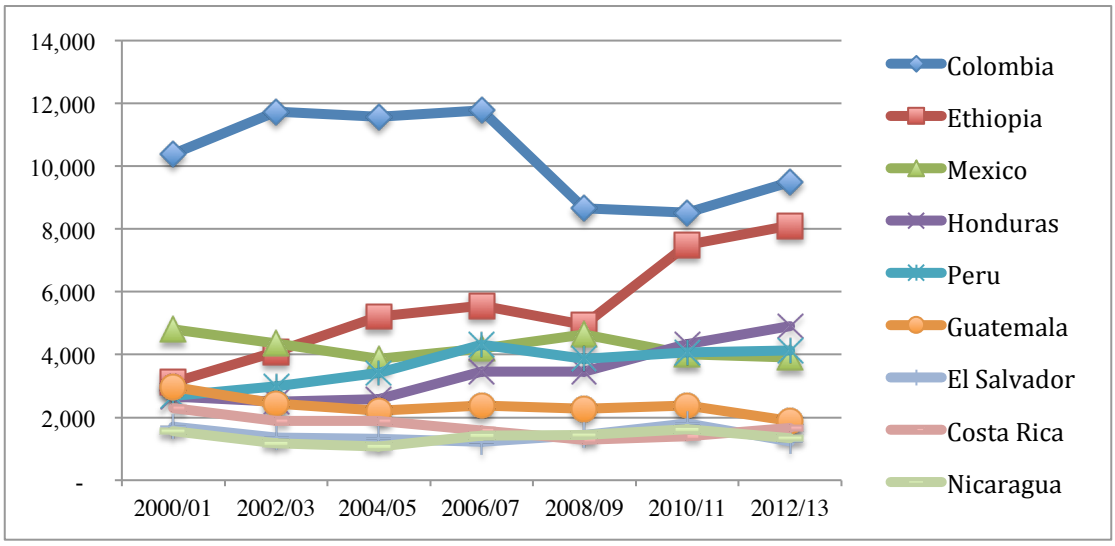
Countries that are strong exporters of roasted coffee rely on trade policies that create incentives for domestic roasters. For example, Germany, Switzerland, Italy, and other European exporters of roasted coffee have provided a boost to their roasting industries by eliminating tariffs on imports of green coffee beans and placing tariffs, typically at 9%, on imports of roasted, instant and, in some cases, decaffeinated coffee. The US has import tariffs on instant coffee, but not on green, roasted, or decaffeinated coffees (ICO, 2013b). Switzerland has dramatically increased its exports of roasted and instant coffees as a result of growing demand among consuming countries for single-serve instant coffee (ITC, 2011). Nestlé has maintained leadership in this segment through success of its Nespresso brand – produced at Nestlé headquarters in Switzerland (Nestle, 2013).

As market growth trails off in mature end-markets, emerging markets such as China and India are increasingly driving global demand for coffee. In China, the demand for instant coffee reached 40,000 metric tons in 2012 which is a 43% increase from their consumption in 2008 (Nicholson, 2013b). Growth in the specialty market segment is also very strong in China, with Starbucks set to double the number of its outlets in China (currently at 700) by 2015 (Burkitt, 2012). Eastern European countries, including Ukraine and Romania, are also among the most promising emerging end-markets for high-quality coffee (Euromonitor 2013).

With respect to producing countries, Brazil is by far the largest producer of coffee in the world, with production of Arabica coffee reaching 24.0 million 60kg bags during the 2011/2012 growing season (ICO, 2013d).[5] Changes in Brazil's production trigger major shifts in the global price for coffee. Vietnam is the second largest producer, although, while it plans to expand production of Arabica coffee, its current crop is almost entirely composed of commodity-grade Robusta coffee. Vietnam was a very minor player in the world coffee market until 1994, when the government introduced incentives for Robusta production and its exports expanded dramatically thereafter (Baffes & Onal, 2012; Daviron & Ponte, 2005). In fact, world markets were unprepared for the surge of (primarily low-quality) Robusta beans from Vietnam, which partly contributed to the coffee crisis of 2001 (ITC, 2011; Ponte, 2002a). Colombia is the biggest producer of *exclusively* Arabica beans, with total production of 7.7 million bags in 2011/2012 (ICO, 2013d). Total production of Arabica beans from the five East African Community (EAC) countries during the same period was significantly lower, at 2.48 million bags (ICO, 2013d), indicating that these countries command a very small share of world markets and have little influence on price. Figure 2 details production volumes for the leading Arabica producers.

[5] Total production in Brazil during 2011/2012, including 4.6 million bags of Robusta coffee, was 28.6.

Figure 2. Leading Producers of Arabica Coffee excl. Brazil, 2000-2012 ('000 60kg Bags)



Notes: Brazil and Guatemala produce both Arabica and Robusta coffee. Brazil is the leading producer of both Arabica and Robusta coffee, Arabica accounts for approximately 75%; an estimated 60% of production in Guatemala is Arabica.

Source: (ABIC, 2013; CIC, 2011; ICO, 2013d; ITC, 2011)

In the leading countries, large-scale production models dominate the coffee sector, with large estates generating high volumes of commodity coffee. The share of specialty coffee in these countries' exports is, as in most countries, relatively low. To compete with the large-scale producing countries, other countries have successfully pursued niche markets, including Costa Rica and Ethiopia. These countries have built a completely different production model, based on the cultivation of high-quality specialty and/or certified coffee by smallholder farmers. In Costa Rica, for example, 80% of coffee production is for the specialty market. It has been so successful at this that it is now the fourth largest specialty coffee producer in the world, as indicated in Table 1 (USAID, 2010d). This quality-oriented upgrading model is one that may be well-suited to Burundi due to the dominance of small-scale production in the country, its proximity to European markets and its climate, which is ideally suited to the cultivation of high-quality Arabica coffee.

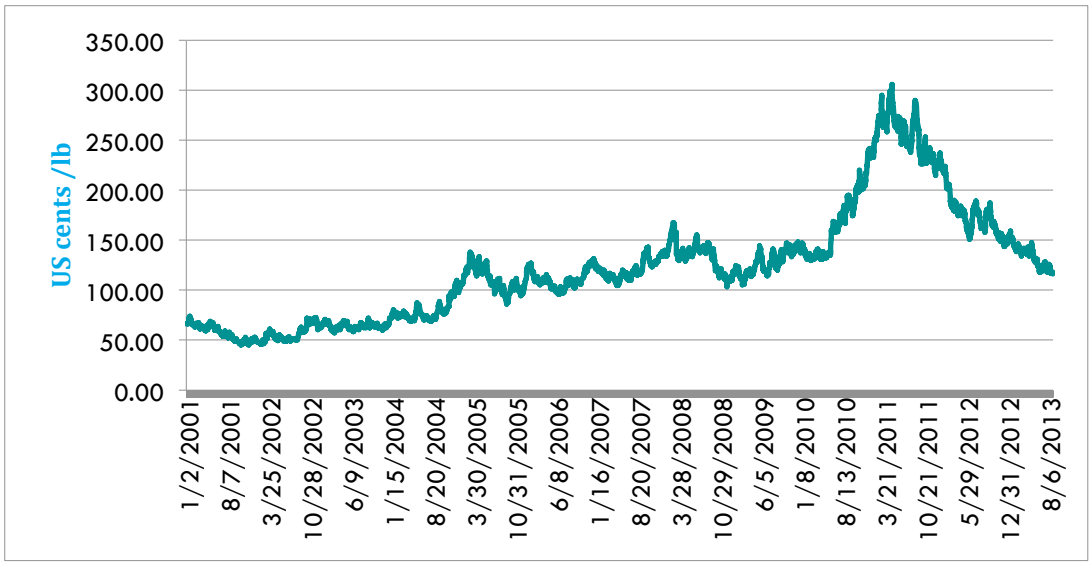
Table 1. Specialty Coffee Production Volume, by Country 2008

	Country	Volume (60 kg bags)	% World Specialty Production
1	Colombia	3,450,000	34.34%
2	Guatemala	2,000,000	19.91%
3	Brazil	1,000,000	9.95%
4	Costa Rica	850,000	8.46%
5	Nicaragua	400,000	3.98%
6	Ethiopia	400,000	3.98%
7	Kenya	350,000	3.48%
8	Mexico	300,000	2.99%
9	El Salvador	300,000	2.99%
10	Peru	250,000	2.49%

Source: Authors, based on information from USAID, 2010e.

Factors related to supply and demand affect the coffee price paid to producers, which has been subject to considerable fluctuation over the past fifteen years (Figure 3). For example, significant events in large-scale coffee producing countries such as a drought in Brazil or Colombia have had considerable impacts on the price. Coffee sold via futures markets is almost entirely destined for commodity segments of end-markets (e.g. instant, and non-specialty, roasted and ground coffee).

Figure 3. The New York Stock Exchange Coffee Price for Arabica Beans, 2001-2013

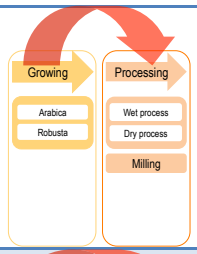
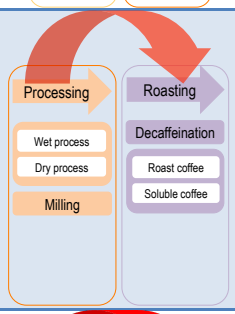
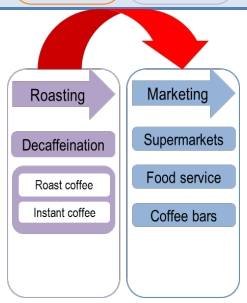
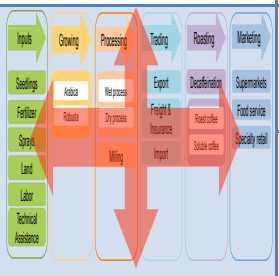
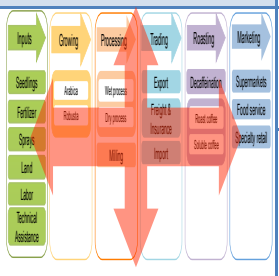
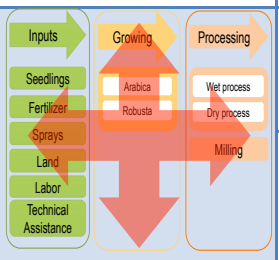


Source: (ICE, 2013).

IV. Upgrading and Governance in the Coffee GVC: Lead Firms and Standards

In the GVC literature, shifting to higher value activities in global production operations is referred to as economic upgrading (Gereffi et al., 2005). With the increasing popularity of value chain theory, policy makers in many developing countries have actively pursued upgrading opportunities in an attempt to capture a higher share of economic gains from GVC participation. Functional upgrading, that is, incorporating additional functional activities of the chain (e.g. moving into branding activities), is a highly sought after trajectory. However, these are often difficult upgrading trajectories for developing countries to pursue because there tend to be higher barriers to entry in the higher-value stages of GVCs due to higher skill and capital requirements and highly-concentrated markets. In developing countries, product and process upgrading can be more attainable, since they may require relatively minor investments in skills, equipment, or adjustments to the production process. Table 2 summarizes the key upgrading trajectories in the coffee GVC.

Table 2. Selected Upgrading Strategies in the Coffee Global Value Chain

		Description
PROCESSING (FUNCTIONAL UPGRADING)		• Processing, including wet and/or dry processes and milling must be completed shortly after picking, so this activity must be located near production operations. The quality of these processes influences the price that buyers will pay for coffee. *Example*. In 1972, a partially funded World Bank project in Ethiopia upgraded sun drying with washing stations (Common Fund for Commodities et al., 2000). Today, washed Ethiopian coffee is amongst the finest in the world (Coffee Review).
ROASTING (FUNCTIONAL UPGRADING)		• Most roasting is done in or near the end-market, due to rapid quality decline, although improved packaging technologies can increase shelf life. Requires capital and knowledge investments. • Roasting potentials are limited in many producing countries due to low demand. Example. Costa Rican firms began roasting coffee in the 1980s, to target local and tourist markets. Today, there are over 27 SME roasters in the country. One of the most successful, Café Britt, built its export business on direct orders to US customers, and through airport retailing in Latin America.
MARKETING (FUNCTIONAL UPGRADING)		• Marketing creates brand identity, according to quality and taste characteristics. Effective marketing initiatives rely on distinguishability of coffees from particular origins, thus traceability measures must be implemented to ensure value capture. Example. In the early 2000s, Rwanda initiated programs to increase coffee earnings and reposition it as a specialty producer. These included improving production and processing quality, but also driving marketing initiatives. In 2012, 27% of Rwanda's coffee is exported as specialty coffee, up from 0% in 2000 (Alliance for Coffee Excellence, 2008; Kalan, 2012; National Agricultural Export Development Board, 2013).
PRODUCT UPGRADING		• Product upgrading involves the production of a higher value product. • Requires knowledge of market preferences, costs and prices. • Entering certified and specialty niche markets are examples of product upgrading but usually requires process upgrading first. Example. Recent government initiatives in Vietnam have focused on doubling the land under cultivation of Arabica coffee by 2015 in order to improve farmers' revenues also encouraging farmers to sustainably replace aging Robusta trees with more profitable Arabica trees (New Agriculturist; Vietnam Business and Financial News, 2009).
PROCESS UPGRADING		• Introduction of new technologies into the production system or restructuring the existing system to improve efficiency. • Examples include: shade-grown coffee, use of organic production techniques or improved harvesting techniques, amongst others. Example. In 2003, the Guatemalan Coffee Growers Association launched a traceability project with SGS using a Geographic Information System (GIS) database to identify the precise characteristics and location of all coffee grown in the Antigua region. By 2012, all producers in the region were registered in the database (Antigua Coffee APCA Guatemala).
ENVIRONMENTAL UPGRADING		• This involves adoption of safer or less harmful practices to toxic fertilizers and sprays, the clearing of land for non-shade grown coffee, and water pollution associated with wet processing. • Often a pre-condition to export certification. Example. Water pollution was a key factor affecting Central American coffee growing areas in the early 2000s. During the 2000s, initiatives from USAID, IDB and other development agencies played a strategic role in decreasing water pollution from wet-processing operations. Key aspects of these projects included the installation of eco-pulping machines and awareness training on where and how water was disposed of after use.

SSource: Duke CGGC.

A. Governance

A key aspect for developing policies to support upgrading in GVCs is to understand the relationships between actors in the chain and how that determines how financial, material and human resources are distributed (Gereffi & Fernandez-Stark, 2011; Gereffi & Korzeniewicz, 1994). The relative power and influence of different actors can enhance or inhibit a country or actor's potential to successfully upgrade (Gereffi & Lee, 2012). In coffee GVCs, it is useful to differentiate between different segments of the market, because specialty and certified niches are now quite large and, yet, also have very different governance structures than commodity coffee.

In the regular coffee market, the lead firms are the roasters. The top four firms are Kraft, Nestlé, Sara Lee and Smuckers, accounting for 40% of the roasted ground market, and Kraft and Nestle together accounting for more than 70% of the instant coffee market (see Table 17 in the Appendix). These firms have considerable market power over upstream and downstream actors due to high levels of market concentration, the use of lean supply chain techniques, and control over product branding (Ponte, 2002; Daviron and Ponte, 2005).[6] Major roasters in this market segment usually do not accept Arabica coffee for their blends from countries that cannot guarantee a minimum of approximately 60,000 tons per a year (Ponte, 2002b; Raikes & Gibbon, 2000), which means that this market segment tends to exclude small-scale producing countries with unpredictable supply. Given that Burundi's coffee sector is dominated by smallholders and supplies a relatively small share of world exports, the regular coffee market is not a great fit for Burundi because of the challenge producers have accessing these markets and being competitive.

Traditionally, trading companies have played an important gatekeeping role in controlling market access in the regular (non-specialty) coffee market segment. They typically source, track and manage vast supplies of green coffee for roasters around the world (Fitter and Kaplinsky, 2001; TCC, 2012). Market power is concentrated in this segment as well, with the top ten traders controlling 60% of global trade in coffee (see Table 17Table 17 in the Appendix). Over the last 20 years, however, roasters such as Nestle have adopted stricter supplier-managed inventory (SMI) practices, and are increasingly forming direct relationships with coffee producers. (Ponte, 2002b). As a result, the balance of power in the coffee GVC has begun to shift from traders to roasters.

These changing governance dynamics have increased opportunities for developing country producers to engage directly with roasters in the regular coffee segment and to benefit from increased interactions with buyers regarding issues of quality production and price. Over time, these interactions can potentially drive upgrading (Gereffi et al., 2005). However, small coffee producers have very little bargaining power in regular coffee GVCs due to limited economies of scale, undeveloped commercial skills, and poor access to information about conditions in end-markets. Furthermore, they often lack the capital required to transport the product to port, relying on traders and roasters to provide financing and transportation. As a result, small producers often receive a very low share of the final value of the coffee produced. For example, as shown in Figure 4, in 2008, producers of Washed Arabica Coffee received approximately 5% of the final US$20 per lb retail price.

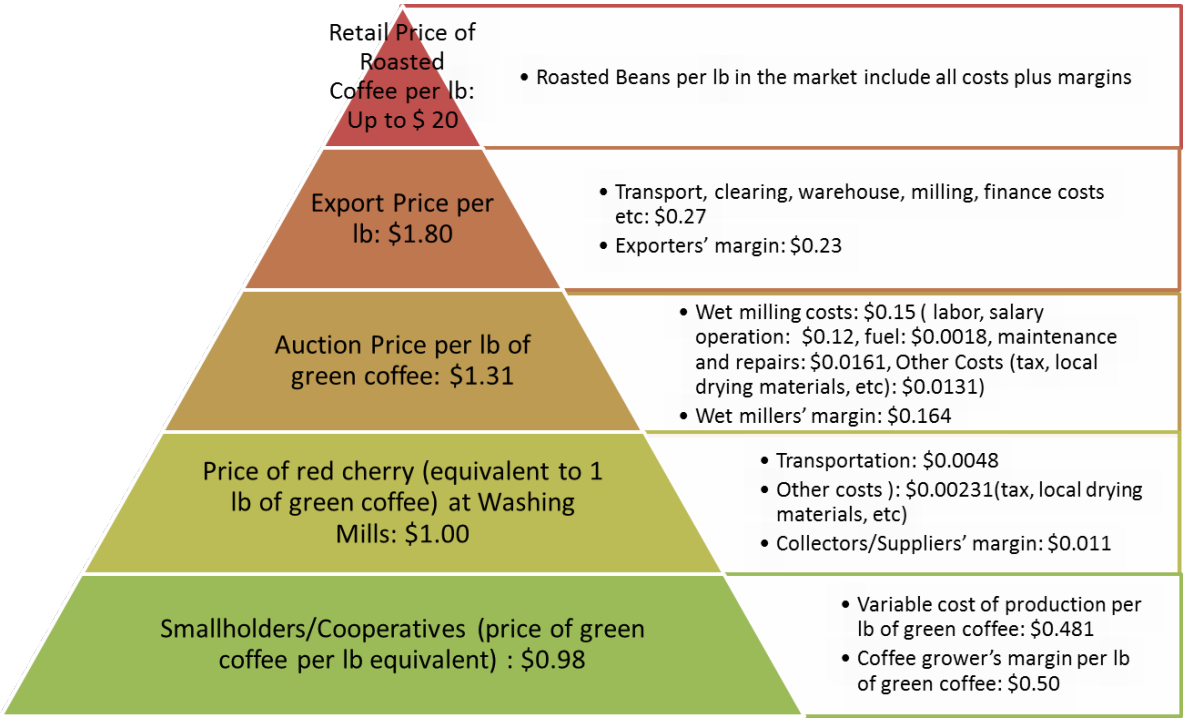
In the specialty coffee market, the roasters tend to engage more directly with producers in the value chain than those in the regular coffee market, due to the need to maintain quality. In the early 2000s, large specialty coffee roasters like Starbucks, as well as smaller ones such as Counter Culture, Intelligentsia and Stumptown, began sourcing directly from producers through a model known as "direct trade." Some traders have responded by vertically integrating down the value chain into domestic green coffee production and processing operations in certain coffee

[6] *Lead firms* are those firms that are able to influence the terms by which other actors participate in the value chain.

producing countries with less developed supply chains (Ponte, 2002b). The extent to which the benefits of direct trade arrangements accrue to producers depends not on the rules of a third-party certifying body, but rather on the commitment of the roaster to ensuring that high premiums are paid to farmers and to maintaining a stable relationship with suppliers. While they face an incentive to offer high prices to farmers, in order to compete over the relatively small world supply of very high-quality coffee, direct trade roasters also face market competition at home, which limits the premiums that they might pass on to producers.

Governance in the certified niche is also more tightly controlled than the regular coffee market, but unlike specialty coffee it often involves third-party certification organizations that certify producers, provide technical assistance, and assess compliance over time (see Box 2: Certification Schemes). In fact, there is a range of governance arrangements. These include first-party corporate schemes, in which a roaster sets up its own special line of certified coffee (Starbucks C.A.F.E., Nestlé AAA); non-profit third-party certification regimes that operate through corporate partnerships (FLO, Rainforest Alliance), and for-profit third-party certification schemes (4C) (Raynolds, 2009; TCC, 2012). Fair trade certified coffee is one of the most well-known forms of certified coffee, in which the certifying agency tries to ensure that producers get a fair price (a response to prices dipping unsustainably low for producers when quotas were phased out). There are now dozens of certifications, including third-party process standards, company-specific supplier certifications and country-specific product standards, covering the global coffee market (see Table 3Table 3). Most require producers or producer organizations to pay to participate in the certification program (Daviron & Ponte, 2005; ITC, 2011; Raynolds, 2009). Whether or not certification ultimately results in a better deal for producers is debatable. Depending on the local context, long-term benefits of improved farmer and value chain coordination and productivity could outweigh marginal costs of certification on a seasonal basis (Barham & Weber, 2012; Méndez et al., 2010; Ruben & Fort, 2012; Valkila & Nygren, 2009).

Figure 4. Distribution of Value for Washed Arabica Coffee by Actor, Ethiopia 2007/8



Source: (Light Years IP, 2011; USAID, 2010b).

The governance patterns in each of the three main segments of the coffee market are very different, which means that the potential for upgrading will vary in each of these segments. The specialty and certification niches of the coffee GVC appear to offer more opportunities for smallholders to participate on competitive terms in the coffee GVC than the regular coffee market because of the tendency in the regular coffee market to emphasize mass production and efficiency over quality or standards. Nevertheless, both specialty and certified coffee have higher barriers to entry due to the additional skills and capital required to enter these segments. Therefore, upgrading into these segments of the coffee market is likely to be more effective with strategic policy initiatives that enhance human capital, provide technical assistance and increase access to credit among small producers.

Box 2: Certification Schemes

Starting in the mid-2000s, there have been growing concerns about the social, environmental and economic sustainability of conditions in coffee producing countries, especially in the wake of the coffee crisis of 2001. As a result, various certification schemes have been established that set minimum standards for prices paid to producers and coffee growers' practices, such as certified organic, shade grown or fair trade coffee. Certified coffee has attracted a growing share of the global coffee market. As of 2010, 9% of all coffee products sold to consumers were certified. The coffee bars associated with specialized coffees have been important promoters of certification initiatives (Ponte, 2002a). Demand has increased so much that even the major roasters in the regular coffee market have begun to purchase more certified coffees in recent years (Muradian, 2005; TCC, 2012). However, there is an oversupply of certified coffee, which means that only a portion of a certified crop may be sold in the certified market, and the remaining coffee has to be sold as regular coffee (ITC, 2011). The seven most widely adopted certification schemes are presented in Table 3.

Table 3. Select Private and Civil Society Standards in the Coffee GVC

Certification	Participating Lead Firms	Major end-markets	Description
Fairtrade Labeling Organization (FLO)	Tchibo, Starbucks	UK, Netherlands, USA*	• Certification for small growers and associations. • Focused on ensuring equitable and stable prices for growers by setting minimum prices that participating producers receive.
International Federation of Organic Agriculture Movements (IFOAM)	Tchibo	Germany, Italy	• Certification program for organic farmers. • Sets standards for pesticide use, conservation practices, biodiversity and social justice.
Rainforest Alliance (RA)	Nestlé, Kraft, Tchibo	Germany, UK, USA	• Sets minimum standards for farming practices among growers. • Based on multi-crop guidelines developed by Sustainable Action Network.
UTZ Certified	Tchibo, Sara Lee	Netherlands	• Code of conduct for roasters and growers. • Sets sustainability standards. • Sets standards for traceable coffee supply chains.

Common Code for the Coffee Community (4C)	Nestlé, Kraft, Tchibo, Strauss, Aldi	Europe	• Code of conduct for roasting industry. • Sets baseline criteria for social, ecological and economic conditions in producing countries. • Formed 2003, standards implemented as of 2007.
Starbucks' Coffee and Farmer Equity Practices (C.A.F.E.)	Starbucks	Worldwide	• Corporate standards for quality and sustainable farm practices. • Focus on areas of Product Quality, Economic Accountability, Social Responsibility, and Environmental Leadership
AAA Sustainable Quality Program	Nestlé	Worldwide	• Corporate guidelines for verifying farm practices. • Focus on environmental sustainability, origin and taste.

