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Coffee Value Chains in India: Exploring Sustainability Oriented Markets

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Abstract:

Indian coffee sector is at an important point of transition, wedged between quality and value segments of the market. The trend towards Robusta has reduced the share of Arabica coffee resulting in moving away from the quality segment of the market. The value chain analysis of conventional, certified, and organic coffee indicated that chains for coffee are largely diffuse in nature, with limited coordination in terms of quality and specifications in the conventional chain. Coordination is stronger in certified and organic chains, but incentives and motivation for upgrading largely stem from individual efforts to add value rather than those taking place at the chain-level. Clearly, organic and certified coffee proved to be beneficial as compared to conventional coffee in terms of gains to the actors and sustainability point of view. There is a potential niche for India to develop eco-friendly coffees by leveraging the natural environment and biodiversity present in its coffee growing region – Western Ghats, a hotspot of biodiversity. These suggest that integrating sustainability principles in a broad-based branding strategy could be difficult at the level of the chain without institutional support or the entry of chain champions.

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JEL Codes: Q02, Q17

#642



Coffee Value Chains in India: Exploring Sustainability Oriented Markets

Introduction

The coffee sector in India is at an important transition phase in its development. Traditionally, vast majority of Indian coffee was marketed by the Indian Coffee Board as a commodity in the low-value segment as raw coffee which was blended with coffee from other countries. The market liberalization in the 1990s and emergence of Viet Nam as a strong competitor in the lower segment of the market, places the Indian coffee sector in a world market increasingly bifurcated between high-value specialty coffee and commodity sector dominated by Brazil and Viet Nam. To compete in this changing environment, India not only needs to improve the quality of its product offerings, but also penetrate into emerging growth segments, particularly since over 70 percent of Indian coffee is presently exported. This is also important from the standpoint of rural development, as smallholder production dominates the coffee sector.

The market for specialty coffees in particular is growing rapidly. This coffee segment represents 15 to 20 percent of the market in the United States, with growth rates of approximately 10 percent per year USAID (2010). Similarly, we find that certified coffees (e.g., Fairtrade, Utz, etc.) have achieved market shares of over 10 percent in some European markets (e.g., Scandinavia), with a 40 percent market share in the Netherlands. Growth rates for certified coffees have ranged between 20-25 percent per year compared to just 2 percent for conventional coffee (Pierrot, Giovannucci and Kasterine, 2011). While, the organic market remains small (around 3 percent of the market) but with a high growth rate of 29 percent per annum prior to the financial crisis (2000-2008) in the United States (Pay, 2009). These trends portend an important opportunity for India, provided its coffee can meet both the quality and attribute profiles of consumers.

A potential niche for India is in the development of eco-friendly coffees, leveraging the natural environment and biodiversity present in many regions. An opportunity for coffee growers is to incorporate practices that promote preservation of the natural environment with the production of higher quality, certified coffees. Much of the coffee in India is grown under shade cover conditions, but this market niche has not been fully exploited. This paper analyzes the integration of coffee producers into potential sustainability-oriented market segments. The analysis is presented through the lens of value chains by mapping the different coffee chains present in a predominantly coffee growing region, Kodagu, district, India as well as the governance structures that influence interactions and strategies for upgrading.

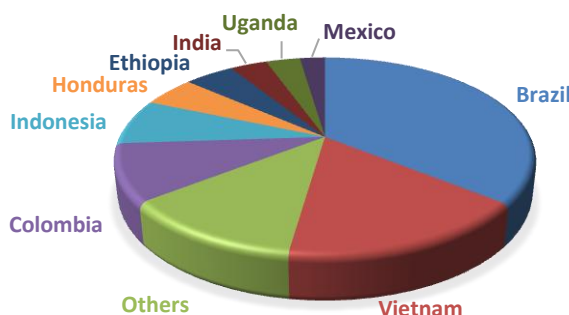
The analysis finds that value chains for coffee are largely diffuse in nature, with limited coordination in terms of quality and specifications in the conventional chain. Coordination is stronger in certified and organic chains, but incentives and motivation for upgrading largely stem from individual efforts to add value rather than those taking place at the chain-level. This suggests that integrating conservation principles in a branding strategy could be difficult at the level of the chain without institutional support or the entry of chain champions, though there are individual growers that could adopt such a strategy. On the other hand, integrating

conservation as a diversification activity could provide a low-cost way of adding value for growers while promoting good environmental stewardship.

Overview of the Global Coffee Industry

Coffee is the most popular beverage in the world with global consumption (151.3 million bag¹) exceeding its production (148 million bags) during 2015-16 (ICO, 2016). Coffee consumption is largely driven by economic conditions in consuming countries, with such fluctuations causing uncertainty in the income received by growers, the majority of whom are small and marginal holders (roughly 70 percent). More than 90 percent of global coffee production comes from developing countries, while over 70 percent of its consumption is concentrated in developed nations (Ponte, 2004). Brazil (35 percent) and Vietnam (15 percent) are the largest coffee producers in the world (Fig. 1). While, India with a share of 3.46% in the global production is placed at 7th position (2016-17). The domestic consumption of coffee is low at 68000 Metric Tons (GAIN Report 2017²) but has been steadily increasing at the rate of 5.75% per annum in the last two decades.