Sources: FLO, 2012; ITC, 2011; TCC, 2012.

Note: *The American fair trade organization, Fairtrade USA, split from FLO in 2011.

Producers in developing countries, frequently with the support of development agencies, have focused considerable effort in the past decade on securing these certifications, particularly in Latin America. However, the actual economic and social impact of obtaining these certifications still remains somewhat unclear, and empirical evidence is limited. Generally, both qualitative and quantitative analyses on the impact of the Fairtrade, Organic and Rainforest certifications conclude that these programs lead to improved production management, increased returns, stronger producer organizations and improved access to credit and other inputs (Arnould et al., 2009; Méndez et al., 2010; Nelson & Pound, 2009; Ruben & Fort, 2012). (Nelson & Pound, 2009). Such benefits are also seen to increase over time, paving the way for easier certification in other standards, improved production processes and, ultimately, higher yields (Barham & Weber, 2012; Bolwig et al., 2009). Nonetheless, when increased inputs (time and opportunity costs) are taken into account, changes in net revenue for households as a result of certification appear to be modest, particularly during years in which regular coffee prices are relatively high (Haggar et al., 2012; Nelson & Pound, 2009; Ruben & Fort, 2012; Valkila & Nygren, 2009). Increased price premiums may simply offset increases in input and opportunity costs. Often, the benefits of certification accrue to the lead firms, who are able to realize higher returns from the branding.

V. Burundi in the Coffee Global Value Chain

Burundi has a long history of coffee production and is the 13th largest producer of exclusively Arabica coffee in the world (ICO, 2013). The sector is of strategic importance to Burundi's national economy. It employs over 1 million people, predominantly smallholder producers, with one in every two households engaging in coffee production to generate cash income (USAID, 2013). Coffee exports account for 80% of foreign exchange earnings and have contributed between 4-10% of the country's GDP over the past ten years (UNIDO, 2013; USAID, 2013). Burundi derives its competitive strength in the coffee GVC from ideal biophysical conditions for the production of Arabica coffee (climate, soils, etc.), a legacy of coffee production and the business networks associated with it, and well established washing operations for processing beans (due to previous investments in upgrading this stage of production). The country's coffee is sold primarily as fully washed or washed commercial grade coffee, which accounts for an estimated 90-95% of sales.

Despite these strengths, the coffee sector in Burundi now faces considerable competitive threats. It sells primarily into the coffee commodity market, so it is exposed to the dramatic price fluctuations in that market segment. Moreover, large-scale producing countries such as Brazil and Vietnam are increasing their Arabica production, which they can achieve at lower prices due to

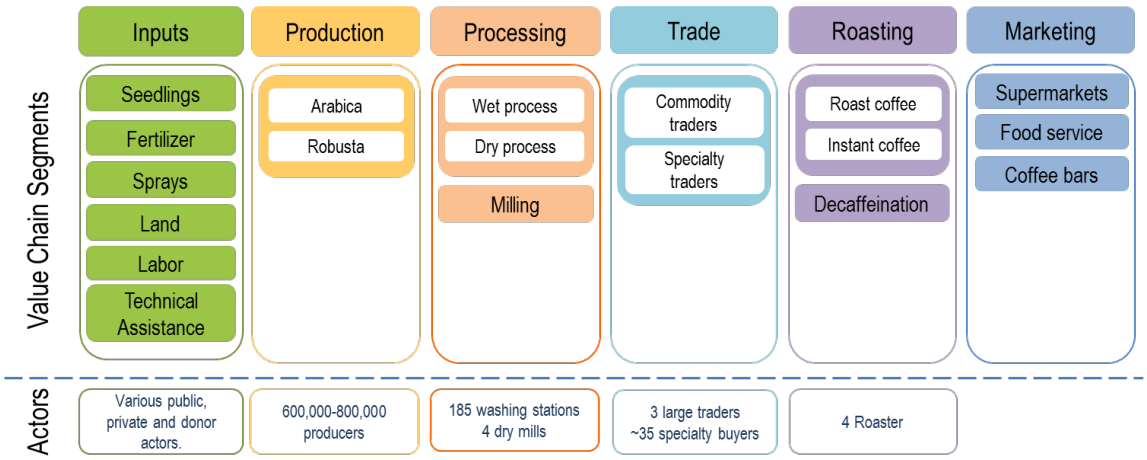
economies of scale. In addition, Burundi's productivity is low and production is falling (UNIDO, 2013; USAID, 2013), and though privatizing and liberalizing reforms have removed inefficient price supports, institutions have not adjusted to provide mechanisms to support the financial wherewithal of producers during volatile periods. As a result, producers are seeing net incomes from coffee decline (Integrity, 2013) and are beginning to opt out of the sector. This presents a challenging situation for the country, and heightens the urgency to find ways to maintain and strengthen Burundi's competitiveness.

This section examines Burundi's position in the coffee GVC to identify the current constraints to and opportunities for upgrading. It starts by analyzing the basic structure of the industry and why production has been falling, drawing some comparisons between Burundi's position and its neighbors in EAC countries. It then explores the role of the state in shaping the dynamics of the Burundian coffee sector and its competitive position with respect to world markets. Finally, it identifies and explains the key constraints that must be overcome in order to increase the value of coffee exports from Burundi.

A. Burundi's Coffee GVC

Burundi's coffee sector is dominated by the smallholder production of Arabica coffee, with an estimated 590,000-800,000 households cultivating coffee, depending on the season. All coffee is either fully washed at one of the 185 washing stations or washed by traditional methods (USAID, 2010), prior to being dry milled into green coffee and shipped, primarily to European markets. Of the roughly 25,000 MT produced annually (see Figure 6), less than 2,000 MT of the crop is roasted locally for domestic consumption. Figure 5 illustrates Burundi's participation in the coffee GVC and highlights the leading actors in different stages of the chain.

Figure 5. Burundi in the Coffee Global Value Chain



Source: Authors.

Coffee production is concentrated in the mountainous regions of the country, between 1,500 and 2,000 meters above sea level (USAID, 2013). On average, households cultivate between 150-250 trees each (Integrity, 2013; UNIDO, 2013; USAID, 2013; World Bank, 2011). Between 1983-2007, Burundi produced an average of 26,700 MT of green coffee annually;[7] since then, however, production has declined to 24,360 MT in 2013 and has been substantially lower than the anticipated capacity of 50-60,000 MT (World Bank, 2011).

[7] This is the same as the level of production in the 1950s and 1960s (World Bank, 2011).

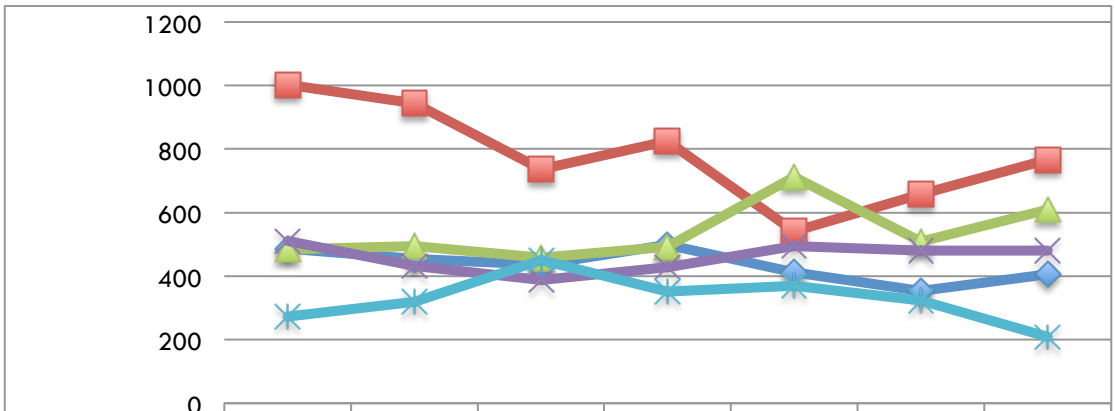
Actors in the coffee sector attribute declining production and low productivity to a range of factors, including poor returns, which declined by 28% between 2011 and 2012 (Integrity, 2013); aging trees; insufficient water (due to climate change and poor water management); poor maintenance of plantations due to lack of motivation, high opportunity costs, and insufficient knowledge regarding good agricultural practices (GAP); and, poor use of fertilizer due to cost and limited access (Field Research, 2013; UNIDO, 2013; USAID, 2013). Research suggests that the inadequate use of mulching may be contributing to productivity declines more than low fertilizer usage, because high soil acidity and soil degradation are causing fertilizers to leech through the soil and contaminate water supplies with little effect on productivity (M. Kaboneka, 2013; USAID, 2013).

Producers can be divided into three main groups: individual producers that sell to the closest CWS with little access to technical assistance or other inputs; producers that have been organized or self-organized into cooperatives, accounting for 30% of all producers (UNIDO, 2013); and producers who have been organized into farmers groups by washing station owners to reduce transaction costs in the provision of extension services (Field Research, 2013). A variety of supporting actors, including ISABU, Intercafe and CNAC provide seedlings,[8] fertilizers and technical assistance to these different producer groups.

Overall, Burundi's production model is similar to its neighbors in the EAC. Within the region, Kenya and Tanzania lead the production of Arabica coffee, followed by Uganda, which producers slightly more Arabica than Burundi but is predominantly focused on Robusta coffee. Rwanda, Tanzania and Uganda all rely on smallholder producers with less than 2.5 ha under production. The number of coffee producers in each of these countries, respectively, is estimated to be 500,000, 450,000 and 500,000 (Boudreaux, 2011; Uganda Coffee, 2013; USAID, 2010f). In Uganda, estate operations similar to those in Kenya are beginning to emerge (Uganda Coffee, 2013). Like Burundi, these countries also currently face challenges with respect to outdated production techniques, which have undermined productivity. Like Burundi, Rwanda has seen a decline in overall production since 2004 (GIZ, 2013; TechnoServe, 2011). However, total production figures for Kenya, Tanzania and Uganda have actually risen slightly or at least remained stable in recent years. More research is needed to ascertain why.

[8] In 2010/11, 5,766,000 seedlings were distributed by CNAC to members (CNAC, 2012).

Figure 6. Evolution of Arabica Coffee Production in the EAC, 2000 - 2012 ('000 60-kg bags)



	2000/01	2002/03	2004/05	2006/07	2008/09	2010/11	2012/13
Burundi	487	454	437	499	412	353	406
Kenya	1,002	945	736	826	541	658	767
Tanzania	485	494	458	493	712	508	610
Uganda	510	433	388	429	494	480	480
Rwanda	273	320	450	351	369	323	209

Note: Tanzania and Uganda are also large Robusta coffee producers in their lower laying regions of the country.
Source: ICO, 2013.

Wet processing is one of Burundi's main competitive assets, which positions the country for upgrading because wet processing produces a higher quality bean than dry. It was introduced to Burundi in the 1980s and 1990s through several World Bank-funded initiatives, which installed 133 washing stations in the main coffee producing areas of the country and trained workers to operate them (See Box 3) (USAID, 2013; World Bank, 1983, 1992a, 1992b, 1997). Processing stations further expanded to 150 by 2007 and 185 in 2013.[9] These stations range in size (USAID, 2013). The number of producers delivering to different CWSs also varies from approximately 350 to 3,700 per washing station (Cafe du Burundi, 2013a; Field Research, 2013; USAID, 2013).

Box 3: World Bank initiatives in the Burundi coffee sector, 1970s-1990s

Project Completion Reports from the World Bank from 1983, 1992, and 1997 indicate that coffee improvement efforts have been ongoing in Burundi since at least the late 1970s (World Bank, 1983, 1992a, 1992b, 1997). The training and extension activities conducted are summarized below.

Cultivation
The technical assistance programs focused on improving husbandry methods and input use, with the goal of increasing the quantity and quality of coffee exports. They introduced farmers to new insecticides, distributed more seedlings to replace old trees, taught farmers soil management strategies such as mulching and fertilizer application, and worked on improving pruning practices. Coffee outputs rose slightly after each of these projects, although yields were generally declining due to continued problems with aging plants, insufficient use of fertilizers and mulching, faulty pruning, and planting on marginal land.

Processing
The most significant component of the coffee improvement projects in Burundi was to invest in the construction of water stations for washing coffee beans, and to train people to manage and maintain

[9] These CWSs are stationed in most of the provinces such as 16 in Bubanza, 4 in Bujumbura Rural, 7 in Bururi, 5 in Cibitoke, 19 in Gitega, 14 in Karuzi, 34 in Kayanza, 13 in Kirundo, 5 in Makamba, 6 in Muramvya, 15 in Muyinga, 3 in Mwaro, 43 in Ngozi and 1 in Rutana (Cafe du Burundi, 2013a).

them efficiently. The goal was to increase the value of Burundi coffee exports. The number of washing stations expanded over the years that these projects were in place, which ultimately increased the share of washed coffee in Burundi's exports from 35.5% to over 65% (World Bank, 1997). When the security situation worsened in 1993 and the coffee prices crashed due to the abandonment of the international quota system, these projects were halted.

In 2007, 66% of coffee produced in Burundi was wet processed. Since then, several new techniques have been incorporated, which are summarized in Table 4. The use of these techniques improves the overall quality of production. Improving traceability is also important for selling specialty coffee, obtaining certifications and increasing the ability with which sanitary and phyto-sanitary (SPS) operations can identify the outbreak of diseases (Makangira, 2013). Several environmental management technologies are being employed, including eco-friendly de-pulping, the use of spring or well water and the incorporation of water waste technologies; all have significant room for further improvement. However, the success of these initiatives suggests that Burundi is prepared to begin increasing participation in the specialty coffee market and that there is potential to use similar capacity-building models in other parts of the chain.

Several washing stations are still state-owned (77/185), although most CWSs are run by foreign or domestic private companies (95), the cooperative COCOA (*Union de Coopératives des Caféiculteurs*) (13), or a public-private partnership, known as a SOGESTAL (Cafe du Burundi, 2013a; Field Research, 2013; UNIDO, 2013); the remaining 77 state-owned CWSs will likely be sold during a third round of privatization which is expected to proceed soon. Many washing stations have been operating under capacity since 2007, so an assessment of demand for them is advised prior to the final implementation of privatization. Ownership by private domestic investors also appears to be evolving, because there are knowledge and experiential gaps to overcome (Baranyizigiye, 2013; Demeester, 2013). The actors controlling CWSs are critical in the coffee value chain because they finance a considerable portion of upstream production activities, including inputs (such as seedlings) and technical assistance (UNIDO, 2013), and they provide key downstream linkages with buyers. Because fermentation during wet processing significantly affects the final quality of coffee, it is necessary for CWS owners to continually renew the knowledge and skill level of employees operating these mills.

Table 4. Adoption of Improved Coffee Processing Technologies in Burundi 2007-2012

	Percentage of CWSs Adopting Improved Technologies	
Improved Technology	**2007**	**2012**
Pre-selection of Cherry	**0.0%**	**100%**
Flotation of Cherry	7.9%	91.5%
Day Lot Traceability	0.0%	83.7%
Eco-friendly Depulping Equipment	**0.0%**	**7.8%**
Pre-Drying Parchment	0.0%	83.1%
Pre-Drying Shaded Tables	0.0%	13.5%
Pyramidal Drying	0.0%	21.3%
Spring/Well Water Source	20.9%	24.7%
Wastewater Treatment Technology	0.0%	16.9%
N=	141	178

Source: USAID, 2013.

Compared to Rwanda, Burundi has stronger wet processing capabilities. The majority of Rwanda's 110-125 washing stations have been installed since 2006, although they have benefited from more recent training focused on the specialty coffee market, such as cupping and traceability and on the installation and use of appropriate water management systems (Boudreaux, 2011; USAID, 2006). Kenya's washing stations, with an estimated 8.5 million MT annual capacity owned by estates and cooperatives alike, are also well known for their experience and the prevalence of fully washed processes, but as in Burundi, many of the older stations are in need of equipment and process updates to reduce costs and fully maximize on quality (USAID, 2010c). Installation of washing stations in recent years in Tanzania has been largely the result of donor intervention (TechnoServe, 2011), and there are few privately owned or cooperatively owned operations (USAID, 2010f).

Dry Milling operations: Dry mills in Burundi are equipped to dry and sort the beans by size and density (Cafe du Burundi, 2013b). These technologies are then complemented by hand grading. In 2007, there were 2 private mills and 2 public mills operating in the country (USAID, 2013). Four new operations have been constructed since 2007, and one of the government operations has been privatized (Field Research, 2013; UNIDO, 2013). Private dry mills offer processing services to outside producers (outside their firm) on a pay-per-use basis (UNIDO, 2013; Wege, 2013). The fee is based on a 2007 decree that all coffee produced in Burundi is owned by producers until export, and that producers are entitled 72% of the NYFOB price (Integrity, 2013). This has been important in allowing cooperatives such as those represented by Cococa to upgrade through the chain and maintain ownership of their coffee until it is shipped from Burundi.

Dry mill models vary across the region, and Burundi stands to benefit from careful study of neighboring countries' experiences in the dry mill segment of the chain. In Rwanda, many washing stations have purchased their own dry milling equipment due to programs supporting the industry (USAID, 2006). In Kenya, the Kenya Planters' Cooperative Union (KPCU) controlled all of the milling until 1995, when liberalization spurred an influx of several new players. By 2010, with 9 millers operating in the country, there have been major concerns about over-capacity (USAID, 2010c). Excess capacity is also a challenge in Tanzania. In 2007/8 mills were operating at approximately 25% of total capacity. This excess capacity is partly the result of liberalization and the refusal of cooperative mills to process private traders' coffee. As in Burundi, coffee in Tanzania remains the property of the grower/cooperative until sale at auction (USAID, 2010f).

Roasting: The roasting stage of the value chain is very small and undeveloped, reflecting the country's low level of domestic coffee consumption, long distance to potential markets, and a weak packaging sector. Roasted coffee is primarily directed to hotels, restaurants and small supermarkets. Minimal exports to the Democratic Republic of the Congo (DRC) and Rwanda have been reported by individual firms (UNIDO, 2013), however these are not reported in national export statistics (UNComtrade, 2013). In 2013, there were four roasters in Burundi: Core Burundi SPRL (Sambi Coffee), Golden Tea & Coffee, African Coffee and Express Coffee Burundi (UNIDO, 2013). While upgrading into the roasting stage of the value chain is considered to be highly attractive, as it accounts for a considerable portion of value in the chain, this is often not feasible for many producing countries, due to distance from major markets, weak packaging and logistics capabilities and relatively weak marketing capabilities.

There are several challenges common to all EAC countries when it comes to upgrading in the roasting stage of production. First, the current end markets for EAC coffee are largely concentrated in Europe, which creates quality problems due to the perishability of roasted coffee. Second, internal demand in EAC countries is generally low (with the exception of Ethiopia), between 2.5 to 7% (Manson, 2009; Uganda Coffee Trade Federation, 2010; USAID, 2010d; AllAfrica, 2011). In the absence of increased demand for roasted beans in the region, expanding roasting capacity has a poor outlook. Third, landlocked Burundi, Rwanda and Uganda are poorly situated to develop faster distribution to distant end markets due to the delays involved with

getting the product to the regional ports in Mombassa and Dar es Salaam (Field Research, 2013). Fourth, packaging capacity, which can help maintain quality in a product during shipping, is still at a basic level in Burundi (Field Research, 2013). In part because of these challenges, governments in Kenya, Tanzania and Uganda have been trying to drive upgrading into the roasting segment of the chain by promoting internal consumption of coffee to develop domestic market (Manson, 2009; Tanzania Coffee Board and Tanzania Coffee Association, 2012; Kamau, 2013). However, there is little evidence that roasted coffee exports are increasing over time from EAC countries despite these efforts to upgrade into roasting (Figure 7), and the share of global imports of roasted from EAC countries is very small.

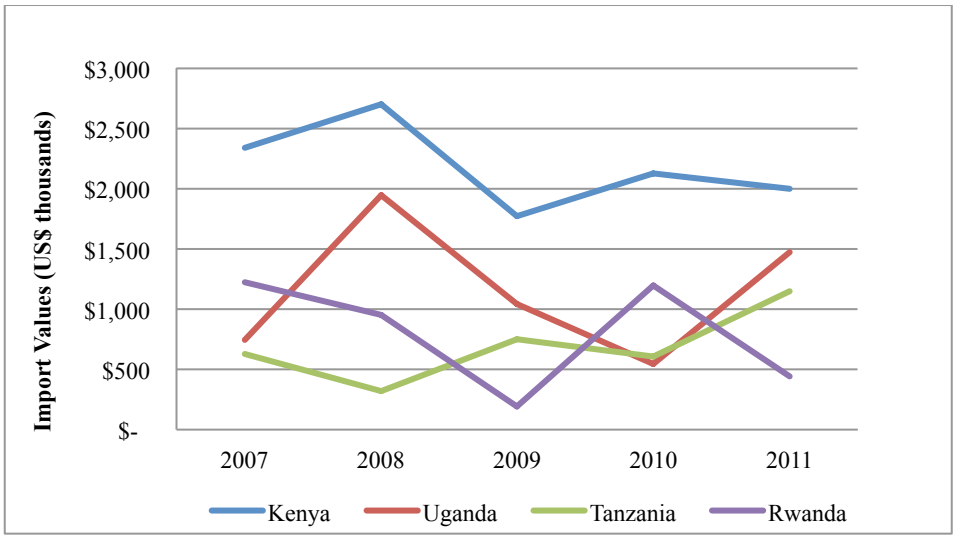
Exports: Since 2006, Burundi has exported an average of approximately 300,000 60kg bags of green coffee per year. Between 2006 and 2008, these exports netted around US$38-39 million (Table 5Table 5). In 2010, revenues doubled as global markets peaked at US$3.09 per pound for commodity coffee, and Burundi made a tentative entry into the specialty coffee market (300,000 kg). Revenues are expected to drop again for 2012 and 2013 as the global coffee price has since tumbled to a four-year low of US$1.27 per lb in October 2013 (Pfeifer, 2013). The top four exporting destinations since 2006 have been Switzerland, the United Kingdom, Belgium and Germany (UN Comtrade, 2013)**.**

Table 5. Exports of Green Coffee, by Volume and Value 2006-2012

	2006	2007	2008	2009	2010	2011	2012
Exports (000, 60 kg bags)	281	356	251	289	307	218	392
Value US$ (Millions)	36.74	38.48	39.46	39.73	70.40	75.19	66.07

Export volumes from ICO, 2013; export values from UN Comtrade, 2013.

Figure 7. World Imports of East African Roasted Coffee



Source: UN Comtrade, HS code 090121, Reporter: 14466 (world aggregate), adjusted to 2011 USD using BLS CPI calculator: http://www.bls.gov/data/inflation_calculator.htm (accessed December 4, 2013).

Three of the top 10 global coffee traders, Louis Dreyfus, Sucafina (Bucafe S.A) and Olam, have operations in Burundi, while there are approximately 25 traders that are registered with *Agence Régulateur de la Filière Café* (ARFIC) (Cafe du Burundi, 2013c). This includes a number of

smaller traders such as Farmers & Co, Cococa, and Cofico. These buyers tend to sell Burundian coffee to the commercial market where it is added to blends (Field Research, 2013). In addition, there are an estimated 35 specialty buyers that have established relationships with producers; these include well-known brands such as Counter Culture, Intelligentsia, Peet's Coffee and Starbucks (USAID, 2013). Whereas Burundian coffees are added to blends in commercial end-markets, the specialty end-market more typically features "single-origin" roasts of Burundian coffee, which are sourced from a single estate or region. The ability to gain access to single-origin marketing channels requires a reliable system for traceability.

Like Burundi, other countries across the region benefited from the boom in coffee prices between 2010 and early 2011, with an estimated increase of 61% in revenues. Rwanda led the region in 2011 in terms of value per kg in exports of green coffee at approximately US$5.03 as a result of strong initiatives to upgrade into the specialty coffee niche (see Box 4, p. 36). Kenya continues to be a strong contributor to that market segment with 4.4% global market share in 2008. Belgium, Germany and Switzerland (see Table 17 in the Appendix) accounted for the lion's share of the region's exports, which is also where the leading roasters and traders are headquartered. These lead firms have a presence in at least one or more country in the region. Like Burundi, all EAC countries also have a number of domestically owned exporters. In fact, in Kenya in 2010, the country's largest exporter was a domestic firm, Dorman's (See Table 18 in the Appendix).

B. The Role of the State in Burundi's Coffee Sector

In addition to the firm-level stakeholders described at each stage of the value chain above, the government also has played an important role in the sector. The state is involved both from a regulatory standpoint and directly in production, since it owns over half the country's washing stations. The Burundian government has a long history of involvement in the coffee sector, which was completely under government control between 1972 and 1992 (USAID, 2013). This section discusses the current role of the state in the coffee sector in Burundi.