Fig 1: Top World Coffee Producing Countries (2016)



Source: ICO, 2016

The 1990s saw a significant alteration in coffee marketing with the introduction of new economic policy reforms during 1991-92 that ceased the Coffee Board's powers of monopoly procurement and sale of coffee produced in India. The introduction of Internal Sales Quota (ISQ) in 1993 followed by the Free Sale Quota (FSQ) in following year liberalized the coffee industry. These changes permitted coffee growers to first sell directly 30 per cent of their production and then 70 per cent in the following year. A final amendment in 1996 fully liberalized the market (Chattopadhyay and John, 2007). These policy changes have contributed to significant growth in the coffee industry.

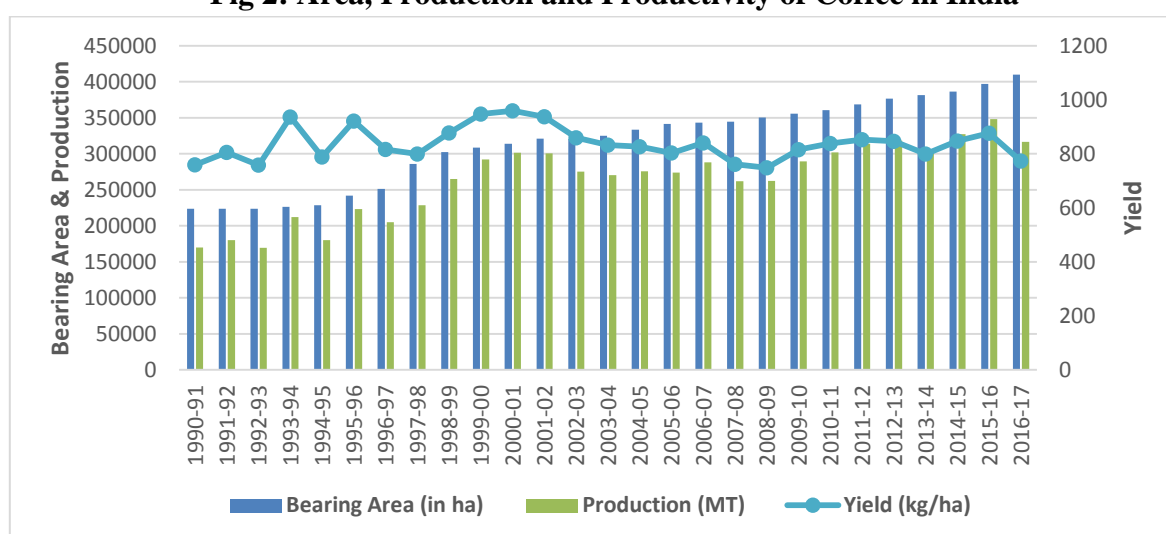
The bearing area under coffee increased from 0.27 million hectares in 1990-91 to 0.43 million hectares in 2016-17 (Fig.2). While, coffee production nearly doubled from 0.17 to 0.32 million tons during the same period. Of the total coffee produced, Robusta variety constituted 70 per cent and the Arabica variety formed rest 30 per cent. The production has increased over the last two decades by 1.45 per cent per annum, while the growth in bearing area was 1.82 per cent. There was a negative growth in production (-0.29 per cent) mainly attributed to a negative growth in yield (-2.10 per cent) for Arabica coffee due to biotic

¹ one bag of coffee is equivalent to 60 kg of clean coffee

² <https://www.fas.usda.gov/data/india-coffee-annual-1> accessed on 12-01-2018

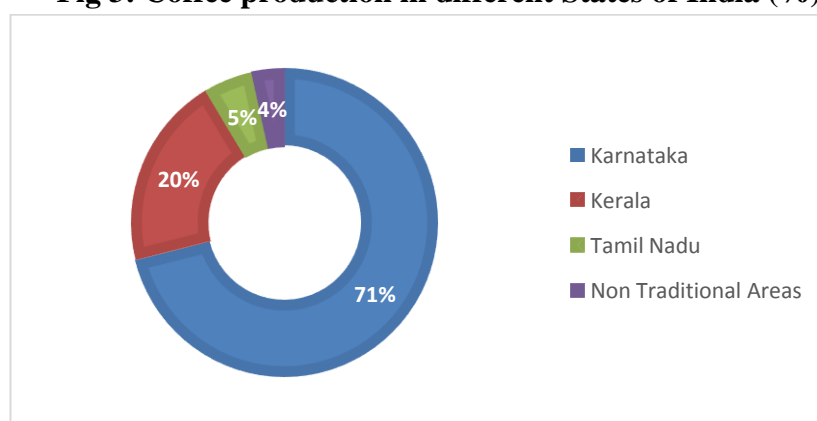
factor such as high infestation of white stem borer and abiotic stress factor as a result of erratic weather patterns in the coffee growing regions of India. However, the overall coffee yield has been improving in the recent decade, as shown by the positive growth in CAGR of yield (0.446 per cent). The coffee production in India witnessed a gradual increase with a clear shift from Arabica coffee to Robusta coffee. Overall, Robusta coffee recorded positive growth in productivity while stagnation is witnessed in yield of Arabica coffee. In India, coffee is mainly cultivated in the southern states of Karnataka, Kerala, and Tamil Nadu (Fig.3). Coffee is a key export crop, contributing around 3.5 percent of India's primary sector exports and providing direct and indirect employment to more than 200,000 persons annually. In the region of Kodagu in Karnataka, there are 42,014 coffee holdings of which 41,590 (98.9 per cent) are small producers. The Indian Coffee Board classifies small producers as those with coffee holdings below 10 hectares.