Liberalization was first introduced in 1992, but implementation was delayed as a result of the prolonged conflict. More dramatic reforms came into effect in December 2008, beginning with the privatization of the washing and depulping stations and dry mills, followed by the liberalization of government controlled production and export agencies (World Bank, 2011). Both domestic and foreign firms have invested in CWSs. These reforms occurred in parallel with those in other EAC countries which largely liberalized their coffee sectors between 1990 and 2010 (USAID, 2006, 2010c, 2010f). An important implication of liberalization in the sector is that producers were permitted to cut down trees and opt out of the coffee sector, in favor of other crops (many coffee cultivators also produce other crops). As of early 2014, a process is in place to privatize the remaining 77 CWSs which are still state-owned.

The regulatory framework with respect to sales was also changed as part of the liberalization process. This took the form of a shift from an auction-only based system controlled by Office du Café du Burundi (OCIBU)[10] to one combining auction and direct sales for specialty coffee (Cafe du Burundi, 2013c; World Bank, 2011). This mixed model approach is similar to that in Kenya and Tanzania (see Table 20 in Appendix). By allowing for direct contracting, this new system provided important incentives for coffee farmers to invest additional time and effort in their plantations. This paved the way for entry into the higher value specialty and certification coffee niches. At the same time as it promoted specialization, the change in the regulatory framework also led to the removal of minimum price guarantees for farmers, which has left them vulnerable to the volatility of the international commodity markets. The initiative led by Intercafe to ensure that producers receive 72% of the NYFOB price has come under criticism for distorting market

[10] Following privatization and liberalization of the coffee sector OCIBU was restructured and renamed as ARFIC and given a new mandate.

incentives (Integrity, 2013; UN News Center, 2013). However in the absence of credit markets or other mechanisms to smooth incomes, producers currently have access to few other institutional resources during bad harvests or periods of low prices.

OCIBU was restructured as ARFIC, which is now responsible for regulating product quality, providing information to actors in the coffee sector, arbitrating conflicts between coffee sector actors, contributing to policy formulation, monitoring national and international production and market tendencies, authorizing professional licenses and supporting marketing and promotional activities (World Bank, 2011). The agency plays a central role in the day-to-day export operations for all commodity coffee from the country and a more limited role in specialty exports, and a range of actors in the value chain suggest that improved management structures are necessary to enhance the efficiency of the agency, which can currently result in export delays of up to 20 days (Field Research, 2013).

C. Important Constraints Underlying the Development of the Coffee Chain in Burundi

An understanding of the constraints in the development of the coffee GVC is necessary in order to promote a successful upgrading strategy, because these constraints need to be addressed. There are four key constraints that actors cited: the limited supply of mulch and organic fertilizer, inadequate provision of extension services for producers, weak road and transportation infrastructure, and poor access to finance in general across the chain. First, soil fertility in the country's coffee producing region is low as a result of decades of poor soil management and erosion, which undermines agricultural productivity as a whole in the country (Field Research, 2013; Integrity, 2013). Unlike chemical fertilizers, which appear to be more readily available than previously thought (Integrity, 2013), the availability of organic matter for managing soils appears to be very limited (Claes, 2013). Furthermore, no large-scale commercial operations producing and selling organic compost could be identified in the country, even though this accounts for 43% of coffee production costs and suggests an important business opportunity (Integrity, 2013). The lack of development of this important input in the coffee chain appears to be one of the most important problems for productivity in the coffee sector (Integrity, 2013).

Second, both the quantity and quality of extension services are considered to be inadequate within the country, although it is difficult to empirically evaluate this claim. Producers generally have knowledge gaps in terms of soil management techniques, how to produce organic compost from on-farm waste products (Philipp, 2013), maintenance of coffee trees, and harvesting for maximum quality. Extension services face significant operational challenges. Since privatization began, a range of different actors have provided extension services, including cooperatives (primarily CNAC) and private companies (primarily traders or roasters). Some coffee cultivators receive support through MINAGRIE extension services, however these are not tailored specifically to coffee production, and provision of extension services appears to be limited, for most actors. In the private sector, frequent side-selling and contract enforcement problems raise issues of credible commitment which have made private companies reluctant to invest heavily in extension supports. In addition, questions about the quality of extension services are consistently raised, as many agronomists working as extension agents are considered to lack the practical knowledge necessary to convey useful lessons to producers who have low levels of literacy. As a result of this, producers are receiving inadequate support to improve productivity.

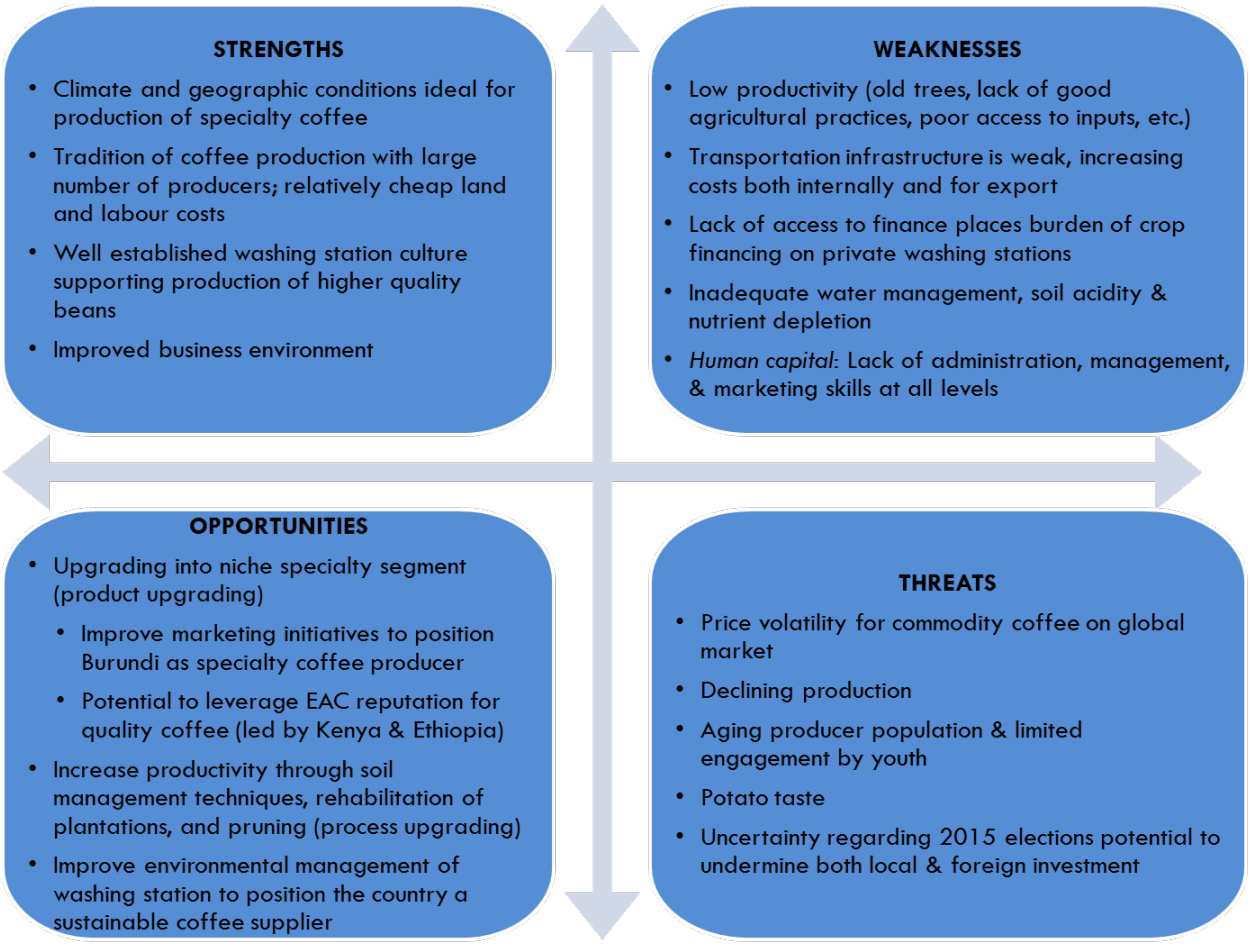
Third, access to finance is, in general, highly limited for the Burundian agribusiness sector as a whole, including the coffee sector, due to perceptions of high risk and a lack of liquidity (Mutabazi, 2013). Given the volatility of the coffee prices and the lack of institutional risk management mechanisms at the national level, potential risks associated with investment in coffee production activities is especially high (Sette, 2011). This appears to have been further exacerbated following privatization, which removed minimum prices and state guarantees for SOGESTAL washing stations (N. Niyungeko, 2010). Access to capital, however, is necessary for

promoting growth in the coffee sector to help producers absorb high upfront costs such as fertilizers, replacement trees or participating in certification schemes. If Burundi seeks to maintain competitiveness in the coffee sector, these market failures must be addressed.

Finally, weak infrastructure and services in the transportation sector also affect agribusiness in Burundi as a whole and the coffee sector, in particular. In coffee, the infrastructure gaps affect the link between producers and washing stations and the linkages between traders and buyers, ultimately having an impact on quality. Mountainous terrain and years of conflict have contributed to poor rural infrastructure in coffee growing regions, which creates delays in delivery of cherries to washing stations. Optimal quality can be achieved when cherries are delivered and processed within 4-6 hours of picking; however, cherries commonly sit for up to a day prior to delivery, undermining their potential quality. Furthermore, the wide geographic distribution of washing stations, combined with a lack of collection services, can lead to spatial monopolies, whereby production in any one area is dependent on the ownership, management and strategies of the nearest washing station. On the export side, Burundi's landlocked nature means that it is subject to higher transportation costs than its neighbors, Kenya and Tanzania. Improving the major inter-regional transportation corridors is necessary to promote competitiveness in the coffee sector, because currently these routes often have major roadblocks and delays (Vrijlandt, 2013). It currently takes approximately 30-40 days and costs US$0.08-0.10/lb to ship coffee to the port at Dar es Salaam; this is approximately 7-10% of the product's price on the New York Stock Exchange, just to reach the Tanzanian coast (Carlson, 2013). These infrastructure challenges must be addressed if the country plans to upgrade into higher-quality specialty coffee segments.

Figure 8 summarizes the key strengths, weaknesses, threats and opportunities that the country faces. These weaknesses need to be overcome in order to take advantages of the great opportunities to participate and upgrade in the coffee GVC.

Figure 8. SWOT Analysis for Burundi Coffee Sector



Source: Authors.

VI. Current Employment and Workforce Development in Burundi Coffee GVC

The previous sections of this report provided a comprehensive exploration of Burundi's position in the GVC from an industry perspective. This portion will unpack how the constraints to upgrading in the coffee sector can be addressed from a human capital development perspective. More specifically, the GVC analysis focuses on the relative change of skill level required for particular upgrading trajectories with respect to the status quo, existing structures to improve those skills and the corresponding investments to fill gaps in that structure. Based on this analysis, the most feasible upgrading trajectories can be identified, prioritized and analyzed with regard to the specific skills to develop and actors to involve.

A. Overview of Current Employment Opportunities in the Coffee Sector

Most of Burundi's employment in the coffee GVC is concentrated in the cultivation stage of the chain, given the high labor intensity in that stage. In Burundi, an estimated 590,000 to 800,000 households are engaged in coffee production (UNIDO, 2013; USAID, 2013; World Bank 2011). Due to the seasonal nature of coffee production, employment also tends to be temporary in nature with peak employment during the three-to-four-month of harvesting and processing season. Employment is also cyclical from year-to-year, driven by fluctuations in the global coffee price and weather patterns, which results in producers periodically entering and exiting the industry. As noted earlier, liberalization has made producer prices more unstable and also made it easier for

producers to exit production; therefore, it has likely contributed to more dramatic cyclicality in employment patterns.[11] Field research indicated that there are currently no actors in the sector, either private or public, that attempt to maintain statistics on total employment in this or any other segment of the value chain. Estimates combining evidence from field research and secondary sources for employment at each stage of the value chain are shown in Table 6.

Table 6: Employment in Burundi by Coffee GVC Segment

GVC Segment	Full-time Employment	Seasonal/Part-time Employment
Production	-	590,000-1,600,000
CWS	-	1,500-2,000
Dry Mills	32-40	800-1,600
Roasting	51	-
Regulation	78	-
Extension Services	-	1290

Source: Duke (UNIDO, 2013; USAID, 2013; World Bank 2011; Kimonyo & Ntiranyibagira, 2007; Field Research, 2013, 2014)

Although employment in the coffee sector is insecure, the sector is a critical source of livelihood for many families. As households produce multiple crops in addition to coffee, and household members may also be involved in off-farm work (D'Haese et al., 2010), a conservative estimate would suggest that 1-2 household members, or approximately 590,000 to 1.6 million people are self-employed in the production segment of the chain. Coffee labor engages several members of the households. Field interviews indicated that women are involved in both the maintenance of trees and the picking of cherries during harvest, while youth often grade and deliver cherries to washing stations. Interviews further indicated that these household members are not likely to receive direct compensation for their labor.

The wet processing stage of the chain provides important rural off-farm employment opportunities, and upgrading into specialty coffee has the potential to create more jobs at this level. Washing stations typically employ between 4-6 permanent employees on site, depending on the size of the operations (Field Research, 2013; USAID, 2013). These employees work on site approximately six months of the year around the three-to-four month coffee campaign focused on procurement, grading and fermentation of cherries, as well as machine operation and maintenance. At the end of the season, these employees are free to engage in other activities (Field Research, 2013). Additional management staff may also be hired to oversee the administration of the washing stations. Total formal employment at five of the SOGESTALs, each of which owns several washing stations, was 1,134 in 2006 (Kimonyo & Ntiranyibagira, 2007).[12] In addition to permanent employees, a number of daily employees are hired to support the operations, particularly with respect to pre-grading cherries, during the campaign. Approximately 1-2 people work per drying table, and the number of tables in operation varies according to the volume of cherries delivered to the station. In 2012, smaller washing stations operating at full capacity (500MT) employed approximately 30 daily workers during the

[11] The 2012 CNAC Annual report documents the percentage of abandoned coffee plots in key areas where it works. The percentage of plantations found to be abandoned was highest in Ngozi (14.3%), followed by Gitega (7%) and Cibitoke (6.6%). Other provinces ranged from 1% to 5%. However, they do not provide comparative numbers from earlier years and thus it is not possible to determine what percentage may be attributed to war displacement, impacts of privatization or the fluctuation in global coffee prices.

[12] In 2012, it was found that SOGESTALs typically had a higher employment costs compared to cooperative- and private sector-owned operations, due to a larger number of management positions, which account for 60% of total costs (USAID, 2013).

campaign (USAID, 2013). A larger operation may employ up to 80 or more daily employees on average (UNIDO, 2013). These employees tend to be hired from local communities and often include coffee producers (Field Research, 2013).

Dry milling operations are based in urban centers in Bujumbura, Gitega and Ngozi, providing a source of urban employment. The number of permanent positions is fairly limited at an average of approximately 8-10 per mill,[13] consisting of semi-skilled personnel to operate the machinery and manage the stock; these individuals typically hold a technical high school diploma (Wege, 2013). In addition, mills hire casual laborers. In 2012, one mill offered temporary employment for approximately 400-450 employees over a six-month period. This figure varies year to year depending on the size of the coffee harvest (UNIDO, 2013). In 2006, the government-owned mill SODECO employed 200 people (Kimonyo & Ntiranyibagira, 2007). A large proportion of these temporary employees are women, and are engaged in grading the coffee by hand to remove defective beans (Cafe du Burundi, 2013b; UNIDO, 2013). While this is temporary work, at least one mill noted that many of these employees return on an annual basis (UNIDO, 2013). With upgrading into higher-quality niches, more employment could be generated at this stage as well due to higher quality control.

Given the relatively small roasting segment in the country, employment in this stage is minimal. One firm surveyed in 2013 indicated that to roast approximately 80kg per day, the company would require 12 full time employees. Assuming that 1,500 MT are roasted locally, this would indicate that roasting activities employ around 51 people.

In addition, there are a range of other jobs in supporting functions, including cooperative management, regulatory and quality monitoring activities at ARFIC, and transportation services. OCIBU previously employed approximately 120 people prior to restructuring as ARFIC. Reflecting the state's weakened position in the coffee sector, ARFIC now employs 78 people.

The above-mentioned activities are distributed across a number of different job profiles. Table 7 provides an overview of the current job profiles in the coffee sector in Burundi.

Specific employment figures are generally also not available for other countries in the region. Typically, estimates include both direct and indirect employment and should be referenced with caution. Coffee provides an estimated 6 million jobs in Kenya and 2 million jobs respectively in Tanzania (USAID, 2010f), with estate farms accounting for approximately 61,000 jobs in any one year in Kenya (Mureithi, 2008). The number of smallholders self-employed in the sector is similar across all countries, with an estimated 500,000 in Rwanda, 400,000 in Tanzania and approximately 500,000 in Uganda (Uganda Coffee, 2013; USAID, 2006, 2010f). Ethiopia's industry employs 8,000 full time and 50,000 part time employees on government owned estates and estimates that as many as 15 million people derive their livelihood from the coffee sector (USAID, 2010b).

Given the similarity in the value chain operations in the different EAC countries, job profiles are likely to follow similar patterns, with a few exceptions. While identifying all specific job profiles in neighboring countries was beyond the scope of this project, certain inferences can be made based on the organization of the coffee sector in these different countries. In Kenya, Uganda and Ethiopia, larger estates offer potential for some degree of skill specialization, particularly in the production stage. New initiatives to improve environmental management in Ethiopia create potential jobs in waste system management, compost production, health and sanitation awareness, and monitoring at CWSs (see Box 6). In Rwanda, emphasis on upgrading into the specialty coffee market resulted in opportunities for cuppers to be trained to work at individual CWSs, and the incorporation of dry milling machinery at CWSs reduced overall employment, because the

[13] Dry mills in Burundi differ in size from 1,200 to 8,000 MT of green coffee per year, this number was reported for a mill of approximately 5,000 MT capacity (Café du Burundi, 2013).

same daily workers could support both sets of activities. Rwandan CWSs each hired an average 45 workers annually between 2001 and 2006 (USAID, 2006). Ugandan and Kenyan roasting operations have also created jobs in roasting machine operations, quality assurance, warehouse management and other activities.

Table 7. Current Job Profiles in the Coffee Global Value Chain

Position	Job Description
Production	
Agronomist	Conduct research to improve coffee seeds, yield & control pests.
Extension Officer	Work with coffee farmers, cooperatives and companies to improve coffee production. Duties may include disseminating technical knowledge on coffee production through training, consultation and developing manuals, may also distribute chemical fertilizers.
Nursery Staff	Plant, cultivate, harvest, transplant coffee seedlings in nursery facilities.
Coffee Grower & Grader	Maintains coffee farms by monitoring coffee plant & fruit growth, applying fertilizers. Manually pick coffee fruits and delivers them to the washing station.
Processing	
General Manager	Manages washing stations including workflow, and working with different line managers for coordination and logistics of coffee processing at washing stations. Manage budget and troubleshoot any management, logistics and personnel challenges. Often also responsible for human resource decisions regarding hiring daily workers, etc.
Production Manager	Oversee procurement and processing of coffee selection from different coffee production zones. Liaise with farmers, and/or traders to identify coffee cherries, meet planned target quantity.
Warehouse Manager	Mange sorting and storage of coffee before and after processing cherries. Ensure proper storage of cherries and beans to avoid molding and other infections and retain quality of coffee.
Machine Operator & Technician	Responsible for operating and maintaining machines in washing stations such as wet mills.
Daily workers	Sort coffee by hands and by flotation. Remove cherries with low density that float on the surface before wet processing.
Dry Mill Operations	
Manager	Oversee procurement and processing of coffee selection from different coffee washing stations or zones as well as managing service contracts to process third-party coffee. Liaise with farmers, quality managers and or traders to identify coffee cherries, meet planned target quantity.
Mechanics/ Technician	Operate and maintain equipment used in the milling processes such as catadors, and UV sorting.
Daily workers	Responsible for grading coffee beans according to quality and size. Female laborers are often used at this stage due to their attention to detail and dexterity.
Sales Personnel	Market and sell coffee to traders and other coffee buyers. Provide coffee samples to potential buyers and transmit information to warehouse managers to prepare coffee shipments.
Warehouse Manager	Manage coffee storage facilities. Store and stack coffee bags according to prescribed methods to retain quality. Verify coffee against receiving and shipping documents.
Shipping/ Documentation Personnel	Work with warehouse managers and customs officials by preparing and processing required documentations for coffee shipments. Inspect and take record of coffee deliveries and shipments.
Truck Operator	Transport coffee from warehouse to ports or collection centers. Deliver coffee safely and timely in good condition. Manage delivery and dispatch paperwork.
Cooperative Administrative Functions	
Cooperative Manager	Cooperative manager provides overall management of cooperatives.
Cooperative Financial Personnel	Process cooperative sales, loans and payments including salaries of cooperative workers and payment of dividends to producers. Keeps financial records of cooperative transactions.
Cooperative Administrative Functions	
SPS Certifier (ARFIC)	Ensure that coffee exports meet SPS requirements for export markets.
Regulator	Coordinate and implement activities to comply with regulations and standard operating procedures to trade green coffee with domestic and international buyers.

Source: Duke CGGC, based on review of secondary literature and interviews and survey.

B. Current Workforce Development Initiatives in Burundi's Coffee GVC

A number of skills training programs have been implemented in the Burundian coffee sector over the last three decades. However, these efforts were too small in scale to have broad impacts (except for washing capabilities, which had strong results), and they were severely hampered by the conflict and coffee price fluctuations of the 1990s. In addition, the formal education institutions have minimal direct involvement in the coffee sector, despite the importance of coffee exports to the country. This section analyzes the lessons learned from previous workforce development initiatives.

Initiatives to support workforce development in Burundi's coffee sector have been implemented in a range of different ways as illustrated in Table 8. These include informal on-the-job training, industry training sessions, training sessions by certification-granting organization, trainings provided by other actors such as foreign buyers, NGOs, donor and international agencies. As the privatization process has moved forward, extension services from the state have rapidly declined in scope, and CNAC is the main provider of trainings to coffee farmers at the national level (donor and private initiatives are geographically limited).[14] However, many farmers cannot afford to attend CNAC training sessions, which must be self-financed (Field research, 2014).

Although these initiatives are seen as powerful tools for skill and knowledge transfer to smallholders with limited basic education (Fernandez-Stark & Bamber, 2012a; TechnoServe, 2011), they have covered a very small portion of the industry and as a result have been ineffective in impacting on the national industry as a whole (USAID, 2013). The USAID BAP program highlighted that they were only able to impact 2% of all coffee producers. This raises an essential question of how to leverage these past successes in a way to achieve the scale required for upgrading in the sector as a whole.

As is clear from Table 8Table 8 the majority of workforce development initiatives have been undertaken by international agencies or NGOs, with USAID playing a critical role between 2007 and 2012. This is not surprising, given the state-control of the sector between 1972 and 2009 and the years of conflict between 1993 and 2005, which weakened institutions and undermined the government's potential to deliver training programs to actors within the value chain. During those years, all pre-existing training initiatives, such as extension services provided by the Ministry of Agriculture were abandoned (UNIDO, 2013). Since the end of the conflict, USAID provided training in good agronomic practices to some 552 DPAE agronomist technicians in 2010 and 2011, and some state-owned CWSs are providing basic training to their workers (Field Research, 2013). However, there is ongoing uncertainty regarding the government's future role in the coffee sector as a result of liberalization, and this ambiguity has hampered investments in skills at the production and processing stages of the chain.

Formal education institutions notably have had very little engagement with the sector, despite the economic importance of coffee to the country; those programs which do exist are targeted at the agricultural sector in general, rather than focusing specifically on skills for the coffee sector (see Table 21Table 21 in the Appendix). There are several agricultural training institutions[15] at the

[14] ARFIC provides advice to CNAC regarding quality standards to be promoted during CNAC trainings.

[15] Agricultural education and training institutions include the *Institut Technique Agricole du Burundi* (ITAB) with several campuses across the country, including Karusi, Mahwa and Kigamba; *Institut Superior de Agriculture* (ISA) in Gitega; the International Institute on Tropical Agriculture (IITA); the Agricultural Business Center run by an Italian NGO focused on vocational training for youth in agricultural production techniques, and two universities, the Faculty of Agronomy and Bio-Engineering (FABI) at the University of Burundi and the Faculty of Agronomy at the University of Ngozi. ITAB offer four year technical A2 diplomas in agriculture while ISA, the two universities offer Bachelor degree programs (Curtis, 2013; Stads & Ndimurirwo, 2011).

technical and professional level, such as the Technical Agriculture Institute (ITAB) system, which train agronomists and technicians for dry milling, for example. However, the curricula are often outdated and not specifically targeted to the coffee sector, such as the largest agronomy program at the University of Burundi. Interviews with the Ministry of Basic and Secondary Education and Vocational Training and the Ministry of Higher Education indicated that these ministries were not planning any courses specifically on the coffee sector (Banyankimbona, 2013; Nshimirimana, 2013). There are also no incentive mechanisms in place for the private sector to engage with the formal education institutions or vice versa. As a result, there is little interaction between the two groups. New initiatives that aim to improve the university, secondary and vocational curricula should focus on developing more direct links with the private sector.