Fig 2: Area, Production and Productivity of Coffee in India



Source: India Coffee Board, 2018

Fig 3: Coffee production in different States of India (%)



Source: India Coffee Board, 2018

Previous studies have highlighted the problems of lengthy supply chains with superfluous intermediaries that have resulted in lower prices and lack of transparency between buyers and growers as major factors leading to lower prices received by producers (Achoth, 2005;

Bhavya, 2011). Chattopadhyay and John (2007) noticed that the disproportionate market power among downstream actors has resulted in small growers selling at prices lower than their cost of production, while traders and multinational corporations garner huge profits. In this context, an important area of inquiry is to assess how current value chains for coffee in India are adding value for producers, leveraging in particular areas in which sustainable strategies can be encouraged.

Embedding Sustainability in Value Chains

Across the ambit of innovation in value chains, embedding sustainability has been at the forefront and gaining traction as value chains are the biggest lever for change towards a sustainable future. Embedding sustainability requires more than independent isolated efforts of individual actors for transformation and needs an aligned collaborative performance of value chain actors in a synergistic manner towards a common sustainable strategy (Lassale-de Salinset al., 2014; Soosay and Hyland, 2015). The FAO (2014) proposed a guiding approach to incorporate and analyze sustainability in food value chains and develop strategies to improve sustainability across value chain activities. The approach is similar to the principles of the Shared Value concept (Porter and Kramer, 2011), combining an analysis of the actors' needs and expectations with practices to achieve greater sustainable results.

As a result of various economic reforms, liberalization and cost pressures among others that have plagued the coffee sector, a number of private and multi-stakeholder initiatives have been launched to promote more socially responsible and environmentally friendly practices in coffee production (Petkova, 2006). These initiatives have resulted in the development of sustainability standards which are now increasingly being adopted such as Fairtrade, Rainforest Alliance, Utz and 4C among others. These initiatives would induce a move towards a mode of governance that is closer to the producer-driven chain structure as it could improve the growers' position vis-à-vis roasters/traders (Muradian and Pelupessy, 2005). As such, Voluntary Sustainability Standards (VSS) adoption by coffee farms is rapidly becoming a *sine qua non* for access to specialty coffee markets.

Regulation of externally authored ethical and environmental standards were found to have several implications for value chain structures and institutions in the small-holder coffee systems of Indonesia. Neilson (2008) observed that the sustainable coffee agenda has resulted in structural changes in modes of grower organization, trader –grower relationships, enhanced product traceability and increasing the presence of multinational trading companies. Based on a matched panel analysis of 218 coffee growing farm households belonging to three cooperatives in Central Kenya, Van Rijsbergen et al (2016) found that Fairtrade and Utz-certified coffee production improved coffee returns, however Fairtrade was more effective in coffee processing, whereas Utz contributed to productivity. Under stagnating coffee prices, Fairtrade growers increased their coffee specialization, while Utz growers reduced coffee areas but increased yield. Further, Bolwig et al (2013) used a Heckman selection model to identify the revenue effect from certification and concluded that the largest effects were due to engagement in coffee processing. While, Mendez et al. (2010) demonstrated that Fairtrade-certified growers receive better prices and higher coffee revenues, but sales to certified markets were far too limited for reaching sustainable livelihood effects. In Peru, Ruben & Fort (2012) observed modest direct income and production effects, but significant changes in organization, input use, wealth and assets, and

risk attitudes among small coffee producers. However, corporate definitions of sustainable production have challenged local and national level institutional structures and have often not offered developmental support which questions the effectiveness of such schemes as they were originally developed to deliver development benefits to alleviate communities in developing countries. Minten et al (2018) found that the quality premiums on coffee were small and only less than one-third of this premium were passed on to the producer. Snider et al (2017) stated that although financial incentives were weak, certification offered non-financial benefits to growers and cooperatives, including better management and more resilient cooperatives. The social effects of Fair trade certification on small coffee producers in Rwanda were assessed using a logistic regression model by measuring grower trust and participation. The results showed a positive association with a perceived higher level of participation of women. A gender analysis in certified coffee production and marketing in Uganda concluded that there is a greater need to integrate gender into all stages of the coffee value chains as women were positioned at the bottom of the value chain (Kasente, 2012). Kundu & Chopra (2009) mapped the traditional Indian coffee value chain. The project used digital tracing technologies in value chains to provide consumers and producers with enhanced information and thereby differentiate the product.

Methodology

Kodagu district of Karnataka was purposively selected for the study as coffee-based farming system accounts for 38 percent of India's total coffee production. In the district, coffee is produced under native and exotic tree cover following a sustainable agro-forestry system, supporting rich tree diversity with pepper grown on shade trees and cardamom grown in the valleys as intercrops. Moreover, Kodagu is an area rich in biodiversity endemic to the region and is part of the Western Ghats Biodiversity Hotspot. These factors highlight the potential for ecologically-based coffee in Kodagu though this requires an understanding of current value chain relationships and governance structures to assess the entry points for such production. Therefore, the study used both qualitative (involving extensive field observations on production and marketing practices) and quantitative data collected for coffee value chain actors in Kodagu during February-April 2013 period and the data is based on the coffee year 2011-12. A semi-structured, pre-tested survey with both open and close ended questions was used to collect relevant information from growers based on their records and memory. The survey addressed information related to production, costs of cultivation, processing and marketing practices. For other downstream actors, separate checklists were used, with information on costs, returns, and marketing practices elicited through facilitated discussions. Secondary data were collected from the publications of the Indian Coffee Board and International Coffee Organization.

The sample included 52 growers comprising of 31 conventional, 15 certified, and 6 organic growers; five traders; three hullers; three curers; four roasters; and eight retailers. The analysis of the data involved computation of simple descriptive statistics to estimate costs of production³, transaction costs, returns, value-added, and margins for clean coffee.

³ To maintain uniformity, for all actors, cost, returns and value added have been presented for clean coffee

The Value Links methodology in the analysis was adopted from GIZ (2008) that expands the value chain tools and methods explicated by Kaplinsky and Morris (2001) in a manner that better operationalise the mechanisms for chain upgrading. Aspects from the FAO's Sustainable Food Value were also attempted to be incorporated into the study to understand the various dimensions of sustainability within the coffee value chain (FAO, 2014). In this context, the study first identified the key players/operators involved in the marketing channel, mapping these relationships graphically and identifying supporters, enablers, and disablers in the chain. We further assessed governance relationships based on methods motivated by Gereffi (2005) and Risgaard et al (2008). Based on this analysis, different sustainability-oriented upgrading strategies were explored.

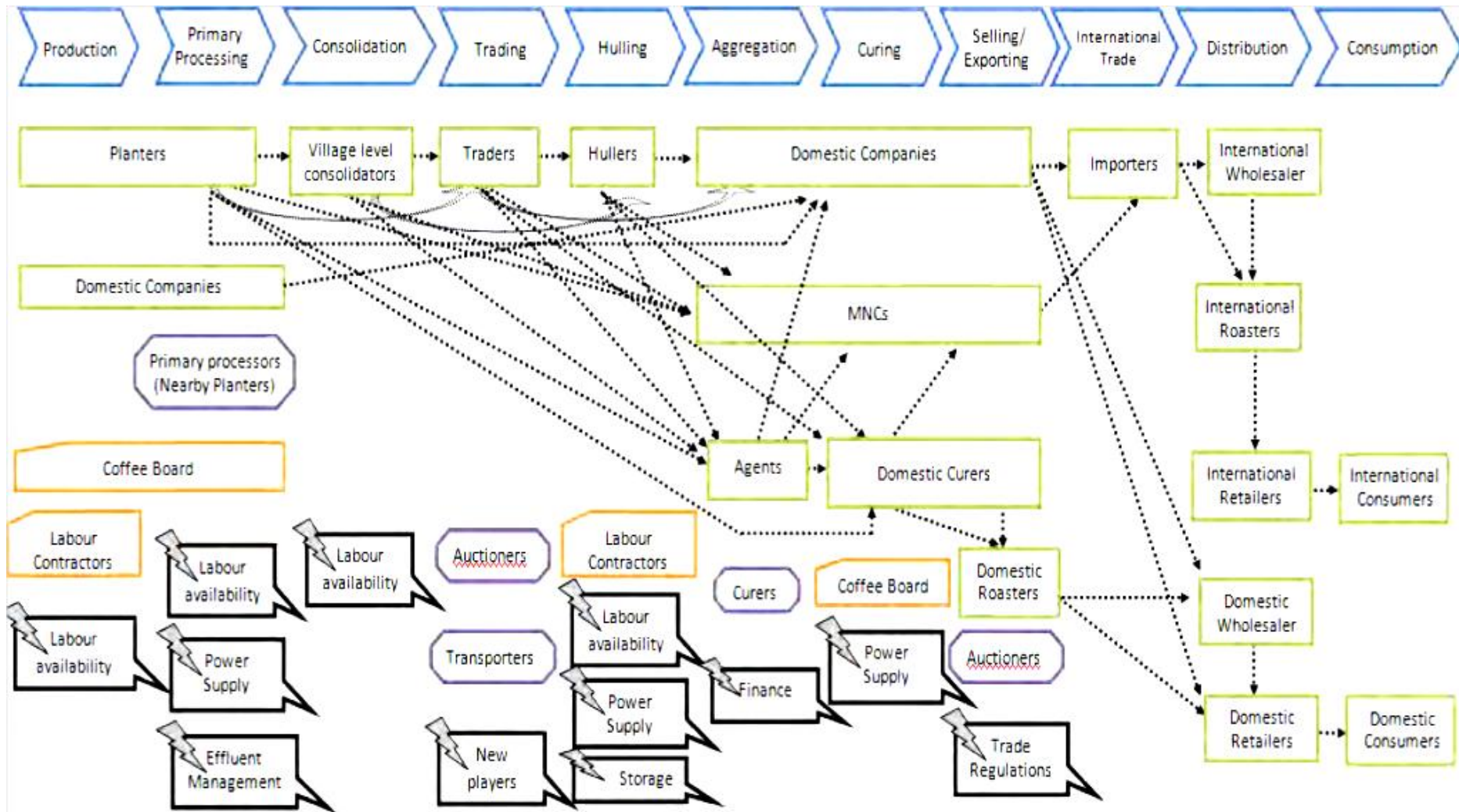
Mapping of coffee value chains in India

Three distinct types of production systems for coffee were identified in the study: conventional, certified, and organic coffee. Based on the Value Links methodology, a differentiation is made between the processes in the chain (denoted by the large arrow) and the narrow arrows link the various actors associated with the different processes (denoted by rectangles), and various institutional supporters (denoted by trapezoids and orange boxes). Constraints existing in the conventional coffee value chain were depicted by comment boxes with a lightning bolt. An advantage of the Value Links approach is the visual disaggregation between processes, people, and supporters to illustrate complex systems in a more transparent way.