In other developing countries, due to the absence of formal education programs or government run programs, the private sector has often found a way to provide the required training to drive growth in value chains (Gereffi et al., 2011). However, in Burundi, the private sector's capacity to enhance workforce skills has been limited. Several interviewees indicated that many of the new entrepreneurs in the sector since liberalization are new to the coffee industry, and thus have been "learning on the job" (Field Research, 2013). As a result, it is unlikely they would be able to identify skills gaps, develop training initiatives, train trainers and begin to implement the programming in the short time they have been in the sector. It appears that these operations have been relying on the status quo and existing, experienced workers (Field Research, 2013). Employees of the COCOCA cooperative, for example, are former ARFIC employees (Ndumuraro, 2013). More experienced actors in the sector including some firms and cooperatives have been active in providing extension services to ensure producer quality and traceability, particularly for those seeking UTZ and Fairtrade certifications and participating in the Cup of Excellence (CoE) (Field Research, 2013). While this ensures that experienced workers remain in the sector, it also limits the opportunity for young workers to enter the sector.

Table 8. Training Initiatives in the Burundi Coffee GVC, by Segment 2006-2012

Production	Wet Processing	Dry Milling
Production	Wet Processing	Dry Milling
Education Institutions Initiatives		
• Universities in Burundi offer Bachelor degree programs in Agronomy. Curriculum has not been updated in 20 years. No specific focus on coffee sector (Field Research, 2013).	• Technical high schools provide basic technical diplomas. These include technician, construction and plumbing operations as well as some basic agribusiness training, but no specific focus on the coffee sector (Field Research, 2013).	
Government Workforce Initiatives		
• DPAE provide extension services to producers (UNIDO, 2013). General assessment is that these services are inadequate and lack depth in quality to achieve productivity improvements (UNIDO, 2013). • Some government owned washing stations & SOGESTALs provide training to producers on improved production techniques (Field Research, 2013).	.	
Private Sector Workforce Initiatives		
• Some privately owned washing stations provide extension services to producers delivering to their WSs on issues such as traceability and fertilizer application (Field Research, 2013). • CNAC provides extension services to member associations (Integrity, 2013; UNIDO, 2013). Agri Business Services (ABS) noted that they have trained CNAC trainers in best agronomic practices for coffee production (Field Research, 2013). In 2012, CNAC organize a field visit for 18 coffee producers to see results of best practices in action; they have also provided support to strengthen organization management in 61 cooperatives. They also held an internal training	• WS staff in privatized stations already have 15 -20 years experience. Staff retained; minimal on the job training provided (Field Research, 2013). • New WS recruit experienced staff from the labor market. On the job training provided (Field Research, 2013).	• ABS indicated that they provide extension services to dry mills (Field Research, 2013).

program on the Fairtrade certification process. 719 new monitors and 8 new agronomic technicians were also hired thanks to financing from Intercafe (CNAC, 2012). • Intercafe mandated to provide training to producers. Unclear regarding how many trainings have been carried out (UNIDO, 2013). • AFAB provide business development services for their female members to connect with buyers (Nsengiyumva, 2013).	• CNAC note that they have provided training to their WS production managers on quality improvements (CNAC, 2012).	
Multistakeholder Workforce Initiatives		
Technical Skills: • 2007: BAP train 402 associations in improving productivity. 90 associations receive training on quality standards and post-harvest handling (USAID, 2013). This represents roughly 2% of Burundi's coffee producers. • 2010/11: 562 Agronomic technicians (552 DPAE, 10 CNAC) trained in good agronomic practices for coffee (USAID, 2013). • 2011/12: 10,000 pamphlets distributed to CNAC and Intercafe on 18 different good agronomic practices including chemical and organic fertilizer use, composting, water management and harvesting (USAID, 2013). • 2007-2012: 139 Demonstration plots established incorporating a min. of two GAPs (USAID, 2013). • 2010: AFCA provided training in Price Risk Management together with the Agricultural Risk Management Team at the World Bank; Supported by the EU AII ACP Agricultural commodities program (EAFCA, 2013). • 10 trainers trained in organic certification processes in Kenya funded by the EU and supported by BOAM. *Administration Skills:* • 2007: Producers were trained in mechanisms of privatization system and info on market prices was distributed to producer on a monthly basis. • 20 Producer associations trained in cooperative operation, financial and strategic management (USAID, 2013). • Training modules on the role, cost and alternative models for extension services were developed and disseminated to producer associations (USAID, 2013). • Burundi Coffee offer basic computer training skills to producers to improve e-banking skills. • One Acre Fund provide basic financial literacy training for producers with microcredits for fertilizer procurement. (Field Research, 2013). • 2012: Local NGO INADES provided training manuals on the establishment of collection center for coffee cherries, they also provide ongoing support and training to new producer associations (CNAC, 2012). *Interpersonal Skills:* • 300 Female producers received leadership training (USAID, 2013). *Marketing Skills:* • 2008: 19 producer associations trained in marketing best practices including developing business plans, buyer information sheets, direct sales negotiations and good marketing practices (USAID, 2013). • 2007-2012: Two trade show trainings were held for Intercafe presentations (USAID, 2013). • 2007-2012: 10 coffee entrepreneurs attended regional conferences on coffee (USAID, 2013).	*Technical Skills:* • 97 workers at 9 WS trained in quality enhancing techniques, a further 4 WS received training on quality standards and post-harvest handling (USAID, 2013). • 2008 & 2012: 6 training sessions were held each year on coffee cupping and quality control together with the Coffee Quality Institute and international buyers, included integrating younger university and technical school graduates (USAID, 2013). • 371 representatives of Intercafe were trained in improved processing techniques (USAID, 2013). *Administration & Management Skills:* • 2007-2012: 41 WS managers attended training on operations, financial and strategic management of washing stations (USAID, 2013). • 2008: 75 producer associations were trained in how to access financing to purchase washing stations (USAID, 2013). • 2011: Two training sessions were run at SOGESTALs on cost management related to financing human capital (USAID, 2013). • 17 WS received assistance in developing business plans (USAID, 2013). *Marketing Skills:* • 2007: 20 WS received training on marking and quality control service functions (USAID, 2013). • 2011/12: 3 cuppers attended exchange visits to Ethiopia, Rwanda, and Tanzania (USAID, 2013). • 2008: AFCA together with CQI and USAID run advanced star cuppers training program for Burundian and Rwandan trainees in Kigali.	• 2007/8: Specialty buyers visit SVICA to provide direction on improved quality in dry milling and specifics regarding their requirements as buyers (USAID, 2013).
• 2010: AFCA, together with CQI and USAID provided a capacity building workshop for ARFIC employees to "maintain the integrity in the implementation of the Q Coffee System, promotion and protocols. 3 Professional Q Graders from Burundi listed in CQI international database. • 2012: Agriterra have financed advocacy training programs for staff of CNAC (CNAC, 2012).		

C. Key Workforce Development Challenges

This section draws on field research to identify the key workforce development challenges that exist in the Burundian coffee sector. First, there were several concerns regarding the basic preparation and enthusiasm of many of the recipients of training, particularly at the production stage. Most producers are elderly and literacy rates are low (15-20%) (Demeester, 2013). Fluctuating coffee revenues in recent years appear to have lowered producer motivation to engage in coffee cultivation (UNIDO, 2013) and further undermined youth perceptions of coffee as a potentially viable economic activity. These challenges make it very difficult to effectively convey training lessons and obtain results. This is further complicated by the apparent lack of practical experience of many of the agronomists working in the sector. As a result of the conflict, formal education was confined largely to the classroom, and today agronomists have little practical expertise (Cliff, 2013). Due to capacity constraints, university-level agronomy training is reported to be primarily theoretical, rather than practical, so current graduates are poorly prepared to help farmers solve problems in specific, real-world contexts (Field research, 2014). In addition, producers have also generally been considered farmers rather than business owners, and they have limited skills in basic administrative functions. For example, many producers do not keep track of their annual production, making it very difficult for washing stations and private firms to assess potential supply and establish procurement contracts with larger traders.

Second, trained technicians and professionals are often not keen to move to rural areas (Field Research, 2013). University degrees are typically offered in urban centers, and graduating agronomists reportedly are not willing to move to the coffee growing areas after completing their studies—even if it means entering other career paths. In addition, for similar reasons, it is difficult to find qualified local managers who are capable of managing CWSs, keeping track of distribution of inputs, deliveries, engaging with suppliers, etc. (Field Research, 2013). Given the importance of CWSs on the provision of credit and extension services to producers and downstream impacts of securing marketing channels, the lack of skilled management at this level can undermine other efforts to improve the chain's operations.

Third, the cyclical and temporary nature of employment (section VI.A), combined with side-selling and the lack of contract enforcement has made the private sector less willing to invest in human capital due to low returns on investment (Gereffi et al., 2011). As companies have no guarantees that their temporary staff will return year-on-year, or that trained producers will deliver their cherries to the CWS, they are likely to under-invest. Indeed, after high side-selling in their first year of operations, one company reduced their extension services to producers by over 75% (Field Research, 2013).

Fourth, human resources management is not a widely incorporated tool in Burundian business models. There are no diploma or degree programs offered at the tertiary level in human resources. At a national level, poor business registries, poor data collection skills and the large share of the informal economy further hamper empirical assessment of skills. Information collected at the university level remains incomplete, as many private universities have not reported data to the Ministry of Higher Education. At the technical and vocational training level, the first initiatives focused on assessing demand to tailor skills supply was carried out by BTC in Burundi in mid-2013. The resulting report, which describes labor supply and demand across multiple sectors in each province, indicated that programming lacks coordination and is poorly suited to labor market needs, as job placement rates are estimated to be only 15-20% (BTC, 2013), indicating that the TVET system lacks the capability to identify labor market demand. These shortcomings in human resources management training and information limits the potential to identify skills gaps and engage in targeted recruiting or training programs to overcome those shortcomings.

Fifth, institutionalizing the knowledge transferred from international donor programs in the context of continued but more disparate aid, however, is challenging. Intercafe plays an important role in this; however, generally, they were not perceived to have the capacity to adequately

continue to offer the required training and support on an ongoing basis. One private sector firm, Agri Business Services, did emerge that had hired some members of the USAID operations team. This firm appears to be technically well positioned to train other trainers, but with just three permanent employees, the organization is too small to provide adequate coverage, and they face constraints from clients who are not in a financial position to invest in training (T. Niyungeko & Kamwenubusa, 2013).

VII. Improving Burundi's Competitiveness in the Coffee GVC: Potential Upgrading Strategies

Based on the analyses of the competitive dynamics of the global sector, Burundi's position within the coffee GVC, and a review of existing workforce development needs and structures, the following upgrading trajectories are recommended in the short and medium term:

- Product upgrading into specialty coffee niche [Short-medium term]
- Process upgrading to drive productivity [Short term]
- Environmental upgrading to improve water management & increase availability of compost materials [Medium term]

These strategies were prioritized due to their feasibility under the current post-conflict context, the existing state of the workforce and WFD institutions, and their potential to contribute to improved livelihoods for a large portion of the population while also offering select, higher skilled job opportunities. In comparison, given Burundi's existing position across the most labor intensive cultivation and processing stages of the chain, the remaining upgrading opportunities into roasting and marketing & distribution require the development of a small number of more skilled job profiles rather than fostering widespread employment creation or driving the necessary labor productivity improvements of the current workforce. These other upgrading trajectories are also hampered by lack of competitive advantage with respect to geographic location, poor transportation infrastructure and distribution services, the lack of a local packaging industry and weak overall marketing skills.

Implementing these upgrading strategies will require that firms and other industry stakeholders are able to overcome key challenges. These challenges are specific to each separate upgrading strategy. Achieving product upgrading through movement into the specialty niche will require solutions to the currently poor state of rural infrastructure and the relative weakness of existing marketing skills. The key challenges related to process upgrading, on the other hand, include poor soil fertility and the inadequate state of extension services. Environmental upgrading will require addressing constraints related to access to finance, particularly with respect to washing stations.

Each of the three proposed upgrading trajectories are discussed below. Drawing on case examples from other countries that have followed similar approaches in the past, the text highlights why it may be important for Burundi to pursue this strategy, how it can be achieved and what the expected outcomes may be – both with respect to revenue improvements and job creation. Indeed, the commitment of important financial, and human capital resources to achieve these upgrading trajectories in the current post-conflict, budget constrained context must be carefully evaluated with respect to these potential outcomes.

A. Product Upgrading: Specialty Coffee Niche

Low and fluctuating prices on the international coffee market since the coffee crisis of the early 2000s are likely to continue in coming years as large suppliers expand their Arabica crops. Given Burundi's low market share and its dependence on coffee exports for foreign exchange revenues and employment, the country has little ability to protect itself or its producers from these fluctuating prices. If prices continue to fall, Burundi should expect to see a decline in both on-

farm and downstream employment and revenues in the sector,[16] as producers prioritize subsistence farming for food or crops that can generate more cash (Kaboneka, 2013). Margins in palm oil production, for example, are as much as 50% higher than in Arabica coffee (Muheto, 2013), and producers have already shifted to this as well as other crops such as cassava and bananas, to optimize land use (Makangira, 2013).

While competitiveness in the commodity coffee sector is under significant threat, Burundi does have a specific comparative advantage in the production of high-quality, specialty coffee as a result of favorable geographical characteristics (USAID, 2013). This is supported by an extensive infrastructure of 185 washing stations already established in key coffee growing areas[17] and staff averaging 15-20 years of experience in producing washed coffee. Furthermore, specialty coffee from Burundi has been shown to net three or more times the price for commercially traded coffee. Revenue generated for farmers from this coffee were as high as US$3 million in 2011 (USAID, 2013), that is, US$2 million more than if the same coffee had been sold as commercial grade. Currently, however, only an estimated 4-7% of Burundian coffee is exported to the specialty market (USAID, 2013). Outdated production practices, combined with aging trees, the lack of traceability systems, insufficient market linkages and physical constraints, such as the distance to deliver cherries, have to date limited upgrading into specialty markets.

Burundi can upgrade into both the specialty and certified coffee niches. Certifications have been considered an important potential market in Burundi for some time. However, questions about whether the costs outweigh the benefits of certification and an oversupply of certified coffee may make it more difficult to pursue upgrading in this niche (Haggar et al., 2012; Ruben & Fort, 2012). Indeed, one Burundian washing station sold its Fairtrade certified coffee as commercial grade coffee in 2013 because it did not know how to find a potential buyer (Makangira, 2013; Ndumuraro, 2013). Specialty coffee, on the other hand, is more promising because prices are determined by the quality of the lot and the exclusivity of supply, rather than the NYFOB price. This can thus provide higher potential returns than certification. Ethiopia, for example, saw success upgrading via the specialty market segment during the first decade of the 2000s by both creating mechanisms to incentivize production of high-quality coffee and also moving into the marketing section of the value chain, through its branding initiatives and aggressive efforts to build marketing channels with buyers (Light Years IP, 2011).[18]

However both strategies – obtaining certifications and successfully selling differentiated coffee – depend on the ability of actors within the country to establish effective market linkages. The lack of marketing skills appears to be pervasive across the Burundian economy. This is possibly the result of a recent history of heavy state involvement in the economy and years of conflict resulting in relative isolation from competition. Several continued initiatives aimed at improving market linkages will be essential to raising Burundi's profile as a specialty producer, drawing buyers and roasters to see the country for themselves and creating linkages between producing organizations and buyers. These include organizing trade missions for buyers to the country, continued hosting of the Cup of Excellence competition and other events including the Africa Fine Coffee Conference in February 2014 and developing a "compelling story" to engage socially and environmentally conscious buyers. Table 9Table 9 provides an extensive list of recommended steps for achieving product upgrading in the coffee GVC and identifies actors that could carry these out. For those actions in which local actors will need to participate, specific training approaches are provided in the recommendations section.

[16] Revenues for coffee declined on average by 38% from 2011 to 2012 (Integrity, 2013).

[17] At least half of these are in good operating condition due to modernization following privatization.

[18] Ethiopia also expanded certification efforts during the 2000's in order to expand access to the certified coffee segment. Thus, certification and quality strategies are not mutually exclusive.

Table 9. Important Steps for Achieving Product Upgrading in Burundi

Action	Description	Reason	Potential Actors
Updated & targeted needs assessment	Assessment of coffee production, tree ages, soil & leaf analyses and agronomic techniques being used in coffee growing regions at an altitude over 1,500 m	This needs assessment is essential to estimate the number of trees that may be required for replanting over a given period of time and the different training programs for improving agricultural practices.	CNAC, DPAE, Private Sector, ISABU and University of Burundi.
Incorporation of good agricultural practices, harvesting techniques and traceability protocols in key areas of the country	Develop and provide technical training based on good agricultural practices, coffee picking protocols and carry out trainings.	Process improvements in production are essential to achieving quality improvements; improving picking and grading is the first step to ensuring high quality berries with low defects and training ensures producers are aware of the importance of delivering cherries to the washing stations within 4-6 hours	Private sector, ISABU, CNAC, University of Burundi, Agri Business Services *Note: Leverage materials already developed (USAID, 2013).*
Targeted needs assessments of washing station practices	Assessment of practices being carried out at the country's washing stations and dry mills.	Washing and milling coffee cherries and parchment does not improve the quality of can degrade it, and failure to maintain accurate traceability can undermine potential gains in production. Significant existing domestic knowledge on processing techniques should be disseminated; new updated protocols should also be added.	CNAC, Private Sector, SOGESTALs, managers of state-owned operations. *Note: Leverage assessment carried out in 2012 on washing stations practices (USAID, 2013).*
Perform cost/benefit analysis for certifications	Assess the relative costs and benefits of each of the certification operations and identify optimum balance between certifications for particular markets, and identify where specialty coffee qualifications alone will be sufficient.	Given the high costs and complications associated with certification processes, and the varying impact of these on producers revenue, on the other hand, the cost of producing high quality coffee with no certification costs, further analysis is required to determine which approach is best suited to different areas in the country.	World Bank, Intercafe, international consultants
Increase the number of qualified cuppers at washing stations and dry mills	Train cuppers to work at the washing station and dry mill level to determine quality of the coffee.	Each washing station producing specialty coffee must be able to accurately assess its own quality in order to make improvements in processes.	Coffee Quality Center in Ngozi; Coffee Quality Institute; AFCA; buyers
Strengthen existing market linkages and develop new ones.	Identify key markets for specialty coffee; continue to host CoE and other events.	Given Burundi's still emerging reputation as a specialty coffee producer and continued perceptions of instability and insecurity, buyers will need to be wooed for some time still.	Intercafe, AFCA;
Develop branding initiative for Burundi & its coffee	Develop a marketing and branding campaign for Burundi that can be used to help promote its coffee.	The specialty segment is also competitive. Rwanda is known as "The Land of a Thousand Hills" and the role of smallholder coffee producers in rebuilding the country provides a compelling narrative (USAID, 2006). Costa Rica is known for its keen focus on sustainability and protecting the environment, and the exceptional quality of Ethiopia's Harar Yirgacheffe and Sidamo coffees is recognized worlwide. What is Burundi's "brand"?	International marketing and branding experts;

Movement towards the differentiated coffee market niche is being supported by numerous different actors including the government, large private firms and smaller cooperatives supported by NGOs. Pursuing quality improvements has been broadly identified by policy makers in Burundi as part of the country's broader strategy to help support poverty reduction (IMF, 2012) and during the opening session of the AFCA 2014 conference, the Minister of Agriculture announced one of the sector goals is to export all Burundian coffee as certified coffee (AFCA Opening September 2013). Bigger companies (such as Webcor) as well as smaller coffee cooperatives, CNAC and traders all aim to shift towards specialty coffee (Field Research, 2013; UNIDO, 2013). However, to date, most initiatives have focused on certification in UTZ and/or Fair Trade, with insufficient focus on developing unique market linkages or a country brand. This value chain analysis thus supports these initial strategies by providing some specific action steps to achieving these goals, while also raising key questions regarding which approach or combination of approaches may be relevant to the country. As discussed above, a more nuanced approach may be more desirable for building long-term competitiveness and effective use of limited budgets, particularly given the current credit constraints in the country.

Burundi's accession into the EAC as well as increased economic and political linkages with the broader East Africa region could have overall positive impact on the country's branding initiatives. Other countries in the region, particularly the predominantly Arabica producing countries of Ethiopia, Kenya and Rwanda are all simultaneously trying to drive product upgrading into the specialty niche market. With the strength of the Ethiopian and Kenyan marketing initiatives, and the growing recognition in quality of Rwandan coffee (see Box 4), Burundian coffee can only benefit from growing its regional associations and branding itself as "East African." Furthermore, membership in the EAC allows for improved labor mobility and can help the country take advantage of opportunities to leverage training resources and expertise in these other countries by sending students to study abroad, bringing in regional experts or offering exchange opportunities for producers to learn production operations in neighboring countries. For example, Burundian skills in the CWS segment of the chain were engaged in Rwanda's upgrading initiative in the early 2000s (see Box 4).

Expected Outcomes:

1) **Increased quality can result in higher prices for coffee cherries.** This increases the income per unit of land engaged in coffee cultivation and can help to compensate for overall declines in revenue from falling production in addition to creating more stable longer term relationships with buyers. The implementation of the direct sales system, which fosters increased interaction between buyers and producers and ensures producers are incentivized for their efforts, has resulted in higher quality coffee through the direct training of farmers and the creation of "transparency contracts" that create sustainable relationships (Cafe du Burundi, 2013c; USAID, 2013). Prices paid for winners of the CoE competition in Burundi in 2012 were as high as US$23.40/lb compared to $1.57/lb on the New York Exchange (USAID, 2013). In the recent 2013 auction, the winning price was even higher at US$25.20 at a time when the NYFOB price hit a four-year low (Alliance for Coffee Excellence, 2013). Table 10 details the increase in direct contracts between 2009 and 2011. The average price for specialty coffee is considerably higher than the average national price paid to producers, which has been stable at approximately US$1.89 during the same period (ICO, 2013).

Table 10. Direct Contracts on the Specialty Coffee Market and Farmers Revenues

	2009	2010	2011
Amount of fully washed direct sales contracts done by assisted CWSs	282,120	509,940	474,540
Average price for specialty coffee in $ per kg	3.3	4.62	6.3
Income to farmers ($)	930,996	2,355,922	2,989,602

Source: USAID, 2013.

2) **Increasing incomes can attract youth to coffee production**. In Burundi, as in many other coffee producers in the world, youth have partly disengaged with the sector because they do not see coffee production, or even the broader agricultural sector, as a viable vocation (Brooks et al., 2013). As a result, the average age of producers continues to grow. Improved returns for coffee production can help to retain these young individuals in agriculture, and the improved technical, marketing and interpersonal skills that they develop in the medium term can be transferred to other product segments in the agricultural sector. As shown in the companion report on Burundi's agribusiness value chain, current productivity across the agricultural sector is low, producers do not recognize the market potential of their crops, and post-harvest processing is limited due to insufficient raw materials. Improving agricultural production could thus generate improved downstream employment opportunities in the agri-processing industry. COOPAIN, a cooperative of coffee and cocoa producers in Peru, faced similar problems in the late 2000s. The region in which it was operating was recently emerging from years of trade in illicit coca production, and poor returns on coffee tempted youth in precarious situations to turn to illegal activities (USAID, 2006). By pursuing organic certification for the high value markets, the cooperative was able to increase returns for farmers by approximately 15% and invest in a chocolate processing plant. Even though this is significantly lower than the increase in returns expected for Burundi's specialty coffee, it was sufficient to re-engage youth in productive activities (Martin & Choy Paz, 2012).

3) **A small number of higher skilled positions can be created for off-farm employment.** In particular, these positions include coffee cuppers at the washing station, dry mill, and/or export level; quality managers at the washing station to supervise extension services and ensure quality beans are being produced and harvested at the correct time and according to all certification requirements; and teams of marketing professionals to implement the country's brand strategy. In addition, should demand justify it, third party certification auditors may open offices in Burundi, as they have in Kenya, to reduce their overhead in ongoing audits of certified washing stations. Cupper positions have been identified as strong opportunities for the younger generation (USAID, 2013), while the quality manager positions could provide an excellent opportunity for underemployed agronomists, should they be willing to work outside of Bujumbura. To be qualified as specialty grade, a coffee must be tested in country by three licensed Q-graders. Costa Rica, which accounts for 10.4% of the specialty market has 35 Q-graders, compared to no more than six in Burundi (Coffee Quality Institute, 2013). While the marketing strategy itself may be best developed by global experts, they will require some local team members to assist in the implementation of the strategy.

4) **A number of jobs may be created for extension agents to provide the required training on good agricultural practices (GAP) for coffee production.** Analysis of current workforce development initiatives in the country suggests that while there are extension agents engaged in the coffee sector, employed by the government, CNAC and other private sector companies, the overall supply is considered insufficient to reach the total coffee producing population. Initial plans to improve outreach by CNAC led them to hire an additional 719 new monitors and eight agronomist technicians in 2012 alone (CNAC, 2012). While complete information regarding the number of extension agents in the country is unknown, this organization represents under one-third of all producers, suggesting that there is potential for further hires.