The conventional coffee value chain processes in India (Fig 4) comprised of producers (referred to as growers), village level consolidators, traders, hullers, agent aggregators, curers, auctioneers, domestic companies, multinational companies (MNCs), brokers, exporters and international traders, domestic and international roasters, wholesalers, retailers, and consumers among others. Wherever an actor undertakes more than one function, a larger rectangle is used to depict this (e.g. domestic companies and MNCs undertaking aggregation, curing, and export as shown in Fig. 4).

By contrast, the certified and organic chains (Fig. 5) involve significantly fewer actors, particularly intermediaries such as traders or consolidators. In the certified chain, direct linkages exist between growers and buyers (MNCs) that apparently can improve market communication and facilitate the adoption of new practices to add value. Certification clearly provides value addition and complete traceability of the produce maintained throughout the chain of custody. Particularly, in the organic chain, growers take a more integrated role in many functions of the chain, including processing, local trading, and exports that allows them to add significantly more value (and receive more earnings from chain participation), though this also requires more investment and a greater tolerance for risk. Organic certification included stringent practices but fetched higher price premiums. Instances of organic producers switching back to conventional production were not uncommon mainly due to reduction of yield during transition period.

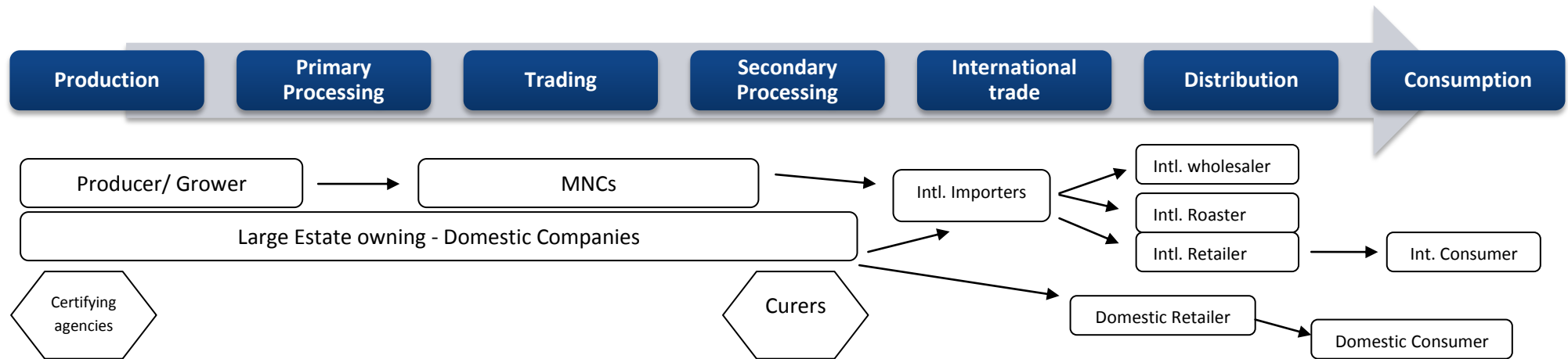
Fig 4: Traditional Coffee Value Chain in India