Box 4. Product and Functional Upgrading in Rwanda: Increasing Specialty Coffee Sales

In the early 1990s, despite having been a long-time coffee producer, Rwanda began to experience a significant decline in production. In 1992, production stood at 38,970 MT, however, by 1996, this had declined by more than half to 15,239MT. Inefficient and ineffective farming methods combined with aging trees and low quality beans from the use of drying methods significantly undermined both productivity and quality. Furthermore, prices were particularly low during that period, with producers receiving as little as US$0.18 per lb. of green coffee regardless of quality, below their production costs. With little incentive to improve production, producers began to exit the industry, and Rwanda's competitiveness on the world coffee market suffered a major setback. This was a major problem for Rwanda. As in Burundi, coffee plays an integral role in Rwanda's economy, contributing significantly to the country's foreign exchange earnings and providing cash incomes for 500,000 smallholder farmers. Maintaining employment and ensuring foreign earnings was essential to support the country's post-conflict recovery. The Government of Rwanda, together with the donor community, thus began to define a strategy for the country's coffee sector. This strategy aimed to improve quality by repositioning the country as a specialty coffee producer, in order to increase returns at production and also achieve national development goals of boosting national revenues and expanding employment.

This product upgrading into the specialty coffee sector required a wide range of initiatives led by a variety of different actors at both the national and international level. It also required simultaneous upgrading into the marketing segment of the value chain to ensure that the high quality coffee produced would net the necessary premiums to justify ongoing investments by producers. These initiatives can be divided into five key areas:

Changes to the Regulatory Framework: The first major change initiated by the government was the liberalization of the coffee sector, which allowed producers to establish cooperatives, directly contract with buyers, or exit the industry. This facilitated the development of the private sector and ensured the direct transfer of premiums to the producers. The government, however, remained involved in the sector, publishing the 2004 Horizon 2010 Coffee Action Plan, and updating this again in 2009. This strategy mandated the continued engagement of the Rwandan Agricultural Sciences Research Institute (ISAR) and OCIR in improving quality in the sector and establishing "Rwanda Origin" and other credible mechanisms to improve traceability. In 2006, OCIR made the important decision to move away from the commercial coffee sector and focus entirely on the specialty market niche.

Quality improvements through Production and Processing Stages: Major efforts were made to improve quality. New seedlings were distributed and farmers were trained in plantation establishment and maintenance, as well as in GAPs and crop husbandry. Agronomy students at the University of Rwanda were also provided specific training about the coffee sector. The formation of cooperatives was actively encouraged and supported by a wide range of donors, including the USAID, PEARL and ADCI-VOCA programs. Project Rwanda delivered over 2,000 "coffee bikes" to coffee producing areas in order to improve the speed with which cherries would be delivered to the mills (and thus allowing producers to fetch additional premiums). Over 100 CWSs were designed, financed and constructed between 2000 and 2011, allowing Rwanda to shift from traditional dry processing mechanisms towards wet-processing techniques that produce higher quality coffee. Processing experts from Burundi and Kenya provided training regarding the installation, operation and maintenance of equipment, cherry selection, fermentation, puling, lot identification, etc. In addition, technical assistance was provided to improve quality management and cupping techniques so that wet mill managers were better able to recognize the relative quality of their products. In addition, mill managers were provided with personnel and financial management training to improve the administration efficiency. Producers and wet-mills alike received training on fair trade and rainforest certifications.

Entry into the Marketing Stage of the Value Chain: Ensuring that Rwanda's new high quality coffee entered the specialty market (rather than ending up on the commodity market) has been essential to the sustainability of the product upgrading strategy. Several key initiatives have been carried out. First, donors hired a US-based coffee marketing specialist and co-financed an inbound trade mission with leading specialty roasters in 2002. These projects also provided support for representatives of the coffee sector to attend international coffee shows, leading to a contract with Starbucks in 2004.

Second, the country was the first African country to host the CoE in 2008. In has subsequently hosted the event four times (2010, 2011, 2012, 2013), ensuring a high level of visibility for Rwandan specialty coffee on the international market. Third, donor programs have supported cooperatives in developing marketing materials, established an outreach center with market information for coffee associations and provided training in negotiations with clients. Finally, the government has placed an emphasis on celebrating successes in the sector and driving media coverage for events. For example, in 2002 when Rwandan specialty coffee was launched at Sainsbury's, a leading British supermarket, the Rwandan Minister of Commerce personally attended the ceremony. Similarly, at the first CoE, President Kagame awarded prizes to the top two winning lots, and in 2010, the Prime Minister was at hand to award the top three winners their prizes.

Supporting Institutions and Services Strengthened: Domestic actors and donors undertook several actions to improve the quality of supporting institutions and services, including finance. SNV Rwanda provided capacity-building to OCRI to support the organization in its roles creating policy, regulating quality, providing certificates of origin, and supporting branding initiatives. USAID PEARL established a Development Credit Authority loan guarantee program, administered through a local bank, for the construction of CWSs and the purchase of coffee cherries. Loan officers and other bank personnel were trained in accurately assessing risk and financial viability of different projects within the chain. Training included site visits, round table discussions with all stakeholders on risk mitigation and the participation of a delegation of finance officers to an international coffee fair to improve their understanding of the coffee sector.

Unfortunately, impact evaluations of these initiatives in Rwanda have been limited, making it difficult to assess the exact outcomes of specific initiatives. However, as a whole, following this period, the following outcomes were observed:

Increased sales of specialty coffee and share of overall production: In 2002, the first 33MT container of specialty coffee was exported. By 2005, 1,190 MT of specialty coffee were produced and sold at US$3.10/lb. and by 2006, the country was selling specialty coffee to over 30 buyers in the US, the EU and Japan. In 2009, production reached 3,045 MT. By 2010, specialty coffee accounted for 20% of the country's coffee production. During this same period, production of all coffee in the sector peaked at 450,000 60kg bags in 2004, declining by approximately 50% by 2013.

Increased income & revenue: Between 2001 and 2006, 50,000 rural households saw their income double. Revenues from specialty coffee reached US$3.6 million in 2006 and US$11.6 million in 2009. Improved production techniques and upgraded CWSs also facilitated an increase in the overall output of fully washed coffee, which fetches a higher price even for commercial grade coffee. The country's coffee export earnings rose from US$16 million in 2002 to US$71 million in 2011 despite corresponding overall declines in exports, and the price per kilogram rose steadily from US$1.84 in 2006 to US$3.59 in 2011.

Employment gains: While assessments of employment in the sector are limited, between 2001 and 2006, the construction of the new CWSs in the sector provided temporary employment with a final 2,000 new jobs created at the 46 CWS built during that time. Significant additional employment was likely created as a result of further doubling the number of CWS between 2006 and 2012.

Household Impacts: One survey showed that coffee farmers have increased their food consumption and their overall household expenditure, leading to improved food security and to generally improving economic conditions for coffee farmers. One cooperative, COCAMU, having tripled its turnover between 2007 and 2009, began providing health insurance to their members and their families in 2009.

However, important challenges remain: Only a portion of the country's 500,000 producers have shifted to the production of specialty coffee, and at 20% the country appears to be falling short of its ambitious goal of producing 100% specialty coffee by 2015. Poor transportation infrastructure continues to inhibit the domestic distribution of inputs and transport of cherries and beans, as well as the international exports of product to the ports. This adds cost and reduces the country's competitiveness. As in Burundi, the country's coffee production is affected by the potato taste, and broader spread of

traceability techniques and additional R&D are required to identify the cause and eradicate or manage it. Producers are also not receiving high enough premiums to incentivize them to increase the quality of their coffee and there continues to be insufficient coordination of extension services. There also appear to be problems at the CWSs in terms of sufficient technical knowledge about fermentation and selection of high quality cherries.

Nonetheless, as a result of these upgrading strategies, Rwanda was able to re-establish a competitive position in the coffee GVC, generate substantial employment opportunities and increase export earnings from the coffee sector. The skills developed through coffee-oriented trainings, including risk management in the financial sector, plantation management at the production level, and the implementation of traceability and personnel management at the washing station level, are all transferable to the broader agribusiness sector, and even other economic sectors.

B. Process Upgrading to Improve Productivity of Commodity Coffee

A second upgrading trajectory that Burundi could pursue is to improve the productivity of the commodity coffee, as it will not be likely for all producers to move to specialty coffee (product upgrading). Productivity in Burundi's coffee sector continues to be low, at approximately 30% of global averages, and as a result producers earn less than their production costs (Integrity, 2013), and overall production levels are thus declining (ICO, 2013c). The reliability of Burundi's coffee supply is further impacted by unpredictable export procedures and lengthy and expensive transportation. This is a constraint to access more stable contracts in the commercial coffee sector as buyers want guarantees of regular delivery and minimum quantities (Field Research, 2013).

Although producers have been growing coffee in Burundi for decades, producers have not incorporated improved agricultural practices at the farm level, affecting both the quality and quantity of production (USAID, 2013). As a result, the simple incorporation of better agronomic techniques may significantly improve yields. For example, demonstration plots in Ngozi and Kayanza in 2011 and 2012 incorporating GAPs doubled and even tripled productivity in some cases, while reducing production costs by half (Integrity, 2013). Similar results have been seen in other coffee growing areas in the region. The Coffee Initiative training program in East Africa described in Box 5, demonstrates that implementing these new methods for smallholder coffee producers in the region can increase yields by an average of 42%, while simultaneously improving quality (TechnoServe, 2011). In Kenya, a shorter program carried out by a consortium of value chain actors, including a roaster (Tchibo), trader (ECOM), an international development agency (GIZ), the 4Cs certification association and partially funded by the World Bank, saw increases of 15% in production after just two years, while the prices in cherries tripled (GIZ, 2013). With these types of results, some producers may even choose to remain in commodity coffee in the long term.

Achieving these upgrading initiatives at a larger scale to obtain significant results at the national level requires several different actions to be undertaken in the country (Table 11). These combine data collection, curriculum development, training programs for extension agents and producers and coordination with actors in upstream and downstream segments of the chain.

Low productivity has been highlighted by policymakers and numerous actors in the agribusiness value chains as a key factor undermining not just the potential of the coffee crop, but the whole agricultural sector (IMF, 2012). In the coffee sector, nonetheless, there appears to be a lack of consensus over how to identify the root cause of the problem. The country's 2012 Poverty Reduction Strategy Paper attributes low productivity to aging trees (IMF, 2012), while many others have attributed it to the low supply (and correspondingly high price) of chemical fertilizer (Field Research, 2013). In 2013, together with donors, the government will launch a nationwide fertilizer subsidy program, reducing the cost to producers by 40% (Field Research, 2013), although recent studies find that it is a low rate of organic fertilizer and mulch rather than chemical fertilizer that is the problem (Integrity, 2013). Thus, by suggesting a first step of providing an up-to-date, region-specific analysis of soils, tree conditions and current practices,

the upgrading strategy discussed above can help ensure that initiatives are tailored to the specific problems/areas to better ensure that scarce resources are not spent on unnecessary programs.

As with product upgrading, the labor mobility facilitated by Burundi's position within the EAC can help the sector gain access to expertise in the region, particularly expertise developed through the Coffee Initiative in Ethiopia, Kenya, Rwanda and Tanzania – as described in Box 5.

Expected Outcomes

1) **Increased yield and quality of coffee can result in higher revenue for the producer per land unit under coffee cultivation**. This can translate to increased incomes for the farmer and potentially encourage producers to remain in the sector. As with certification premiums, depending on how producers are encouraged to use this extra income, this deliver results in quality of life, increased education for children, improved investments in other agribusiness crops, amongst others (Jena et al., 2012; Ruben & Fort, 2012; Valkila & Nygren, 20009).
2) **Increased production among remaining producers can make up for the exit of others.** As discussed, depressed global prices and other factors will likely result in some producers opting out of the sector. Maintaining overall supply levels ensures the maintenance of downstream employment at existing CWS and dry mills. Should productivity increase significantly, this could support additional job creation on a temporary basis at CWSs operating at under capacity or newly constructed stations.
3) **Stabilizing or increasing coffee sales maintains continued foreign exchange revenue for the country.** In the short to medium term, as the country diversifies its export base, it will continue to be heavily dependent on coffee export for foreign exchange revenue. Amongst other things, this foreign exchange is essential for fuel imports as well as the import of capital equipment to support upgrading in other sectors, and the agro-processing industry in particular.
4) **Improved agricultural practices in coffee production can improve quality.** These initiatives are closely linked with quality improvements, with potential rejection rates falling by as much as 50%. Many of these practices are also already included in the requirements of several certifications. These improved practices can also thus help drive the country's upgrading ambitions in the specialty market niche.

The most important constraints identified to implementing the actions required for upgrading concern limitations with respect to the adequate supply of qualified extension agents in the country. Currently, privately owned washing stations, cooperatives, Intercafe and CNAC provide some training for producers. However, there are strong indications from members of the coffee industry in Burundi that extension services are inadequate; that extension agents lack practical experience; that the agronomy curriculum in Burundi's university system does not include specific programs related to the coffee sector; that agronomists lack practical experience as a result of limited field training during the conflict; and that the curriculum has not been updated in the past twenty years to reflect innovations and modern agricultural techniques that have been adopted in the sector. Furthermore, concerns were expressed regarding transportation of the existing field agents to travel to producers' farms. These challenges will need to be overcome.

Table 11. Important Steps for Achieving Process Upgrading in Burundi

Action	Description	Reason	Potential Actors
Updated needs assessment	Assessment of coffee production, tree ages, soil & leaf analyses and agronomic techniques being used in coffee growing regions. Identified other mayor issues for low productivity such as: pruning, harvesting, nutrients, etc.	This needs assessment is essential to estimate the number of trees that may be required for replanting over a given period of time and the different training programs for improving agricultural practices. Some information exists (e.g. CNAC & ARFIC), however, it is dispersed, making decision making challenging.	ARFIC, CNAC, DPAE, Private Sector, ISABU and University of Burundi.
Incorporation of good agricultural practices	Develop and provide technical training at a Train-the Trainer and Trainer-Producer level based on good agricultural practices for the coffee sector	Process improvements in production are essential to achieving quality improvements.	Private sector, ISABU, University of Burundi, Agri Business Services
Combine training with on-farm monitoring	Targeted training programs should be combined with on-farm monitoring visits by extension agents in coffee growing areas, over multiple seasons.	Monitoring ensures that best practices are implemented immediately & any doubts can be clarified at the farmer's plantation or through demonstration on lead farmers plots.	CNAC, Private Sector, DPAE, Intercafe, Donors
Establish a tree replacement program	Establish a program for tree replacement that accounts for producers lost earnings as the tree reaches maturity.	Prior to privatization it was illegal to cut down coffee trees; since then producers have been reluctant to cut down aging trees due to lost potential income.	CNAC, Private Sector, Intercafe, Donors *Note: leverage existing USAID BAP established program for financing tree replacement.*
Processing & transportation capacity	Evaluate potential additional washing station capacity and transportation requirements for increased productivity	This is essential to ensure that the existing infrastructure can absorb the additional production. Failure to do so could mean delays in processing cherries leading to increased waste and decline in quality due to delayed processing. Farmers may also need help transporting increased loads to the washing station.	Private Sector, CNAC, COCOCA, government-management of washing stations

Box 5. Process Upgrading: Driving Yield Increases through the Farmer Field School Approach in Four East African Countries

In 2008, Technoserve launched a four-year $47 million grant program to support the development of 182,000 producers in Ethiopia, Kenya, Tanzania and Rwanda funded by the Bill & Melinda Gates Foundation. Improving production processes was one of the key pillars of the initiative. Prior to the project, producers in the region faced yields approximately one-third below their potential. Coffee-growing knowledge was passed down from generation to generation, with few instances of the incorporation of improved farming techniques; there was limited knowledge of GAPs such as pruning or fertilizer application and negligible use of inputs such as fertilizers or integrated pest management. Poor yields were resulting in reduced quality of life for producers dependent on their coffee income, while others were exiting the industry in favor of other crop production.

Productivity improvements were targeted through a farmer-training program in each country known as the "Farm College" or field school, providing a two-year training and extension services program in sustainable agronomic practices to increase yields. Three key themes guided the training programs (1) developing locally appropriate techniques, (2) incorporating youth and women in the training programs and (3) immediately applicable training and ongoing extension services. These are discussed below.

Locally relevant approach: National soil and leaf analyses surveys as well as a survey of current agronomic practices were carried out in the areas of intervention to fully understand the particular training needs in each community. Significant investments were made in developing high quality training programs for the trainers and in the development and constant updating of the curriculum. Peer trainers were hired from local communities to support local institutionalization of the knowledge transferred. This also reduced transportation and accommodation costs for trainers. Trainers were assigned between 9 to 13 farmer groups of approximately 30 farmers each.

Incorporation of youth and women: As women accounted for an important segment of labor in the plantations in the region, specific focus was placed on targeting women for training, and ensuring that the gender breakdown of the extension agents reflected that of the trainees. 33% of trainees and 40% of trainers were women by the end of the program. In addition, as the program recruited trainers, they specifically targeted children of coffee farming families in the local areas. This provided an important opportunity for off-farm employment, but also provided them with first-hand knowledge of how improved farming techniques can increase yields significantly, and as a result, that coffee production could be a profitable business.

Immediate applicability of training: The training program ran for two-years, the first year with monthly training sessions, and the second year with bi-monthly training. In between training sessions, trainees were monitored by the trainers. Training was principally practical in nature and incorporated the use of demonstration plots and farm visits. Each month's training was aligned with the coffee cycle, so that trainees could return to their plantations and immediately apply the skills learned. Training content included 11 best practices: mulching, weeding, pruning, rejuvenation, erosion control, shade management, composting, nutrition, integrated pest management, safe use of pesticides and record keeping.

Outcomes & Results at the end of Phase 1 (2011)

- ***Trainees & Trainers*:** Over the course of the program, 36,033 smallholder coffee farmers participated in the Farm College, approximately half of these producers were in Rwanda, and a training staff of 130 trainers was established across the four countries. In Kenya, almost one-third of farmer trainers are using their extra income generated on their own coffee plantations as a result of the training to fund further studies, while others are providing contract training services for neighboring cooperatives and farmers.
- ***Adoption of Best Practices***: Overall, 79% of producers adopted six or more of the 11 best practices, although adoption rate varied by country; Rwanda had the highest (91%), followed by Kenya (85%) and Tanzania (53%). Two impact evaluations found a positive correlation between training attendance and the adoption of best practices. Surveys of

farmers in Rwanda noted that the most important skills they acquired from the program for driving yields were composting, mulching and nutrition. Monitoring in Rwanda was shown to have a 7% increase in uptake of best practices and a 12-15% increase in training attendance.

- ***Yield Increases***: At 42%, average yield increases for the trainees was remarkable. There was some variation across country-years with some producers in the 2011 Cohort in Rwanda even increasing yields by over 75%.
- ***Farmer Retention in Coffee Production***: While no quantitative analysis was carried out with regard to number of farmers engaging in coffee, the initiative did note the increase in anecdotal evidence of producers returning to care for their coffee trees after decades of underinvestment or abandonment as coffee once again became an attractive investment (the project also coincided with a dramatic rise in the global price for Arabica coffee).

One key lesson learned through this process was the importance of scaling up projects to attract private sector investments and ensure that programs were driven by market demand. The scale of the project simultaneously allowed program officers to engage in dialogue with the different governments regarding national coffee policy formulation.

Source: (TechnoServe, 2011).

C. Environmental Upgrading Through the Effective Management of Water Systems at Washing Stations

Inefficient use of water, contamination of water sources and use of polluted water in the processing of coffee cherries are all major issues in coffee producing countries (Flores et al., 2013; TechnoServe, 2011), and Burundi is no exception (USAID, 2013). Prior to 2007, no washing stations treated their wastewater in any way before releasing it. By 2013, only 16% of stations had begun to implement treatment systems, while only 25% drew on water from springs or wells. These issues can have important impact on the competitiveness of a country's coffee sector. First, the expulsion of coffee pulp from washing stations into nearby rivers from processing a single ton of parchment generates a biochemical oxygen demand (BOD) comparable to that of the human waste generated by 2,000 people per day, deoxygenating the water and altering its pH (Beyene et al., 2012). This can have serious negative impact on both the health of the surrounding populations as well as the quality of water used to irrigate other crops. Second, traditional washing station technologies such as those used at the majority of washing stations in Burundi, uses between 6,000 and 10,000 liters of water per ton of green coffee (Brando, 2013; Kubota, 2012). In light of anecdotal evidence of changing rain patterns and the increased importance of diversification and development of other agribusiness products, water resources need to be more effectively managed. Finally, the use of polluted water sources for washing coffee, such as drawing on rivers into which untreated effluent is flowing, can result in bacterial and viral contamination of coffee lots, leading to their rejection on the international market due to failure to comply with SPS standards.

Furthermore, the improvement of water management in coffee supply chains is increasingly being discussed as an important factor for market access. A number of certifications, including Rainforest Alliance and Fair Trade, as well as buyer programs such as Starbuck's C.A.F.E. program have begun to incorporate and audit water management practices throughout their supply chain, and it is likely to become an important factor for achieving and maintaining certification in the future (Flores et al., 2013; Ponte, 2002b; Semroc, Baer, Sonenshine, & Canter Weikel, 2012). In addition to certification programs, the incorporation of appropriate water management techniques is also being considered by the Specialty Coffee Association of America (SCAA) as a new requirement for coffee to receive "specialty" certification (Brando, 2013; Flores et al., 2013). The failure to implement better water management practices in Burundi could

thus have important implications in terms of achieving the necessary upgrading into the specialty coffee segment.

Costa Rica has been a pioneer in improving water management in the coffee sector and could serve as a source of lessons for Burundian policy-makers. In 1992, ICAFE, in coordination with the Health Ministry, the Costa Rican Water and Sewer Service, and National Electricity Service, outlined a program to upgrade coffee wet processing by minimizing water utilization. The goals of this program were to conserve the environment, decrease waste and improve the quality of green coffee. By 1996/97, coffee wet processing technologies were upgraded across the country, at a cost of over $100 million (Instituto del Cafe de Costa Rica, n.d.). Residual materials such as the pulp are used as an organic fertilizer, and the parchment is burned to generate energy required for the drying process of the coffee beans (Instituto del Cafe de Costa Rica, n.d.). Such initiatives have not only improved the quality of the beans but have also enhanced Costa Rica's self-promotion as an environmentally sound coffee producer.

Although this problem is pervasive in the coffee sector, there are not yet any established protocols at the regional or global level regarding how to overcome the negative impact of poor water management or establish acceptable levels for contamination (USAID, 2013). Nonetheless, there are emerging good practices in the sector (Flores et al., 2013; TechnoServe, 2011; USAID, 2013). The steps detailed below incorporate these different practices. Environmental upgrading would entail the installation of several new systems at the coffee washing station and the provision of training of the staff competent in the new techniques protocols for avoiding contamination. Training programs are discussed in the recommendations section.

(1) ***Access to Fresh Water***: installation of a well, borehole or filter system for access to fresh, uncontaminated water for the washing process.

(2) ***Reduction of Water Consumption***: the installation of eco-pulping machines such as those being manufactured in Brazil and Colombia can reduce water use by between 80 and 90%.

(3) ***Improved Sanitation***: construction of latrines and hand-washing stations to improve hygiene and sanitation and avoid contamination of fresh water supplies.

(4) ***Separation of pulp:*** coffee pulp should be removed from the wastewater, dried and used for composting.

(5) ***Treatment of Wastewater***: filters can be installed to remove sediments, equilibrate pH and re-oxygenate water before returning it to surface and ground waters. One alternate, low-technology method that is currently being used is the development of Vetiver wetlands (Bottenbuerg, 2013; TechnoServe, 2011).[19]

There is growing awareness among policy makers, donors and actors within the sector in Burundi regarding this challenge and the importance of updating washing station facilities (IMF, 2012). Two key pilot projects are noteworthy: First, USAID BAP ran a pilot program for the installation of improved environmental management in the country between 2007 and 2012. The program provided half of the funding for the installation of eco-pulpers at 18 washing stations, including four new mini-stations and 14 publically and privately owned stations. Six stations installed recycling systems to further reduce the water use by the processing plants. Latrines were also built at these six stations, and classes were carried out to improve hygiene. Positive results were seen in the reduction of noxious odors around the washing station and pulp was used by farmers in the surrounding areas for composting (USAID, 2013). The second project is a new Global

[19] Vetiver is a grass with deep root structures which is used in the treatment of sewage and non-industrial waste. The grass slows the flow of the water, and contaminants are then absorbed by the grass before being released into the broader hydrological system

Environmental Facility funded project in three coffee producing regions; this project will incorporate environmental protocols at both the production and processing stages of the chain. The project aims to bring together a range of stakeholders including ISABU, Intercafe, coffee washing stations, producers and the Ministry of the Water and the Environment. Importantly, the project also plans to finance the establishment of standards and regulations to promote the environmentally sound operation of CWSs and to strengthen the institutional capacity to monitor the implementation of sustainable technologies and the enforcement of regulations and policies (World Bank, 2013).

Expected outcomes

1) **Potential generation of off-farm employment** as trainers in the installation, operation and maintenance of water management systems. Due to the limited number of existing stations with water management (18), there are a large number of washing stations which require both equipment and training in how to operate and maintain them. This would, of course, require the washing stations to have access to finance for the purchase of the equipment. Given that there are only 185 washing stations in the country and that 18 already have eco-pulping machines, the market is perhaps not large enough for a local private sector firm to operate, however, economies of scale could be achieved if Burundi is used as the base for distributing and installing these machines across EAC.
2) **Potential off-farm employment for the manufacture and sale of compost generated from coffee pulp waste**. Effective use of coffee pulp for composting can provide a valuable source of organic fertilizer, which is much needed to reduce import costs and drive productivity across the agribusiness sector. Mulch currently accounts for 90% of coffee input costs (an average of 43% of the cost of production of coffee) due to its scarcity (Integrity, 2013). The USAID BAP pilot saw successful uptake of the use of mulch compost by producers, however, wider training initiatives will be necessary. Similar projects are underway in Ethiopia (see Box 6), and in several Central American countries (Semroc, Baer, Sonenshine, & Canter Weikel, 2012). This has potential additional benefits of supporting process upgrading to improve productivity.
3) **Secure upgrading into and participation in the higher value specialty coffee segment**. This may become a requirement for both specialty and certified coffee in the not too distant future.
4) **Secure water supply for other agricultural crops**. Due to the dependence of the majority of the population on agriculture and ongoing initiatives to drive upgrading in agribusiness chains, the country's water supply needs to be effectively managed. These other chains can provide additional upstream and downstream employment, diversify the export base and generate foreign exchange.
5) **Reduce water use and thus costs at the washing station level**. Eco-pulpers can reduce water use by 80-90% (TechnoServe, 2011); this is particularly important where washing stations do not have their own springs/wells and must pay for their water. Reducing costs at CWSs can greatly improve the competitiveness of Burundian coffee.
6) **Reduce potential health care problems and improve quality of life in the surrounding communities**. As Burundi's health care system remains weak, particularly in rural areas, removing potential sources of infection and disease can have important benefits both from a national budgetary perspective but also with respect to improving quality of life and ensuring workers remain healthy. This was highlighted by producers in communities surrounding CWSs in Ethiopia where wastewater systems were installed (see Box 6).

The achievement of environmental upgrading faces two important constraints: access to finance and lack of knowledge about the benefits of water management improvements. First, CWSs often find themselves unable to purchase and install required equipment due to poor access to finance, high interest rates for available credit and insufficient knowledge among loan officials of the coffee washing process and the potential positive returns from improving the washing stations. Considerations should be made to provide financing to high performing CWSs so that such investments are incentivized. Second, awareness of the need to install water management systems is relatively new to the coffee sector, and there are no established protocols to follow. New equipment is still being developed, and the country lacks ecologists to develop local protocols and training. Initial steps towards environmental upgrading should focus on disseminating awareness of the water management problem in Burundi, in order to ensure against resistance to change. An initial "train the trainer" program that leverages foreign experience will also be required to ensure the effective transfer of new knowledge.

Box 6 highlights some of the practices Ethiopia has adopted to overcome barriers to environmental upgrading.

Box 6. Environmental Upgrading in Washing Stations in Ethiopia

While the adoption of the wet processing method improves the quality of beans, it also puts pressure on the water resources. To meet the water requirements, rivers that Ethiopians depend on for basic needs such as drinking, cooking and cleaning are being directed toward processing coffee. The commonly used method of wet processing produces a considerable amount of wastewater with high levels of organic matter; this waste is discharged into the river system, polluting the water and negatively impacting the natural ecosystem and health of local communities. The environmental and social challenges posed by the new method of processing coffee in Ethiopia have not gone unnoticed. The scientific community has conducted studies to measure the impact of traditional wet processing method on river water quality, the government has passed laws to regulate the industry to be gentler on the environment and NGOs in partnership with multilateral organizations and the private sector have been helping the country upgrade technologies and dispose of waste material properly. These different initiatives are described below:

***Scientific Analysis*:** In 2007, a team of researchers conducted water quality assessment along 18 rivers that receive untreated wastewater from 23 coffee washing stations in the Jimma region (Beyene et al., 2012). The research evaluated the level of oxygen, organic load, total dissolved solids, pH, phosphorous, nitrate, and ammonia between the upstream and downstream and revealed that the discharge of coffee wastes significantly deteriorated the quality of water and impacted the biodiversity in the river (Beyene et al., 2012; Bladyka, 2012; Kebede et al., 2010; Kubota, 2012). These studies drew attention to the need for urgent action in adopting appropriate abatement technologies to implement ecologically sound coffee-processing systems in Ethiopia (Kebede et al., 2010; Kubota, 2012).

***Changes to Government Regulation*:** To address coffee waste**,** the Ethiopian government recently passed legislation to prevent new CWS construction within five kilometers of existing stations (TechnoServe, 2011). Additionally, the regulation requires the creation of systems for the proper disposal of the contaminants in order to receive a permit to begin operations each season. Government officials closely monitor compliance through frequent site visits (Bottenberg, 2013). The laws also require that effluent be contained more than 30 m away from natural waterways (Bottenberg, 2013).

***Rainforest Alliance initiatives*:** With funding from USAID, the Rainforest Alliance worked with three leading coffee cooperatives to ensure the incorporation of more effective environmental management systems. Environmental committees were appointed to ensure proper management of solid and liquid waste from coffee processing and coffee pulps are composted to create fertilizer (Albanese).

TechnoServe, IFC and Brown Gold: As part of the Coffee Initiative, TechnoServe supported 107 CWS, including the installation of 63 new (?)ones (TechnoServe, 2012). To improve compliance with the growing market shift towards improved environmental practices at the CWS level, the organization introduced sustainability practices and installed "eco-pulping" equipment in the new stations, reducing water use by 80% to 90 % compared to traditional wet milling equipment (TechnoServe, 2013). Station staff received training and technical support for two years and annual audits were conducted to identify

areas for improvement and to track compliance. The organization also provided technical assistance to install water meters and logbooks to track water consumption over time to show that water reduction efforts have been made to comply with Starbucks's C.A.F.E. standards and other certification protocols (Semroc, Baer, Sonenshine, & Weikel, 2012; TechnoServe, 2013). Additionally, cooperatives received training to separate the coffee pulp from the wastewater to use it as organic compost, and wastewater disposal systems using shallow evaporation lagoon or a Vetiver wetlands were established (Bottenberg, 2013; Brown Gold; TechnoServe, 2013). Furthermore, Technoserve established relationships with the International Finance Cooperation (IFC) and Nib International Bank, a major commercial Ethiopian Bank, to establish US $10 million facility to fund working capital and capital investment loans (International Finance Corporation; TechnoServe, 2013).

Results: While it is too early to demonstrate the impacts of environmental upgrading in the coffee sector in terms of improved price and quality of coffee, preliminary observations and results are promising. Technoserve observed that the CWSs with the highest sustainability ratings tended to have the lower operating costs (TechnoServe, 2013), and that sustainability measures are positively correlated with economic benefit and price efficiency, measured by farm-gate price and farm share of export price respectively (TechnoServe, 2012). Similarly, water quality measures comparing a Vetiver wetland treatment versus traditional disposal, showed a reduction in negative impacts on water quality from pre-harvest to mid-harvest (Brown Gold, 2013). People living around the washing station have also noticed that unpleasant odors during the harvest and wet –milling seasons have dissipated (Brown Gold).

A. A Pre-Requisite to Upgrading: Institutional Strengthening

The upgrading trajectories described above, however, require that the key local actors collaborate and coordinate. The development of the private sector in the coffee industry would benefit significantly from additional efforts to strengthen institutional capacity of producer organizations, the professional trade association, Intercafe, and the regulatory agency ARFIC. Two key domestic organizations in the coffee industry are the *Confédération Nationale des Associations de Caféiculteurs* (CNAC) and Intercafe.

CNAC represents all of the coffee producers associations and cooperatives in the country in all decision-making bodies and negotiates on their behalf with policymakers, donors and other actors within the chain (UNIDO, 2013). With 3,226 associations as members of the confederation, the organization represents approximately 190,000 producers (CNAC, 2012). With a wide geographic reach covering 14 of the 17 provinces (UNIDO, 2013), the organization has extension officers located in all of the coffee producing regions. The organization also occasionally provides inputs, such as fertilizer for members (Integrity, 2013).

Intercafe is the newly established professional trade association which represents all actors in the coffee GVC in Burundi, from producers to exporters. The goal of the organization is to bring members of the industry together to promote and set standards for the growing, exporting, and processing of coffee from this country. The association has a mandate to provide training to all members of the association as well as to drive marketing initiatives for Burundian coffee abroad, and it attends international trade fairs on the sector's behalf (Baranyizigiye, 2013). The association is also responsible for maintaining an online database platform, www.cafeduburundi.com, which was established together with USAID and ARFIC to reduce information asymmetries for foreign buyers interested in sourcing Burundian coffee. This database includes information such as policies and regulations, major stakeholders, the structure of the industry and key contact information for different washing stations within the country (Cafe du Burundi, 2013a; USAID, 2013). The organization is also responsible for updating and disseminating the price to be paid to producers based on the NYFOB. Operating costs are paid for by compulsory contributions of 0.6% of coffee revenues (UNIDO, 2013).

These institutions are relatively new to the country, and their continued development could help to provide a more solid foundation for the development of the sector. While specific recommendations for workforce development for these proposed upgrading trajectories is

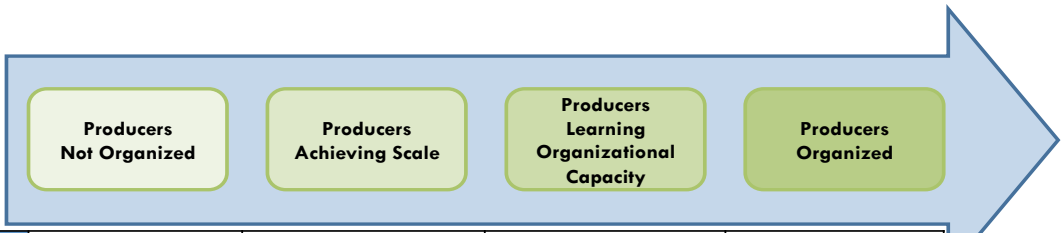
provided in the following section, these transversal issues must be addressed to facilitate ongoing development of the country. This section thus outlines a number of specific recommendations to institutionalize the coffee sector in the country:

Formation and Strengthening of Producer Associations and Cooperatives. As Burundi's agricultural sector is highly fragmented by smallholder land ownership structures, although they represent the largest share of actors within the chain and the potential for the industry is really shaped by their actions, individual producers do not have sufficient leverage to influence the market or policies to improve their participation within the industry; this leaves them vulnerable to abuse from intermediaries and unable to negotiate fair prices. At the same time, this fragmentation adds significantly to transaction costs in the provision of services and training. Only 1/3 of producers currently belong to a producers' group. The formation of producer associations and cooperatives is thus essential for these smallholders to be able to play a more effective role in the industry.

As shown in Figure 9, Burundian coffee producers range from individual producers, to weak farmers groups, through to strong institutions such as COCOCA that have acquired greater capabilities and in turn capture greater social and economic benefits from their participation in the sector. Different levels of support are thus required to develop these institutions.

- Facilitate the formation of producers associations organizing informal meetings among producers in the same locality and explain the benefits of acting together.
- Provide basic training to associations and cooperatives on production, administration, finance and social capital.
- Identify when producers' groups may not be capable of advancing their organization due to limitations such as basic literacy; these producers will need an intermediary to fulfill the gaps. It is important that the good intermediaries are supported, while exploitative ones are sidelined.

Figure 9. Development of Producer Organizations in Burundi, by Existing Capabilities



PRODUCERS ORGANIZATION	Producers not organized as groups. They act individually.	Producers organize only to reach economies of scale for sale.	Producers organized and learning to provide some services to the group and perform new activities	Producers well organized providing several benefits to the group and perform sophisticated activities
INTERMEDIATION	No direct access to buyers. Producers require an intermediary. Some are organized under an outgrower model.	Usually require chain intermediaries to reach the final buyer. May also operate as outgrowers.	Producers begin to buy pass intermediaries and sell directly to final buyers.	Do not require an intermediary and can sell directly to the final buyer.
ADMINISTRATION & MANAGERIAL CAPACITY	NA	Producers are not yet capable of managing administrative tasks.	Producers begin to manage administrative tasks.	Producers can perform administrative tasks
PARTICIPATION IN THE VALUE CHAIN (EXAMPLE)	Producers sell individually to a exporter company that provides technical assistance and credit for inputs.	Grouped producers sell to an intermediary, but with greater bargaining power to obtain better prices.	Producers sell through an intermediary but they are learning to bypass the intermediary to sell directly and capture more value	Producers sell to a foreign buyer directly without the need of an intermediary.

Source: Authors.

Strengthen the internal capacity and accountability of ARFIC. This institution is crucial to the export of coffee due to their central role with respect to export permits; however, it is common to observe delays in obtaining the necessary documents. Time-consuming clearance and inexperienced management are cited by value chain actors as important institutional factors that reduce competitiveness of the country's coffee. Currently, it can take as many as 15 days to complete export documents and the process tends to be irregular and unreliable.

- Organize regular meetings with value chain coffee actors to understand their needs and how the procedures can be improved.
- Procedural training at ARFIC and institutionalization of processes is required to reduce delays.
- The creation of a "one-stop-shop" export process for coffee would be a huge win for the country. ARFIC needs to find a system that streamlines the export procedures through the introduction of a one-stop-shop for exports and a check-list.

Professionalize and improve the Intercafe programs. Intercafe is in charge of marketing and training the coffee sector in the country. The association participates in international trade fairs to showcase Burundi's coffee production such as the American Cup (ACEA), SCAE, African Fine Coffees Association (AFCA), and Seoul International Cafe Show (Cafeshow) and have played a critical role in ensuring continuity of the CoE competition in the country. However, buyers indicate that, to date, there is no consistent or clear branding messaging being promoted by the association and the lack of English language skills limits the promotional teams' abilities to effectively connect with potential buyers (Field Research, 2013). Furthermore, while Intercafe highlight that they have taken on the role of providing training to value chain actors following the completion of the USAID BAP program at the end of 2012, interviewees from the sector did not identify any particular training programs provided by Intercafe. The organization does not appear to have the capacity to provide their mandate activities due to the lack of appropriate human resources (Clay, 2013). Box 7 draws on the experience of Costa Rica to illustrate the potential role that Intercafe can play in helping the country achieve the upgrading initiatives described above.

- Professionalize Intercafe, hiring experienced professionals in the field. If no skills are found within the country, import professionals that can perform adequately and fulfill the institution mandate.
- Create a country-training plan in which gaps and strategies are identified to promote coffee quality and productivity.

Box 7. Institution-building and Upgrading in the Costa Rican Coffee

Costa Rica was the first Central American country to cultivate coffee. With favorable geographic features and fertile, volcanic soil of low acidity, the country has become the fourth largest supplier of specialty coffee in the world, despite its small size and predominantly smallholder production model (Instituto del Café de Costa Rica, n.d.). Instituto del Café de Costa Rica (ICAFE), the country's trade association provides a strong example of institutional establishment to support and regulate the activities of a large number of coffee producers. Like many other Central America countries, Costa Rica has received support from multilateral and bilateral organizations to improve the quality of coffee production and establish links with foreign buyers (Fernandez-Stark & Bamber, 2012b), however, this professional industry association, with support from select additional actors including the government, has played a central role in driving product, process and environmental upgrading.

Established in 1933, ICAFE represents all key industry stakeholders: farmers, processors, roasters and exporters. The organization serves a number of functions, including regulation of coffee production (for example, by permitting the cultivation of only certain varieties of coffee); disseminating information about "best practices" to all stakeholders; and monitoring, registering and verifying marketing channels (Instituto del Café de Costa Rica, n.d.).

Driving Product Upgrading: Following the 2000/1 coffee crisis, ICAFE led the initiative to further improve conditions for cultivation, processing and marketing activities, opting to compete in the international coffee market through improved quality rather than expanding the quantity produced. ICAFE began the practice of retaining the 5% lowest quality coffee beans from each harvest and embarked on a set of initiatives to further differentiate Costa Rican coffee through improvements in the quality of exports (Varangis et al., 2003). Each Costa Rican coffee region signed a Quality Improvement Agreement (QIA) with ICAFE, in which the owners of the processing plants committed to accept only ripe fruits to guarantee quality (Instituto del Café de Costa Rica, n.d.). In 2007, ICAFE hosted the first "CoE", which helped the country to further showcase their quality coffee through internet auctions (Alliance for Coffee Excellence, 2007). Subsequent CoE competitions have since been held in the country. The organization also cooperates closely with The Specialty Coffee Association created in 1993 to promote Costa Rican Coffee in the specialty coffee market (Specialty Coffee Association of Costa Rica). These organizations regularly collaborate on joint initiatives with governmental programs run by the Ministry of Agriculture's extension services. The organization also provides training on export protocols to producers so that they may export directly to consuming countries, without contracting with a third-party exporter.

Leading Environmental Upgrading at the production and processing stages, ICAFE introduced initiatives to upgrade the country's coffee products through quality enhancements and a new focus on environmental and social sustainability. The use of agro chemicals has been minimized in order to conserve the richness of the soil and enhance the quality of green coffee, herbicides with low toxicity levels are selected by ICAFE and applied by farmers to protect coffee trees, and ICAFE helps producers to conduct soil analyses in order to identify the lowest possible level at which fertilizers can be fruitfully applied (Instituto del Café de Costa Rica, n.d.). In 2002, ICAFE also launched a sustainable coffee seal to be awarded to coffee producers that protect plantation ecosystems, save energy, clean up waste-disposal, improve pest and disease control, provide healthy working condition for coffee pickers and reduce the use of chemicals (Institute for Agriculture and Trade policy, 2002; Instituto del Cafe de Costa Rica). These techniques promote environmental upgrading and also allow farmers greater access to specialty coffee chains that may require organic production methods or other environmentally sustainable farming practices. In order to capture the value from these in product and environmental upgrading, ICAFE started to differentiate organic coffee by separately registering the production and sales of organic and conventionally grown coffee in 1996 (Instituto del Café de Costa Rica, n.d.). The ability to separately register and trace organic and conventional coffees is important, as it enables the creation of separate marketing channels for each type of coffee and increased information available to clients. Importantly, ICAFE not only promotes activities within the coffee chain alone; the institute also encourages farmers to diversify their crop base in order to facilitate the realization of broader agricultural development goals and to

reduce the over-dependence of coffee farmers on a single cash crop.

Functional Upgrading: Finally, ICAFE has expanded training efforts beyond the production and processing stages of the chain. In recent years, demand has grown within Costa Rica, among both tourists and middle-class urbanites, for specialty coffee. In order to satisfy this demand, ICAFE has helped to provide training to roasters and baristas in specialty coffee shops. Given the large degree of value-capture enjoyed by roasters and specialty coffee shops (Daviron and Ponte, 2005), this expansion into downstream activities in the coffee value chain represents an important upgrading avenue for Costa Rica.

Supporting producers through price volatility: ICAFE also manages the Liquidation Payment System which operates in the same way as Burundi's Intercafe pricing mechanism, ensuring timely pay outs to producers at prices fixed in reference to the NYFOB price, plus a differential (Instituto del Cafe de Costa Rica), followed by a premium paid based on final sales at the end of the season. There is recognition that this system remains vulnerable to extremely low prices on the global market. The government thus is proactively engaged in protecting producers from price volatility. For example, in 1992, in response to the coffee crisis that followed the collapse of the ICA in 1989, the Costa Rican government created the National Fund for Coffee Stabilization (FONECAFE), which was allowed to accumulate debt up to $50 million to support coffee growers (Varangis et al., 2003). Through the fund, the government compensated farmers when their final price fell below the cost of production by more than 2.5% (Varangis et al., 2003). With the improvement in the coffee market, producers not only repaid the funds back to FONECAFE, but also accumulated an additional $23 million through a 2% fee assessed on the total value of coffee sales (Varangis et al., 2003).

Results: By providing strong leadership with respect to improving quality, ICAFE managed to contribute significantly to upgrading in the country's coffee sector. As a result of these and other related initiatives, the number of producers gradually rose and coffee yields increased. By 2011, yields were approximately 1,000 kg/ha – second only to Brazil (ResponsAbility, 2013). Exports in specialty coffee increased from approximately 30% of production to 80% by 2011, and the country consolidated its position as one of the world's most important producers of premium coffee.

VIII. Skills for Upgrading Burundi's Participation in the Coffee GVC

In addition to making improvements in specific areas such as strengthening institutional capacity and improving access to finance, enhancing the workforce capacity in Burundi is an important precondition for upgrading the coffee sector. This section thus highlights the key new job profiles and improvements to existing job profiles that would be needed to support upgrading initiatives. This is then followed by a brief discussion regarding how to go about building the skills required for each of these job profiles, drawing on the country case studies presented earlier in the paper, existing successful initiatives that have been carried out in the country, as well as additional best practices from other parts of the world.

A. Key Job Profiles Required for Upgrading

A better-prepared and skilled workforce is essential for developing new capabilities, adopting new protocols and ensuring the quality standards needed for upgrading. Achieving the upgrading trajectories described in the previous section will require important changes to both existing job profiles as well as the creation of new positions within the Burundian coffee sector. Table 12 provides detailed information on the full set of job profiles that would be required to implement all three upgrading strategies. The experience and skill level of the workforce in coffee GVCs differs depending on the stage of the value chain. The production stage relies on a large number of less skilled workers with a handful of semi- and highly skilled supervisory and management staff; while, downstream in the value chain, increasing processing and/or performing new and more sophisticated activities specifically with respect to marketing and sales, requires a more skilled labor force.

New positions at each stage of the value chain include:

- *Production*: Grader
- *Wet-Processing*: Quality Manager/Technician, Coffee Cupper and Composting team
- *Dry Milling:* Coffee Cupper
- *Trade*: Marketing Personnel and Q-Graders
- *Commercial Functions*: Financial Personnel
- *Regulation*: Environmental regulators and policy makers.
- The number of both extension agents and transport providers operating in the country will need to be augmented to support both product and process upgrading.

These new job profiles are highlighted in red in the table. While these profiles mostly cover key bottleneck positions within the chain, the total employment from these jobs is expected to be small. For example, each CWS may require no more than two cuppers, for a total of 370 cuppers if every station where to adopt this upgrading strategy. Much larger increases in the number of employees (green font) will be required with respect to the number of extension officers and collection agents to facilitate in the transport of cherries to the washing stations. Other positions (in black font) will need to improve their skills to meet the target productivity and quantity levels.