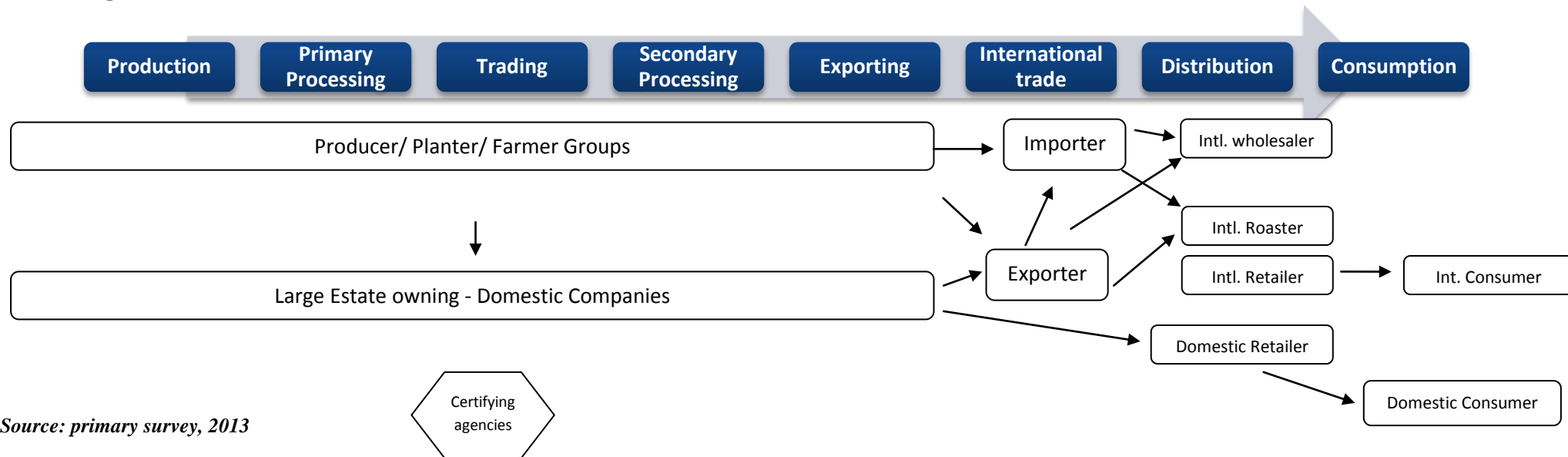
Source: primary survey, 2013

Fig 5: Value chains for Certified and Organic coffee in India

a) Certified coffee



b) Organic coffee



Source: primary survey, 2013

From the field survey, with respect to the conventional coffee growers, the cultivation of Robusta was less expensive (Rs **80,709/ha**) compared to Arabica (Rs. **97,757/ha**) (Table 1). In both cases, labour and fertilizer formed the main cost items, with wages forming 60% and 65% of the total cost in Arabica and Robusta, respectively. The operations that required higher labour inputs were coffee picking and processing, shade management, and pruning⁴. Rising labour costs and erratic labour availability emerged as serious problems confronting the coffee industry. Though mechanization is an option, labour availability continued to be a crucial factor, as the uneven planting and small holding size of most farms limited its wider adoption. Processing costs for Robusta (cherry) growers were lower (Rs. **1,574** per ha) compared to Arabica (parchment) at Rs.**7,907** per ha mainly because of the processing type followed. However, since Arabica parchment attracts higher prices (Rs.160/kg) compared to Robusta cherry (Rs.120/kg), the net returns for Arabica have been higher (Rs. **1,46,414/ ha**, Table 2). Other factors that affect prices are the time of sale and certification process followed. Half of the interviewed growers sold their coffee immediately after the harvest, in the months of January and February.

Table 1: Costs and returns of conventional coffee cultivation in Kodagu.

Items	Arabica Parchment		Robusta Cherry	
	Costs	% to total cost	Costs	% to total cost
Labour (Rs. /ha.)	58,457.62	59.8	52,618.54	65.2
Fertilizer (Rs. /ha.)	19,269.25	19.7	1,75,632.35	21.8
Chemical (Rs. /ha.)	4,872.91	5.0	1,487.57	1.8
Primary processing (Rs. /ha.)	7,907.36	8.1	1,574.06	2.0
Irrigation (Rs. /ha.)	7,247.59	7.4	7,467.51	9. 2
Total Cost (Rs. /ha.)	97,757.21	100	80,709.43	100
Average Yield (kg of clean coffee)	1522.16		1,660.54	
Average price (Rs./kg of clean coffee)	160.0		120.0	
Gross Returns (Rs. /ha.)	2,44,181.75		1,98,771.26	
Net Returns (Rs. /ha.)	1,46,414.65		1,18,064.3	
Returns to rupee of investment	2.49		2.46	
Cost of Production (Rs./ton)	64,208		48,571	
Returns (Rs./ton)	160,380		119,620	
Net Returns (Rs./ton)	96,172		71,049	

Note: One US\$ = Indian Rupees Rs. 64/-

Source: primary survey, 2013

The difference in the returns of certified, organic, and conventional coffee farming practices has been reflected using a partial budgeting analysis summarized in Table 3. The cost incurred for certification (Rs.528/ha) is small, as those growers that adopt certification practices usually have most of the required facilities. However, interviewed growers revealed that they were not satisfied with the premium received (Rs.2458/ha). Moreover, most growers indicated that they could sell only 40 percent of their certified coffee production as certified coffees mainly due to problems related to its transportation to specific buyers at their location. Undertaking individual and group certification by MNCs involving NGOs (group

⁴Other operations involving labour are weeding, chemical application and particularly, stem borer tracing in the case of Arabica

certification) in the case of small growers helped in realizing premiums as they can access new markets. On the other hand, organic certification indicated an advantage with increased returns and reduced costs, once yield levels stabilized after conversion to organic practices (Table 2).

Table 2: Partial budgets of different types of coffee cultivation (Rs./ha).

Certified robusta	Organic robusta	Conventional robusta
Total costs associated with certified farming practices A1 = 81,238.23	Total costs associated with organic farming practices A2 = 67,919.28	Total costs associated with conventional farming practices C = 80,709.43
Additional costs associated with certified farming practices $X=A1- C= 528.8$	Additional costs associated with organic farming practices $X=A2-C= 12,790.15$	-
Gross return available if certified practices were followed B1 = 2,01,758.76	Gross return available if organic practices were followed B2 = 2,02,739.77	Gross return available if conventional practices were followed D = 1,98,771.26
Additional return associated with certified farming practices $Y = B1 - D= 2,987.5$	Additional return associated with organic farming practices $Y= B2- D=3,968.51$	-
Net return from certified farming practices E = (B1-A) =1,20,520.53	Net return from organic farming practices E = (B2 - A) =1,34,820.49	Net return from conventional farming practices F = (D-C) = 1,18,061.83
Net gain from certified practices (E-F) = 2,458.7	Net gain from organic practices (E-F) = 16,758.66	-

Source: Primary survey, 2013

Typically, the quality of coffee depends greatly on the method of picking and processing. During the survey, it was found that growers (especially large holders) were more quality-conscious and practiced selective picking to ensure higher quality, even though it led to increased labour costs. The Table 3 showed that a majority of Arabica growers with facilities for wet processing practiced three rounds of picking: first selective picking referred to as fly picking, followed by a second round of selective picking, and finally the stripping of all the remaining berries. By contrast, most Robusta growers either practiced stripping or two rounds of selective picking. It is interesting to note that the average price following three rounds of the selective picking of Robusta cherry was 12.5 percent higher compared to stripping.

The method of drying also has an impact on the quality of coffee. In the past, it was a common practice to use raised perforated tables to dry the coffee cherry/parchment but this is hardly in use at present because of the high costs involved⁵. Presently, only organic growers with an orientation towards the international market follow the perforated table method of drying. In our survey, only three interviewed growers used such tables, with most growers using either cemented or tiled floors, while a few others used plastic sheets or shade nets

⁵ Presently, only organic growers with an orientation towards the international market follow the perforated table method of drying.

spread on the mud floor. The latter practice reduces the quality as the beans absorb the moisture and bad odor from the ground surface.

Table 3: Coffee harvesting practices among growers in Kodagu district.

	Harvest type	Stripping	Selective picking (twice)	Selective picking (thrice)
Arabica	Growers (%)	16	20	64
	Average price (Rs./kg)	129.17	132.83	135.33
Robusta	Growers (%)	48.08	32.69	19.23
	Average price (Rs./kg)	48.33	52.08	55.83

Source: Primary survey, 2013

The picked ripe berries of coffee were processed primarily at the farm level into either cherry (dry processing) and/or parchment coffee (wet processing)⁶. In Kodagu, a vast majority of growers use dry processing techniques, where the harvested coffee fruits are spread over in the drying yard or floor (mud/cement/tile) and dried in the sun. Fresh berries can also be first pulped, followed by sun drying to obtain ‘parchment’ coffee (this process is referred to as wet processing. The study sample indicated that Arabica was mostly processed into parchment (82 percent) while for Robusta cherry processing constituted 74 percent. After dry or wet processing, conventional coffee moved to village level consolidators or traders, who further sell coffee to large traders, hullers, curing works, facilitators/agents of MNCs and exporters. Figure 4 and 5 illustrate the movement of coffee from growers to the next level through five different types of intermediaries namely, local traders, hullers, brokers, curing agencies, and exporters.

Table 4 specifically highlights the diversity of sales channels utilized by certified and organic growers, the range of intermediaries are lower as there was a direct linkage between larger buyers and such types of farms. These companies sourced both certified and conventional coffee, mainly from larger producers, traders, hullers, agents and curing agencies (Figures 4 and 5).

Table 4. Sales practices followed by coffee growers (in percentage)

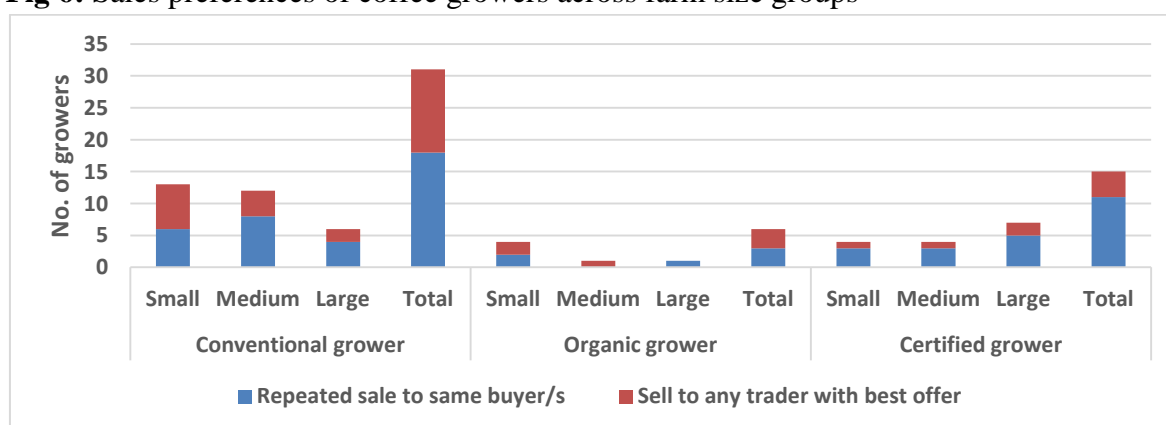
Coffee Type	Actors	Trader	Companies	Curer	Auctioneer	Exporter	Broker	Huller	Total (No.)
	Grower Type								
Arabica Cherry	Conventional	70	-	20	-	-	10	-	10
	Organic	-	100	-	-	-	-	-	2
	Certified	40	50	-	-	-	-	10	10
Arabica Parchment	Conventional	57.14	14.29	28.57	-	-	-	-	7
	Organic	-	-	-	-	100	-	-	1
	Certified	33.33	55.55	-	-	-	-	11.11	9
Robusta Cherry	Conventional	76.67	6.67	6.67	-	-	6.67	3.33	30
	Organic	20	80	-	-	-	-	-	5
	Certified	4.61	30.77	7.69	-	-	-	15.38	13
Robusta Parchment	Conventional	57.14	-	28.57	14.28	-	-	-	7
	Organic	-	-	-	-	100	-	-	2
	Certified	-	85.71	14.28	-	-	-	-	7

Source: Primary survey, 2013

⁶ Those who engage in parchment processing need to process a small portion as cherry (approximately 10%) consisting of floats in the pulping process.