Table 12. Job Profiles in the Coffee Global Value Chain

Position	Job Description	Formal Education Requirements	Training/ Experience	Skill Level
Production				
Researchers & Agronomist	Conduct research to improve coffee seeds, yield & control pests. Determine mineral composition of soil & fertility management requirements such as use of fertilizers, herbicides and pesticides for optimal quality & productivity.	Bachelor's degree and higher	Experience & Practical Training	
INCREASE Extension Officer	Work with coffee farmers, cooperatives and companies to improve coffee production. Duties may include disseminating technical knowledge on good agricultural practices through training, consultation and developing manuals, providing improved varieties of seeds, fertilizers & pesticides. May also be responsible for ensuring certification processes are met.	Technical Education/ Bachelor's degree	Experience & Practical Training	
Nursery Staff	Plant, cultivate, harvest, transplant coffee seedlings in nursery facilities. Assist Agronomists and or extension officers to monitor ongoing coffee plantation experiments to improve varieties, yield or control pest. Inspect and label plants for data collection and for distribution to coffee farmers.	May require high school diploma	Theoretical & Practical Training	
Coffee Grower	Manually plant coffee trees. Maintain healthy coffee farms by monitoring coffee plant & fruit growth, weeding, mulching, pruning, applying fertilizers, and controlling pests. Additionally conduct shade management, and erosion control. Manually pick coffee fruits when ripe and document production.	No formal education required but literacy and numeracy skills will help	Training and experience	
NEW Quality Controller/ Grader	Ensure that only ripe coffee cherries are selected and grade them according to quality. Label as necessary and ensure coffee beans are washed on timely manner to maintain quality and/or to follow certification requirements. Maintain record of coffee stocks to ensure traceability. These tasks may be performed by coffee growers.	Literacy and numeracy skills	Training and experience	
INCREASE Transporter	Transport coffee from fields to washing stations' collection points during harvest seasons. Deliver coffee safely and in good condition (within less than six hours of harvesting) to maintain quality. Manage logistical delivery paperwork including documentation of coffee type, quantity, and location grown. This task could also be performed by coffee growers.	Literacy and numeracy skills	Experience	
Processing				
Wet Processing				
General Manager	Duties may include managing washing stations, meeting with variety of stakeholders along the value chain. Provide strategic direction and management of washing stations. Manage workflow, and work with different line managers for smooth coordination and logistics of coffee processing at washing stations. Manage budget and troubleshoot any management, logistics and personnel challenges. Must possess good knowledge of the industry and strong organization, management and problem solving skills.	At least Bachelor's degree	Management Skills and Experience	

Production Manager	Oversee procurement and processing of coffee selection from different coffee production zones. Liaise with farmers, quality managers and or traders to identify coffee cherries, meet planned target quantity and maintain buyers' requirements. Attend coffee fairs and conferences to showcase coffee and/or to learn new trends and development in coffee sectors. Must possess working knowledge of English.	Technical education/ certification and higher	Training and experience	
NEW Quality Manager/ Technician	Oversee procurement and washing station operations to ensure that coffee cherries are procured and processed in correct and timely manner. May also be responsible for ensuring certification standards are met, disseminating requirements and running training programs. Occasionally attend coffee conferences and workshops. Working knowledge of English required.	Technical education/ certification and higher	Training and experience	
Warehouse Manager	Manage sorting and storage of coffee before and after processing cherries. Ensure proper storage of cherries and beans to avoid molding and other infections and retain quality of coffee. Label and process paper documents to enable traceability of coffee.	Technical education/ certification	Training and experience	
Machine Operator & Technician	Responsible for operating and maintaining machines in washing stations such as wet mills.	Literacy and numeracy skills; mechanics training helpful	Training and experience	
NEW Waste Management Composting	Responsible for ensuring removal of coffee pulp from waste water and using it for the production of compost for sale to the producers in the area.	Literacy and numeracy skills	Training and experience	
Coffee Collectors	Collect coffee from coffee growers and transporters at coffee collection points or washing stations. Sort coffee by hands and by flotation. Remove cherries with low density that float on the surface before wet processing. Document quality and quantity of coffee cherries, and process necessary paperwork.	Literacy and numeracy skills	Training and experience	
NEW Coffee Cupper/ Evaluator	Coffee evaluators take samples of coffee to evaluate the quality of coffee through inspection and cupping before the coffee cherries from wet mills are processed through dry mills. Based on the sampling, issue an official quality certificate for all contracts. These tasks may also be performed at the washing station stage.	Technical education/ certification and higher	Training and experience	
Equipment Installers/ Maintenance	Responsible for installing new equipment related to improved water management systems. These include pump technicians, as well as technicians trained in installing and maintaining eco-pulping equipment.	Technical education/ certification and higher	Training and experience	
Dry Processing				
Manager	Oversee procurement and processing of coffee selection from different coffee washing stations or zones as well as managing service contracts to process third-party coffee. Liaise with farmers, quality managers and or traders to identify coffee cherries, meet planned target quantity and maintain buyers' requirements. Attend coffee fairs and conferences to showcase coffee and/or to learn new trends and development in coffee sectors. Must possess working knowledge of English.	Technical education/ certification and higher	Training and experience	
NEW Coffee Cupper/ Evaluator	Coffee evaluators take samples of coffee to evaluate the quality of coffee through inspection and cupping before the coffee cherries from wet mills are processed through dry mills. Based on the sampling, issue an official quality certificate for all contracts. These tasks may also be performed at the washing station stage.	Technical education/ certification and higher	Training and experience	
Mechanics/ Technician	Operate and maintain equipment used in the milling processes such as catadors, densometric tables, monochromatic or biochromatic color sorters and UV sorters.	Technical education/ certification and higher	Training and experience	
Graders	Responsible for grading coffee beans according to quality and size. Female laborers are often used at this stage due to their attention to detail and dexterity.	No formal education required literacy and numeracy skills help	Training and experience	
Trading				
NEW Marketing Personnel	Market and sell coffee to traders and other coffee buyers. Provide coffee samples to potential buyers and transmit information to warehouse managers to prepare coffee shipments. Provide inputs or prepare marketing materials. Attend events and conferences to update knowledge on buyers' preferences, new trends and showcase coffee production. Must possess good understanding of coffee varieties, buyers' needs and preferences as well as communication skills & working knowledge of English.	Bachelor's degree in Business Management specializing in Marketing	Training and experience	
Warehouse Manager	Manage coffee storage facilities. Store and stack coffee bags in according to prescribed methods to retain quality and enable traceability. Pack and/or repack coffee bags to meet certification standards and buyers' needs. Verify coffee against receiving and shipping documents.	Technical education/ certification or higher	Training and experience	

NEW Q-Grader	Conduct assessment of coffee through cupping to classify coffee quality and to ensure that they meet quality standards for different markets. Provide feedback on coffee quality to relevant stakeholders such as managers, cooperatives, washing stations and farmers. Must possess good knowledge of coffee quality and end markets' preferences.	Technical education/ Q-grader certification for specialty coffee	Training and experience	
Shipping/ Documentation Personnel	Work with warehouse managers and customs officials by preparing and processing required documentations for coffee shipments. Inspect and take record of coffee deliveries and shipments.	Technical education/ certification or higher	Training and experience	
Truck Operator	Transport coffee from warehouse to ports or collection centers. Deliver coffee safely and timely in good condition. Manage delivery and dispatch paperwork.	Literacy and numeracy skills	Training and experience	
Commercial Functions of Production and Processing				
Cooperative Manager/ Director	Cooperative manager must possess strong organization, management and problem solving skills along with great understanding of coffee. Provide strategic direction, and overall management of cooperatives.	Bachelor's degree or higher	Training and experience	
NEW Cooperative Financial Personnel	Process cooperative sales, loans and payments including salaries of cooperative workers and payment of dividends to producers. Keep clean and up-to date financial record of cooperative transactions.	Bachelor's degree or higher	Training and experience	
Cooperative Audit	Carryout audits of cooperatives' finance management to ensure that the cooperatives have good financial and management practices.	Bachelor's degree or higher	Training and experience	
Key Government Support Functions				
SPS Certifier	Ensure that coffee exports meet SPS requirements for export markets.	Bachelor's degree or higher	Training and Experiece	
NEW Environmental Regulator	Responsible for establishing and enforcing policy on environmental issues related to the production and processing of coffee cherries.	Bachelor's degree or higher	Training and Experiece	
Regulator	Plan, coordinate and implement activities to comply with regulations and standard operating procedures to trade green coffee with domestic and international buyers.	Bachelor's degree or higher	Training and Experiece	

Source: Duke CGGC. Based on analysis of the coffee sectors in the EAC, Ethiopia, early stages of development in Central America.

Skill Level	**Low**	**Low-Medium**	**Medium**	**Medium-High**	**High**
	No formal education; experience	Literacy and numeracy skills; experience	Technical education/ certification	Technical education /undergraduate degree	University degree and higher

B. Required Workforce Development Initiatives for Upgrading

In order to further develop existing job profiles and to successfully create the new job profiles to support these upgrading initiatives, a large number of actions need to be undertaken as part of the country's new National Skills Development Plan for the sector. These range from short-term training and monitoring, certification programs and professional degree programs to hiring foreign expertise. As much of the training is new to the sector, and that teaching curriculum is out of date, this should cover needs assessments, curriculum development, implementation and follow up to identify lessons learned, ascertain which projects are working well within the Burundian context and to iteratively refine the training initiatives on an ongoing basis. The following section provides recommendations regarding how training for the new and improved job profiles should be played out in a way that facilitates each stage of the upgrading process. Where appropriate, these may be highlighted as either short-medium term or medium-long term; the former are to be implemented immediately to achieve results in the short-medium term, whilst the medium-long term initiatives also need to be implemented now but are focused on achieving results in the long term. For example, in order to increase the number of university graduates with improved marketing skills, these skills need to be incorporated into the teaching curriculum today, so that when they graduate in four years' time, they will have this knowledge.

1. Product Upgrading: Specialty Coffee Niche

Key new job profiles required to implement the steps required to achieve upgrading at this level are:

Quality Controller/Grader at production, Quality Manager/Technician and Coffee Cupper at the washing station level, Coffee Cupper at the Dry Mill level, and Marketing Personnel and Q-Graders at the export/trade level.

Updated & targeted needs assessment*:* First, as there are currently very few specialty coffee experts in the country, experts should be brought from abroad to perform gap analyses in terms of coffee production, soil and leaf analyses and agronomic techniques required to produce high quality specialty coffee. These leading experts should engage and train leading coffee experts and agronomists in the country to undertake the required studies across all areas of the country over 1,500 msm that are suitable for producing specialty coffee. These coffee experts could include the staff of Agri Business Services who were lead instructors in the USAID BAP program, experienced CNAC agronomists and leading coffee researchers from ISABU. In the medium to long term, these leading experts should be engaged to teach modules on these key issues within the agronomy curriculum at the University of Burundi, University of Ngozi and ISA to ensure skills taught in the program have practical application in the sector.

Incorporation of good agricultural practices, harvesting techniques and introduction of traceability requirements in key areas of the country: This is an essential aspect to improving coffee quality to access the specialty niche market. As highlighted in Section VI, several small training programs have successfully run these trainings in Burundi, however, these have lacked a systematic approach and have only been able to reach a small number of producers. In order to achieve nation wide impact, this training approach could employ a "cascading model", in which knowledge is transferred step-by-step from experts, to local professors and universities, to extension agents, then to peer trainers drawn from coffee growing areas and finally to producer associations or groups of growers based on location. This model has been very successful in scaling up access to training in Nicaragua and Honduras (see Box 8). At each stage of the training, the ratio of theoretical to practical training should be adapted according to the literacy levels of the audience and appropriate teaching materials and tools should be developed. Each level of training should also include the development of facilitation skills to ensure that the knowledge and information is accurately and effectively transmitted from stage to stage.

Furthermore, this training should take into account all aspects of production, including technical skills, administrative skills and interpersonal skills to allow producers to not only improve the quality of their production, but also to facilitate linkages with other stages of the chain, and to begin to view their coffee operations as a viable business. This will be particularly important for engaging disaffected youth in coffee production. Training modules should include introduction to quality coffee to raise producers awareness of why they should invest time in higher quality production and help them to differentiate quality, production techniques such as propagation, plantation management, soil nutrition, water management and grading, production planning, financial planning and record keeping to facilitate traceability, as well as harvesting, the importance of timely delivery of cherries to washing stations and how to access and understand market price and negotiate with buyers, amongst others. Initial materials for this programming can be leveraged from protocols and training modules developed by the USAID Burundi Agribusiness Program in 2012, while entrepreneurship experts from the Burundi Business Incubator could be engaged to help develop administrative and management skills curricula.

While in the short-medium term, this training could be provided on an ad-hoc basis though the university, it would be more effective if for the medium-long term, the program could be formalized and accredited as a technical diploma or certification program and offered through the technical education institutions in key coffee growing regions. Peer trainers would then be able to

offer the training as a service in their community. This could help to not only generate potential off-farm employment but also to overcome the constraints of the limited number of extension agents in the country.

Targeted needs assessments of washing station practices and corresponding trainings to improve quality levels: Although Burundi is known for its quality washing processes and significant improvements were made under the USAID BAP program, knowledge at this stage of the chain has been primarily focused on commodity coffee and is concentrated in experienced, but aging, washing station staff. In order to incorporate up-to-date techniques required for more efficient production of specialty coffee and to institutionalize the existing knowledge in the country, international specialty coffee experts should be brought from abroad to identify specific needs across the different washing stations in the country and to collaborate with existing staff to develop a training curriculum for technical, administrative and interpersonal skills. The 2012 assessment of washing stations carried out by the USAID BAP program could provide initial information for the development of the curricula. This training program should be rolled out in a similar manner to the cascade model described above; first, training university professors at UoB, UNgozi, and ISA, ISABU researchers and experts from the private sector, then training washing station managers, who in turn would train new, incoming staff. This training program would supplement the existing "on-the-job" training approach currently being employed and would facilitate a more efficient inclusion of new, younger employees on the washing station teams.

The content of training modules should include grading and fermentation techniques to ensure high quality cherries are enhanced rather than negatively impacted by the wet-processing stage, the use of clean water in the processing process to avoid bacterial infections, and certification requirements at the technical level. Administrative skills should cover computer literacy for planning, record keeping and communication with clients, operations and financial planning, and marketing. In addition, communications and negotiation skills modules should be incorporated to ensure effective interactions with potential clients. As with the training programs at the production level, each stage of the training program should incorporate facilitation techniques for effective training, be appropriately adapted between theoretical and practical application and, in the long term, be developed into a formal, accredited certification program for which certified trainers could charge for their services.

Increase the number of qualified cuppers at washing stations and dry mills: In the specialty niche coffee segment, cuppers play an essential role in certifying the quality of the coffee. In the industry today, the Q-grader coffee system established by the Coffee Quality Institute is a well-recognized standard around the world. Indeed, a very small number of participants in Burundi have already participated in CQI training programs. Nonetheless, this number is insufficient. Ideally, if the majority of coffee production in the country was to be upgraded to the specialty niche, most washing stations would require personnel who could determine the quality level of the coffee. With over 180 washing stations and 8 dry mills in the country, the 3 certified Q-graders and handful of star cuppers would not be able to meet the demand. Q-grade certification, much like a sommelier, requires considerable experience. However, not all cuppers need to be trained to the Q-grade level, and there are two earlier "cupping" certifications that can be obtained – star cupper and advanced star cupper. In the short-medium term, CQI could be engaged to provide a range of courses at the different levels. In the medium-long term, support should be provided to qualified Q-graders to become certified Q-grade instructors. This would facilitate future training programs and greatly reduce the cost.

Strengthen existing market linkages and develop new ones: As Burundian coffee was sold via auction as commercial grade coffee prior to 2009, there is limited marketing skill and experience in the country. This indeed is a generalized problem and affects both the coffee GVC and the agribusiness GVC analyzed as part of this study. Due to the skills levels required to engage in these roles and to interact with sophisticated buyers around the world, this is best incorporated

into the formal education system in Burundi at the university level. In the short-medium term, a short diploma focused on understanding the principal marketing tools of the 4Ps, price, place, production and promotion, should be developed. In particular, an initial marketing diploma program could be developed either in the University of Burundi's Faculty of Business Science and Management or the Higher Institute of Commerce, targeted at university graduates working in the coffee and agribusiness sector. This diploma could include a special speaker series to invite international and regional buyers to discuss key marketing issues of entering particular markets, such as specialty coffee buyers from Counter Culture, Intelligentsia or regional supermarket executives such as those from Numquatt and Shoprite. If no local university professors are qualified to develop this training curriculum, this should be done in conjunction with a foreign university or foreign professors should be brought to teach the course while Burundian professors attend diploma programs abroad. Graduates of this program should also attend mid-level programs of the cascade models for both production and washing stations to ensure they have a strong understanding of the processes required to produce specialty coffee. Trainees of these programs should also be provided with English language training to ensure fluid communication with potential clients.

Formal education, however, is not sufficient for these individuals, as much of their success will depend on understanding how key markets work. This is a skill best taught through experience and thus, trainees should also participate in trade missions to key markets, accompanied by an international coffee marketing expert who can not only provide introductions to buyers but can also mentor trainees regarding typical practices, appropriate behavior and successful marketing techniques. In the medium-long term, to obtain accreditation, modules from this diploma should also be required as part of both the agronomy and business management degree programs at all universities offering such programs in Burundi.

Box 8. Scaling Up Training Using a "Cascade Model" for Honey Producers in Nicaragua and Honduras

In 2010, the Inter-American Development Bank funded a program to support the insertion of micro and small rural apiculture producers into the high-value European honey markets. In addition to developing linkages with buyers, a central aspect of the project was to develop and institutionalize a training program covering both quality production and market knowledge, which could be scaled up in the country over time. To do this, the project included a training program following a "cascading" approach, that is, knowledge was first transferred from international experts to university professors, who trained producer leaders who then trained micro and small producers. At each level, participants signed a commitment to transfer their knowledge to students in the strata below them. The details of this approach are described below:

Cascading Training Model: Since knowledge of apiculture was almost nonexistent in Honduras and Nicaragua prior to the project, foreign experts were engaged to develop and teach a first, free diploma program to industry participants. These participants in turn offered programs to peer trainers, and then to producers. Following the first program, peer trainers were able to charge producers for their technical assistance and thus, subsequently diploma participants were required to pay a fee for joining the program.[20] This facilitated the ongoing sustainability of the training initiative.

This model includes several levels:

- In the *first level*, UNAM-LEON University offered a seven-month diploma in apiculture to 35 students in which foreign experts taught six modules (1) Technical capacity/production; (2) Sanitary management; (3) Nutrition; (4) Quality; (5) Processing; and (6) Commercialization. Local university professors observed the course and were incorporated into the teaching staff with the foreign experts for the second program. In the long term, local professors would teach the entire course. The course approach at this level was almost 100% theoretical.

[20] Many students in subsequent programs were then sponsored by institutions: banks, governments, NGOs, etc.

- In the *second level*, peer trainers were trained in 3-4 day programs at the university. Many peer trainers were selected from the cooperatives based either on their technical abilities or their experience and success with the product. In this level 50% of the course content was theoretical and 50% practical.
- Finally, in the *third level*, producers participated in training activities in their territories. 70% of the training was practical.

2. Process Upgrading to Improve Productivity of Commodity Coffee

Key job profiles required to implement the steps required to achieve upgrading at this level are:

Increased number of extension agents, transporters and potentially nursery personnel

Updated needs assessment: Soil fertility and poor management of crops are highlighted across the industry as key productivity constraints; however, reports also show that this varies across the country as different areas have had access to different types of subsidy and training programs over the past few years. Prior to rolling out training programs, an updated assessment of plant production, soil and leaf analyses and use of agronomic techniques across the country is required so that training programs can be appropriately tailored. In the short-medium term, researchers at ISABU, UoB and UNgozi, as well as private sector experts should be brought together to establish a short training program for existing and new agronomist technicians to carry out these assessments around the country. In the medium-long term, an optional course on coffee production, soil needs, plant health and optimal agronomic practices for coffee production should be a requirement of agronomy programs in the country for accreditation.

Incorporation of good agricultural practices: While several programs have been carried out in the coffee sector, none of these have been done in a systematic way as to institutionalize knowledge transfer or to reach a critical mass of producers. Using a similar cascading model to that described in product upgrading, engage with coffee researchers and experts to run training programs for extension agents who in turn should provide training for lead farmers. Soil nutrition including appropriate uses of chemical and organic fertilizer and mulch should be a key component of this training, as recent studies have pinpointed this as one of the key factors in undermining productivity. This training content should also include a module on inter-cropping. Regulations long stipulated that producers could not plant any other products in their coffee plantations, thus they have limited experience in this and would benefit from an introduction into inter-cropping techniques and the products best suited to this. Part of this training should also include on-farm monitoring by peer farmers to ensure producers are accurately using the new techniques.

Transportation capacity: Even commodity coffee reduces in quality if cherries are not processed within a few hours after harvesting. Given that producers currently experience difficulties in transporting their harvest to washing stations due to poor infrastructure, distance from washing stations and lack of mobilization, increased quantities resulting from improved agricultural practices will likely further complicate them. This provides an opportunity for family members or youth in coffee growing areas to offer transportation services to producers to transport the cherries during coffee season. These transporters could then also offer services in transporting new inputs such as fertilizer, or transporting other agricultural products to markets in the off-season. Specific training sessions for these youth could facilitate the establishment of this off-farm operation: raising awareness of the market opportunity (more cherries, more income for farmers, higher potential to pay), innovative transportation methods, such as the use of "coffee bicycles" in Rwanda, and introduction to establishing and managing a micro-enterprise. While BBIN could provide input on the business development and management curriculum, instructors from Intercafé can provide input for a simple presentation on the business opportunities of

transporting coffee. This simple training program can be carried out by a wide range of stakeholders engaged in rural development, such as by the cascade model for GAPs which brings trainers in contact with producers' families, the Jobs for Rural Youth Program being rolled out by IFAD,[21] or through the Youth Employment Agency established in 2009, amongst others.

Establish a tree replacement program: Once producers begin to see their returns from increased supply, they may be interested in continuing to engage in coffee production in the long-term. In this case, it is important for them to begin to replace their aging coffee trees.[22] Three additional modules should be rolled out through a cascade approach: nursery care and propagation techniques, transplanting seedlings into existing plantations and an introduction to establishing and managing a micro-enterprise. One of the key constraints noted for producers not replacing their trees is that they would forfeit income for four-five years as the tree reaches maturity. However, new techniques in Central America have shown favorable results of transplanting seedlings into the shade of existing coffee trees. With the use of GAPs, these seedlings can grow for two or more years before the existing, aging tree must be removed, thus cutting the time with lost income by approximately 50%. Protocols and course materials developed by the USAID BAP program, together with other agencies materials and updated information from coffee researchers could be leveraged for the technical aspects of the program while BBIN can be leveraged to provide a short curriculum on establishing and managing a micro-enterprise. This program could be directed towards young graduating agronomists or youth with demonstrated knowledge of coffee production who have attended the GAP training programs carried out through the cascade model.

Box 9. Lessons Learned for Improving Impact of Smallholder Coffee Training Interventions

- Curriculum for training should cover all three key skills areas (technical, administrative and interpersonal skills) not just in production. When producers are treated and trained as "economic agents", they begin to see their farms as a business that requires planning, management and that can yield profits rather than a means for subsistence crops. This is vital for engaging youth in the sector.
- Prioritizing the formation of cooperatives can reduce transaction costs, however this takes time and producers may not be in a position to self-organize. The formation of farmers groups through farmer field schools (FFS) of 25-30 producers can help to reduce transaction costs and provide a basis for future cooperatives.[23]
- Demonstration plots, field visits and practical training that coincide with relevant stages of the coffee season have been found to be successful techniques in training small producers with low literacy rates in other EAC countries.
- Training should follow the production cycle of coffee and should be combined with farm monitoring visits between training sessions. Producers immediately apply learned techniques and receive feedback on whether or not they are using them correctly. This has also been found to increase training attendance and drive further yield improvements.
- Hire and train extension agents and peer farmers from the regions in which the program is operating. They are often better positioned to obtain the trust of surrounding communities and

[21] See Box 6 in companion paper, "Burundi in the Agribusiness Global Value Chain: Skills for Private Sector Development."

[22] Lessons from earlier World Bank projects in the 1980s and the 1990s which focused primarily on the replacement of trees and the construction of washing stations could provide potential lessons learned for this replacement program.

[23] For a discussion on the increased use of farm schools in the EAC, see Box 12, in companion paper, "Burundi in the Agribusiness Global Value Chain: Skills for Private Sector Development."

quickly coordinate producers into farmers groups. This could provide an opportunity for off-farm employment for children of coffee producers.

- Invite all family members to attend training sessions, particularly women and children. Engage youth in administration and interpersonal training operations in particular to encourage them to see coffee production as a business rather than a farm.

Source: (Fernandez-Stark & Bamber, 2012a; GIZ, 2013; TechnoServe, 2011; USAID, 2013)

3. Environmental Upgrading

Key new job profiles: Wastewater manager/composter, Equipment Installers and Environmental Regulators & Enforcement Officers

Given that there are fewer washing stations than producers, scale in training programs for upgrading is less problematic.

Get buy-in from the management level for investment in new systems: As noted earlier, environmental awareness of the impact of the coffee sector is relatively poor in the country and thus the first stage in ensuring washing stations adopt these techniques is by providing training for the washing station owners and/or managers. These training programs should cover three key components: First, building the business case for the incorporation of environmental management systems. Due to the short-term investment costs associated with this upgrading, it is essential to demonstrate for owners and managers how this might affect the washing stations' bottom line. Second, providing an overview of the different technologies available and the costs and benefits of each. There are a number of technologies that can be used that range in cost and level of sophistication, which must be taken into consideration by washing station managers. Third, strengthening of financial and operational planning. Given that this upgrading requires upfront investments, washing station managers, particularly those that are not owned by large MNCs, may need additional training on loan applications and managing human resources for the implementation of the new systems.

In the short-medium term, international experts from organizations such as Technoserve, together with regional practitioners from Ethiopia, university professors, and local washing station operators who have implemented water management systems should be brought together to develop an appropriate, short training curriculum for the integration of these systems in Burundi. These training programs can be delivered either by the Faculty of Agronomy at UoB, ISA, or UNgozi and/or private sector trainers. In the medium-long term, modules from this training program should be incorporated into the agronomy curriculum at the university level and should be required for accreditation. In addition to washing station managers, both representatives from the Ministry of Water and the Environment and loan officers should be invited to attend these training programs. This should help to ensure that regulators understand the complexities and costs involved in installing these new systems and establish appropriately achievable standards, while at the same time ensuring that loan officers understand the medium- to long-term financial pay-offs of these investments.

Improve access to fresh water for coffee washing: Due to the importance of ensuring that there is no bacterial infection passed onto the coffee during the washing stage of the value chain, it is essential for stations to either filter and treat river water prior to use or to source water from a well, borehole or natural spring. The use of wells or boreholes in rural Burundi, however, is relatively new and they are not yet widely used in the agribusiness sector at all. This offers an important business opportunity for young entrepreneurs in rural areas, but training is required to ensure well construction is effective, cost-efficient and safe. Workforce development programs thus need to include both construction skills, such as masonry, identifying optimal locations and

managing risks (e.g. well collapse and objects/ people falling in), as well as administrative or management skills to effectively start and manage their businesses. As noted in Section VI, these skills already exist within Burundi's workforce development field and existing institutions can be leveraged to provide the training. For example, training programs in construction can be provided by technical training institutions at the provincial level, while business development skills training can be provided by BBIN.

In addition to constructing the wells, support needs to be provided for the entry and/or expansion of a pump provider in the country[24] and training needs to be provided for the installation and operation of pumps. As some 6,000-10,000 L are required for the processing of one ton of green coffee, water cannot be raised by hand and washing stations must include mechanical or electrical pumps. These will require installation and maintenance by a trained and, ideally, certified technician. Certified technicians should hold a minimum of an A2 or A3 technical diploma from the national technical education institutions and private sector firms engaged to sell these pumps in the country should be leveraged to provide direct training to individuals.

Improved sanitation management: To complement better access to fresh water sources for coffee washing, latrines and hand-washing stations must be built and workers at the washing station trained in personal hygiene measures. These measures can draw on existing workforce development initiatives at the technical and vocational school level in masonry and plumbing, while health care personnel can be leveraged to develop a short awareness-building workshop which can be held at washing stations around the country.

Reduction of water consumption with the installation of eco-pulping machines: If Burundian firms can establish themselves as the leading distributors, installers and maintenance providers of eco-pulping machines in the region, there is considerable potential demand for training in the use of these machines. On the other hand, if they are only providing installation and maintenance domestically, the market for training will be much more limited. As a result, a measured approach to training for these machines is proposed. This should include first, selecting and organizing for a small number of technical education graduates to attend training sessions run by private firms selling these machines. Leading providers of these machines are currently from Brazil or Colombia. Second, organizing and financing several apprenticeships for these individuals in firms and NGOs operating and/or installing these machines in the 18 WS in Burundi which installed this equipment through the USAID BAP program or in Ethiopia. Following the Technoserve programs, there are at least 63 washing stations operating in Ethiopia using these machines. This hands-on experience will be invaluable for beginning to provide these services in the country and to train day-to-day machine operators at the washing stations on how to use the equipment. In addition, these individuals will require administrative and/or business management skills to operate their small service businesses. These individuals should be required to commit to providing apprenticeship programs within their own businesses in the medium-long term in order to scale out training.

Separation of coffee pulp from wastewater and use of pulp for composting: The separation of coffee pulp from wastewater is a key step to reducing contamination, while at the same time providing a virtually free input for the creation of organic compost. Despite this, only the 6 stations provided training by USAID BAP have incorporated these processes into washing station operations. This operation can either be undertaken by the same washing station as an additional source of income or outsourced as a service to a third-party operation. Either alternative requires technical training in the removal of the pulp, and its use in the creation of organic compost, while a third party service provider option would also require business management skills to develop a viable business model and pricing structure for sale of the compost to farmers in the surrounding

[24] This can be coordinated through the upgrading strategy in the agribusiness GVC recommendations to install micro-irrigation techniques.

areas. In the short-medium, local agronomists and engineers can be brought together to establish the technical training program, while the BBIN can provide business administration planning.

Treatment of wastewater: Not only does the pulp have to be separated, but the water has to be reoxygenized and high levels of nitrogen and other contaminants removed. The most cost-effective, low-tech method of doing this identified to-date which is appropriate for the Burundian context is the development of Vetiver wetlands, however, these systems are still undergoing constant improvement. Institutionalization of this training is thus recommended in connection with researchers in the sector at both the university level and ISABU. In the short-medium term, international experts together with practitioners from Ethiopia should be brought together with local researchers for a workshop at a Vetiver site in Ethiopia to develop a short training curriculum for the establishment and use of these wetlands. This training program should then be offered to employees of the washing stations. In the medium-long term, lessons from the Burundian experience, as well as the incorporation of training on new technologies can be incorporated into the training agenda.

Capacity building at the Ministry level: The participation of ministerial level personnel in workshops discussing the importance of introducing these measures, together with a review of existing technologies, and the costs and benefits of each is essential to ensure that they develop appropriate regulations which can be feasibly met by washing stations. In some cases, standards that are too rigorous are beyond the financial and technical capabilities of the industry, resulting in ineffective application and enforcement. In Burundi, the constraints of rural infrastructure, coupled with the concentration of ministerial resources in Bujumbura, will make enforcement of these regulations even more challenging. Thus, if regulations appear to be too difficult or expensive to comply with washing stations may simply ignore them. It is thus recommended that ministerial personnel be engaged in several of the workshops discussed above, as well as arranging field visits to sites with existing eco-pulping and wastewater management systems in Burundi and a workshop on best practices with Ministerial units in charge of regulation setting and enforcement in Ethiopia. These training workshops should also be coordinated with the new GEF Sustainable Coffee Landscape project currently underway.

C. Engaging Stakeholders in Skills Development for Upgrading

Lessons from others developing countries engaged in GVCs show that a range of new actors including private firms, industry associations, NGOs and international agencies have begun to participate more actively in workforce development alongside more traditional WFD actors in response to rapidly changing conditions in the competitive environment and weak relative potential for local institutions to rapidly adapt to the needs of the global market (Gereffi et al., 2011). In Burundi, as discussed throughout the paper, the private sector is still underdeveloped, the industry association, Intercafe, is in its infancy, NGOs and international agency initiatives have largely been disperse and lack scale, while the formal education system has been disconnected from labor market by years of conflict and weakened government institutions. As the country seeks to increase its competitiveness in the coffee sector, the New Skills Development Plan will play central role to align these various stakeholders and strategic activities to effectively and efficiently maximize on scarce resources.

The Government of Burundi, together with its development partners and Intercafe, should play a strong leadership role in the development and implementation of this plan to support upgrading in the coffee sector – especially if they continue to control a considerable portion of the industry. However, while it has traditionally led workforce development initiatives through formal education institutions, the government lacks the necessary resources and capabilities to deliver the comprehensive workforce development strategies described in the previous section. At the same time, the lack of coordination of these various actors in these efforts as described in Section VI, suggests that strong leadership is required in order to achieve the scale required to

successfully roll out programs in the country. A **coffee specific task force** within the Sector Working Group on Agriculture, led by MINAGRIE, but strongly supported and guided by development partners and Intercafe, would be the best positioned group to provide this leadership. In particular, due to the weak financial position and technical expertise of MINAGRIE and as yet limited financial resources of Intercafe, development partners will need to provide continued financial and technical support to implement these programs. Below, we list the major roles that each of these different value chain stakeholders can play within this coordinated context.

The Ministries of Education and Labor together with the task force must develop a labor market information system to ensure supply of skills in the market meets those demanded by the industry. These actors must gather and disseminate important labor market information that can help to drive upgrading by matching demand and supply for different job profiles. This includes publishing timely information regarding key job profiles required for the industry upgrading, the qualifications required for those job profiles, and salary information for high and low demand positions. Particular attention should be paid to the lower skilled job profiles which require a large number of workers and exhibit the highest demand. Collecting this information, and effectively disseminating it amongst decision makers and technical education institutions in coffee growing regions can help both prospective employees and the existing workforce to make better decisions about their careers and ultimately, improve labor market efficiency. Important efforts will need to be made in this respect as current data collection skills are considered by interviewees as very weak.

The government should be a key facilitator for linking educational institutions, research organizations and the private sector to develop and institutionalize training and education programs. Specific formal education requirements are needed for the development of technicians, agronomists, and marketing professionals to support the industry, while training initiatives are required for specialization of the non-professional labor force. However, educational and research institutions are disconnected from the needs of the private sector. The government thus needs to create opportunities for these different actors to come together. The taskforce should establish a forum to work directly with educational institutions, the Education Ministries, and research organizations to facilitate the development and implementation of the different training programs, including identifying and engaging international experts and policy makers where new knowledge must be transferred to the country.[25] Private sector needs can be channeled through the strengthened industry associations, Intercafe and CNAC. These organizations in the future can be leveraged to update the industry job profiles and their required competencies, creating internal training programs, and partner with educational institutions to customize training and modify existing curricula for current and potential workers.

Tax incentives should be established to encourage private firms to invest in the skills development of the workforce. Private firms, particularly those with extensive experience in the coffee industry should be incentivized to provide their workers with sector specific training. Well-designed financial incentives for in-house training may help to encourage these investments. Incentives should also be provided to employees from the private sector to teach in sector wide programs and for the companies to work in concert with both educational and research institutions. Leading foreign firms, for example, such as Olam and Sucafina can thus be engaged to play an important role in supporting training on market access and quality requirements. Firms should also be encouraged to coordinate and strategize about the industry skills gaps and to invest in training their workers.

[25] This approach has been followed by leading specialty coffee producers Costa Rica and Guatemala, and other Central American coffee growing countries over the past two decades.

Finally, the Ministries of Education together with the task force must establish an accreditation mechanism to ensure quality in the provision of skills training. As a regulator, the government has several roles to support these WFD initiatives to drive upgrading. First, via the Ministry of Higher Education, the government should establish appropriate regulations through the new accreditation system to institutionalize training programs in the medium-long term. This is particularly important given the increase in the number of privately owned universities in the country. Second, it should incentivize ARFIC employees or potential employees to seek CQI certification as Q-graders by requiring the certification for specific quality control positions within the organization. As the organization responsible for regulating the quality of coffee exports, this can ensure global standards for specialty coffee are met.

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X. Appendix

Table 13: Leading Importers of Green Coffee, 2007-2011

Country	Imports (US$ Billions)			% World Market			Growth 2007-2011	Avg. unit value 2011 ($/kg)
	2007	2009	2011	2007	2009	2011		
USA	3.03	3.18	6.51	23.1%	22.1%	24.4%	115.2%	5.10
Germany	2.36	2.55	4.53	18.0%	17.7%	17.0%	91.9%	3.97
Japan	1.00	1.08	1.95	7.6%	7.5%	7.3%	95.6%	4.70
Italy	0.98	1.08	1.73	7.5%	7.5%	6.5%	76.2%	3.71
Belgium	0.45	0.81	1.40	3.5%	5.6%	5.2%	207.0%	4.64
France	0.56	0.61	1.06	4.2%	4.2%	4.0%	91.2%	4.40
Spain	0.52	0.52	0.90	4.0%	3.6%	3.4%	73.0%	3.73
Canada	0.33	0.37	0.80	2.5%	2.5%	3.0%	140.0%	5.54
Sweden	0.29	0.31	0.60	2.2%	2.2%	2.2%	105.3%	5.82
Switzerland	0.25	0.32	0.71	1.9%	2.2%	2.7%	185.8%	4.50
WORLD	**13.11***	**14.44***	**26.67***	**100.0%**	**100.0%**	**100.0%**	**103.5%**	

* Figures for total world imports include double-counting of re-exports.

Source: UN Comtrade, 2013: HS 090111

Table 14: Leading Importers, Roasted and Instant Coffee (including decaffeinated), 2007-2011

Country	Imports (US$ Billions)			% World Market			Growth 2007-2011	Avg. unit value 2011 ($/kg)
	2007	2009	2011	2007	2009	2011		
USA	0.62	0.69	1.33	14.1%	12.5%	14.7%	113.7%	5.10
France	0.58	0.83	1.30	13.0%	15.1%	14.4%	125.5%	3.97
Germany	0.37	0.31	0.74	8.3%	5.6%	8.2%	102.3%	4.70
Canada	0.35	0.42	0.68	7.9%	7.6%	7.5%	93.7%	3.71
Netherlands	0.20	0.31	0.52	4.6%	5.7%	5.7%	155.2%	4.64
Austria	0.23	0.29	0.40	5.1%	5.2%	4.4%	75.3%	4.40
United Kingdom	0.21	0.27	0.32	4.8%	5.0%	3.5%	51.0%	3.73
Belgium	0.16	0.18	0.27	3.6%	3.3%	2.9%	66.8%	5.54
Italy	0.11	0.15	0.25	2.5%	2.7%	2.7%	117.9%	5.82
Poland	0.09	0.14	0.20	2.0%	2.5%	2.3%	125.4%	4.50
WORLD	**4.43**	**5.49**	**9.04**	**100.0%**	**100.0%**	**100.0%**	**104.0%**	

Source: UN Comtrade, 2013: HS 090112 090121 090122

Table 15: Leading Exporters of Green Coffee, 2007-2011

Country	Exports (US$ Billions)			% World Market			Growth 2007-2011	Avg. unit value 2011 ($/kg)
	2007	2009	2011	2007	2009	2011		
Brazil	3.38	3.76	8.00	27.9%	29.6%	33.4%	136.8%	4.47
Viet Nam	1.91	1.71	2.74	15.8%	13.5%	11.4%	43.0%	2.19
Colombia	1.71	1.54	2.61	14.1%	12.1%	10.9%	52.1%	6.05
Peru	0.43	0.58	1.58	3.5%	4.6%	6.6%	270.2%	5.38
Guatemala	0.58	0.58	1.06	4.8%	4.6%	4.4%	84.1%	4.06
Indonesia	N/A	N/A	1.03	N/A	N/A	4.3%	N/A	2.99
Belgium	0.24	0.59	0.94	2.0%	4.6%	3.9%	295.7%	4.60
Ethiopia	0.41	0.37	0.85	3.4%	2.9%	3.5%	104.9%	5.32
Germany	0.39	0.44	0.82	3.2%	3.5%	3.4%	108.8%	4.19
India	0.29	0.26	0.68	2.4%	2.0%	2.8%	131.4%	2.93
WORLD	**12.12**	**12.70**	**23.95**	**100.0%**	**100.0%**	**100.0%**	**97.5%**	

Source: UN Comtrade, 2013: HS 090111.

Table 16: Leading Exporters, Roasted and Instant Coffee (including decaffeinated), 2007-2011

Country	Exports (US$ Billions)			% World Market			Growth 2007-2011	Avg. unit value 2011 ($/kg)
	2007	2009	2011	2007	2009	2011		
USA	0.62	0.69	1.33	14.1%	12.5%	14.7%	113.7%	5.10
France	0.58	0.83	1.30	13.0%	15.1%	14.4%	125.5%	3.97
Germany	0.37	0.31	0.74	8.3%	5.6%	8.2%	102.3%	4.70
Canada	0.35	0.42	0.68	7.9%	7.6%	7.5%	93.7%	3.71
Netherlands	0.20	0.31	0.52	4.6%	5.7%	5.7%	155.2%	4.64
Austria	0.23	0.29	0.40	5.1%	5.2%	4.4%	75.3%	4.40
United Kingdom	0.21	0.27	0.32	4.8%	5.0%	3.5%	51.0%	3.73
Belgium	0.16	0.18	0.27	3.6%	3.3%	2.9%	66.8%	5.54
Italy	0.11	0.15	0.25	2.5%	2.7%	2.7%	117.9%	5.82
Poland	0.09	0.14	0.20	2.0%	2.5%	2.3%	125.4%	4.50
WORLD	**4.43**	**5.49**	**9.04**	**100.0%**	**100.0%**	**100.0%**	**104.0%**	

Source: UN Comtrade, 2013: HS 090112 090121 090122.

Table 17: Lead Firms, by Share of Coffee Market, 2010

Company	*Headquarters*	*Million bags*	*Market share**
Leading Roasters (excluding instant coffee)			
Kraft	United States	13.5	13.5%
Nestlé	Switzerland	12.8	12.8%
Sara Lee** (Hills Brothers)	United States	8.5	8.5%
J.M. Smucker (Folgers)	United States	5.5	5.5%
Elite (Strauss and Elite)	Israel	3.5	3.5%
Tchibo	Germany	2.8	2.8%
Starbucks	United States	2.7	2.7%
Lavazza	Italy	2.4	2.4%
Melitta	Germany	2.0	2.0%
Segafredo Zanetti	Italy	1.9	1.9%
Others		44.4	44.4%
Leading Traders			
Neumann Gruppe	Germany	13.5	13.6%
Ecom	Switzerland	10	10.1%
Olam	Singapore	8	8%
Volcafe (ED&F Man Holdings)	United Kingdom	7	7%
Louis Dreyfus	France	6.5	6.5%
Noble	United States	5	5%
Sucafina	Switzerland	4	4%
Armajaro	United Kingdom	3.5	3.5%
Mercon	United States	2.5	2.5%
Others		39.4	39.6%

Source: ITC, 2011; company webpages

Note: *Based on world roast coffee consumption of 100 million bags and gross world green coffee imports of 99.4 million bags (ITC, 2011)
**Sara Lee declared bankruptcy in 2012 and sold its coffee roasting operations to D.E Master Blenders1753 NV, a Dutch trading and food processing company. D.E Master Blenders1753 NV was sold in 2013 to the German investment group Joh A Benckisar.

Table 18. Top Exporting Firms/Traders in EAC Countries

Burundi [a]	Kenya [b]	Rwanda [c]	Uganda [d]	Tanzania [e]
Louis Dreyfus Commodities Ltd	C Dorman Ltd (Vlocafe ED &F Man)	Rwancof	Kyagalanyi (Volcafe/ED &F Man)	Dorman
C&A Business	Taylor Winch Ltd (Vlocafe ED &F Man)	CBC	Ugacof (Socafinaf)	Taylor Winch
Hacofco	Louis Dreyfus Commodities Ltd	Agrocoffe	Kawacom (Ecom Trading)	Mazao (Nuemann Gruppe)
Tai	Diamond Coffee Co. Ltd	Enas	Great Lakes	Louis Dreyfus
Becabu	Sangana Commodities (K) Ltd (Ecom Trading)	K.A.C.C	Savennah	Olam
Sonicoff	Ibero (K) Ltd (Nuemann Gruppe)	Sopecaf	KDS Coffee Ltd	Karagwe Estate
Bucafe (Sucafina)	Sondhi Trading Co. Ltd	Rwandex (Sucafina)	Olam (U) Ltd	KPL
Altimo	Merali Dewji& Sons	Kiunu	Ibero (Nuemann Gruppe)	KCU
CBC	Rashid Moledina & Co. Msa Ltd	Coopac	Lakeland	Mawenzi Coffee
WEBCOR Sa Geneva	Servicoff Limited	Gatare Coffee	Job Coffee	Sheriff Dewji

Source: (USAID, 2010a, 2010c, 2010e, 2010f, 2010g)

Table 19. Presence of Lead Firms in the East African Community

Company	***Headquarters***	***Presence in EAC***
Neumann Gruppe	Germany	Burundi, Kenya, Tanzania & Uganda
Ecom	Switzerland	Kenya & Uganda
Olam	Singapore	Burundi, Tanzania & Uganda
Volcafe (ED&F Man Holdings)	United Kingdom	Kenya, Tanzania & Uganda
Louis Dreyfus	France	Burundi, Uganda, Kenya & Tanzania
Noble	United States	
Sucafina	Switzerland	Burundi, Rwanda, Tanzania & Uganda
Armajaro	United Kingdom	Kenya, Tanzania & Uganda

Source: Company Websites, 2013.

Table 20. Different Market Systems in the EAC Region

Country	Auction	Direct Sale
Burundi	A sale committee called "Comite de Commercialisation" represented by different stakeholders including ARFIC oversee the quality of coffee to be sold at auction. All the exports used to be sold through auctions, but with the ongoing reforms, the auction is held irregularly and moving towards contracts and direct sales. [f]	Direct sales of coffee require a licensed exporter and must qualify as specialty. Then, the exporters can directly engage with buyers to negotiate coffee purchases.[f]
Kenya	Coffee Auctions are held every Tuesday at the Nairobi Coffee Exchange which is under the supervision of Kenyan Coffee Producers and Traders Association. The marketing agents make all the arrangements such as preparation of coffee samples to carryout auction.[g]	Direct sales are often referred "Second Window." Marketing Agents are allowed to engage in direct sales, but the sale contract with buyers must be registered with CBK. The Board ratifies the contract after inspecting and analyzing coffee for quality and value as per the contract(Embassy of the Republic of Kenya in Japan).
Rwanda	Government is less directly involved in the coffee sector. However, the government helps to set a weekly reference price[h]. Private traders/exports handle exporting coffees.	No additional requirement to conduct direct sales.
Uganda	No auction is held. However, exporters need to register their exports with the UCDA.	No additional requirement to conduct direct sales.
United Republic of Tanzania	Government supervised auction is held every Thursday during the coffee harvesting period.[i]	Direct sales allowed only if requirements imposed by TCB is satisfied and can prove higher price.

Source: [f] (Cafe du Burundi; World Bank, 2011), [g] (Embassy of the Republic of Kenya in Japan), [h] (USAID, 2010e), [i] (Promar Consulting, 2011).

Table 21: Burundi's Public and Private Education Institutions Providing Workforce Training in Coffee/Agribusiness GVCs

Level/Type	Organization	Programs	Degree/ Certificate	Number of Graduates (Total Students), 2012	Location
Public University	University of Burundi, Faculty of Agronomy and Bioengineering (FABI)*	Agronomy Agro-food Industries Technology	Undergraduate	131 (1,003)	Bujumbura
Public University	University of Burundi, Higher Institute of Commerce	Management and Commerce	Undergraduate	89 (839)	Bujumbura
Private University	University of Ngozi	Agronomy	Undergraduate	3 (105)	Ngozi
Private University	*Insitut Superieur de Developpement*	Entrepreneurship and Project Management	Undergraduate	0 (50)	Bujumbura
Private University	*Universite des Collines*	Business Administration	Undergraduate	0 (14)	Bujumbura
Private University	*Universite du Lac Tanganyika*	Management and Applied Economics	Undergraduate	0 (483)	Bujumbura
Private University	International Leadership University - Burundi	Organizational Leadership	Undergraduate	0 (108)	Bujumbura
Public Technical	(*Institut Technique Agricole du Burundi(ITAB*) Kirika	Agriculture	A2 Diploma	51	Mwaro
	ITAB Kigozi	Veterinary, Agro-food Industries Technology	A2 Diploma	89	Kirundo
	ITAB Karusi	Agriculture, Veterinary, Agro-food	A2 Diploma	112	Karusi

		Industries Technology, and Water & Forestry			
	ITAB Kigamba	Agriculture, and Water & Forestry	A2 Diploma	52	Cankuzo
	ITAB Gifuruzi	Agriculture, Agro-food Industries Technology, and Water & Forestry	A2 Diploma	56	Makamba
	ITAB Mahwa	Agriculture	A2 Diploma	32	Gitega
	ITAB Gihanga	Agriculture, and Water & Forestry	A2 Diploma	45	Bubanza
Level/Type	**Program**	# of Schools	**Location**		
Public Vocational	Agro-pastoral	1	Bujumbura		

(MEBSEMFPA, 2012 ; MESRS, 2013; Universite du Burundi, 2013)

Table 22. Interviews

	Company/Organization	Name	Date
1.	Ministry of Higher Education	Gaspard Banyakimbona	31/08/2013
2.	INTERCAFE	Oscar Baranyizigiye	29/08/2013
3.	World Bank	Ferdinand Bararunzuza	4/09/2013
4.	ARFIC	Marieus Bucumi	1/29/2014
5.	Chamber of Agribusiness	Francois Butoke	27/08/2013
6.	Long Miles Coffee	Ben Carlson	30/08/2013
7.	MSU	Dr. Dan Clay	23/08/2013
8.	University of Burundi / ISA	Dr. Steve De Cliff	30/08/2013
9.	UNICEF	Celine Demagny	29/08/2013
10.	BTC AFPT Program	Luc Demeester	30/08/2013
11.	APEFE	Kimba Dodo, Prosper Kiyayila and staff	1/30/2014
12.	University of Burundi Planification et Statistique	Frederic Gahungu	1/28/2014
13.	National Commission of Higher Education	Sylvie Hatungimana	1/30/2014
14.	Agri Business Services	Emile Kamwenubuza & Tharcisse Niyungeko	29/08/2013
15.	RUZIZI	Serge Kasubutare	2/09/2013
16.	PAOISA / MINAGRIE	Francois Lutherau	1/31/2014
17.	Farmers and co	Adijah Makangira	6/09/2013
18.	Ministry EAC	Immaculee Mpeberane & Hilary Ntakiyica	29/08/2013
19.	Ministry of Agriculture	Ndabemeye	1/29/2014
20.	Ministry of Basic Education	Reema Ndayishimiye and technical staff	1/28/2014
21.	COCOCA	Ernest Ndumuraro	3/09/2013
22.	Chamber of Commerce	Christian Nkengurutse	29/08/2013
23.	AFAB	Immaculee Nsengiyumva	6/09/2013
24.	Ministry of Basic and Secondary Education and Vocational Training	Pascal Nshimirimana Ndayishimiye Neema	2/09/2013
25.	National Bureau of Standards	Gervais Nzinahora	1/30/2014
26.	One Acre Fund	Andre Phillip	30/08/2013
27.	AFCA	Lionel E. De Roland-Phillips	7/09/2013
28.	CAPAD	Annick Sezibera and Jean Marie Ndayishimiye	26/08/2013
29.	Sucafina	Alistair Sequeria	6/09/2013

30.	USAID/BOAM/Intercafe	Adrien Sibomana	27/08/2013
31.	University of Burundi – Ministry Campus	Nyandwi Venant	1/30/2014
32.	Trademark East Africa	Anthe Vrijlandt	2/09/2013
33.	WEBCOR	Olivier Wege	28/08/2013
34.	CAPAD Agricultural Expo		31/08/2013
35.	Launch Event for AFCA Conference		6/09/2013