In Kodagu district, over 80 percent of growers sell their produce at farm gate due to easy access to village level consolidators, traders, and hullers (Upendranadh & Subbaiah, 2012). These village level consolidators and traders provide transport facilities and gunny bags for packing. A few growers also used consignment sale facilities provided by buyers, while others took cash advances ahead of coffee sales to meet their personal and coffee production expenses. Though most growers timed the sale of their produce (in several consignments) based on their financial requirements, the majority of smallholder producers sold their produce immediately after processing at farm level. Only, a few growers sold their produce to agents/facilitators of domestic companies and MNCs. Nearly two-thirds (62 percent) of the sampled coffee growers sold their coffee to a particular trader or a set of traders with whom they had maintained a consistent trading relationship. Small growers preferred higher prices and cash payments and hence sold to the trader offering the best price (Fig 6).

Fig 6: Sales preferences of coffee growers across farm size groups



Note: Small grower: Less than 4 ha, Medium growers: 4 to 10 ha, Large growers: Above 10 ha

Source: Primary survey, 2013

In purchasing coffee, moisture and outturn⁷ are the two major criteria considered by all buyers. Twelve percent moisture content and 52 per cent outturn are the standard norms of the industry for Robusta cherry coffee. If growers fail to maintain these standards, pro rata deductions are made from the final price. Similarly, if the quality parameters are above the stipulated standard, premiums are paid. Most traders and hulling units have facilities to test samples. Larger coffee growers tend to have greater access to competitive marketing arrangements, with most of them selling their coffee to curers who offered accurate outturn and competitive market prices. In the conventional coffee chain, estate level processed coffee was subsequently sold to local traders, who act on behalf of block level traders and hullers. Based on the quality parameters (from a sample of a kilogram of processed Robusta cherry), traders make their price offers to growers. Growers also obtain other similar bids from different players in the local market and the one who makes the best offer is chosen for sale. Small growers preferred working with local traders as they provide gunny bags, weighing

⁷ This refers to the rate of conversion of cherry/parchment to clean coffee

facilities, transportation from the grower's doorstep, and immediate cash payment⁸. It is interesting to note that while these actors offer competitive prices at par with larger traders, curers, and MNCs, some may resort to the use of fraudulent practices such as under weighing, unauthorized quality deductions, and not providing premiums based on exact outturn⁹. The prevalence of such practices indicates marketing inefficiency, depriving growers of competitive prices. Table 5 summarizes some of the costs and returns associated with downstream actors in each of the value chains under study. In the conventional chain, local traders incurred transportation costs of Rs. 475 per ton of dry cherry and Rs.30/ton for quality testing and search costs to source sellers. Margins for local traders were estimated at Rs. 1,875/ton despite non value adding to the product (Table 6). Out of six traders interviewed, four of them also performed hulling activities to obtain higher margins in the value chain.

Hulling is the process of removing the outer skin of dry cherry coffee that yields estate pounded coffee. Hullers are typically located near the production centers and act as intermediary processors thereby reducing the transportation cost. The removed husk is then used in curing tobacco; is also a good source of manure. In the case of those who sell dry cherries directly to MNCs or curing agents, transportation costs were higher as they were located farther away from these buyers, thus reducing the value chain efficiency. Most hullers rely on local traders for sourcing coffee. Hulling units not only undertake processing of their own coffee, but also offer custom hulling services to growers or traders at a fee of Rs.400 per ton. Overall, the net returns worked to Rs. 5,479 per ton of processed clean coffee (Table 5). Hullers face high volatility in coffee prices and hence sell the processed coffee on the same day to insure themselves against the volatility of prices. In the conventional chain, the processing cost of hullers was estimated at Rs.335/ton (Table 5). Hullers also incurred costs for transport, storage, office maintenance, and fixed cost for storage. Due to erratic electricity supply in the region, many hulling units maintained diesel generator sets to continue business operations. Hullers sell their produce to the agent aggregators, MNCs, or curing works. Transportation cost is borne by hullers themselves and they receive payments immediately either in cash or via the bank. It is important to note that hullers not only undertake processing (hulling) but trading as well.

Agent aggregators provide a vital link between growers, curers, and exporters, given the bulky nature of coffee and long distances required to be covered in procurement. Eight agent aggregators operate in the study area (Kushalnagar, a coffee processing hub). Of them, one was interviewed to elicit information through a semi-structured schedule. This agent aggregator operated in all three coffee growing districts and handled 35,000 tons of coffee during 2011-12. Eighty percent of this trade was in Robusta and the rest was in Arabica. In the case of Robusta, 90 percent was in the form of cherry, while in the case of Arabica, parchment formed over 60 percent of the volume. The agent aggregator facilitated large

⁸ Immediate payments in cash are considered crucial by small growers as many lost their money due to late payments during market volatility in early 2000.

⁹ For example, if the outturn is 52.5%, a local trader would pay based on an outturn of 52%, thus making a considerable net gain (half a kg for every 100 kg of cherry).

companies in procuring their requirements, and incurred costs for transportation (Rs 220/ton), bank interest, communication, and maintenance of an office (Rs. 75/ton). The aggregator did not maintain his own storage as he utilized the warehouse facilities of the curers to whom he sold coffee. The agent aggregator sold coffee immediately (within a day) to large buyers. The net profit for the agent aggregator in the conventional chain was estimated at Rs. 1,705/ton (Table 5).

Curing is the most important value adding function in the coffee value chain. The process involves removing the outer cover of the dry cherry and silver skin in the case of plantation (washed) coffee and sorting into grades of clean coffee. There are over 70 curing works in India, most of which were medium and small units that handle relatively small volumes with low technology, and then sold the cured coffee to exporters or domestic roasters involved in the coffee business. Three types of curing agencies are identified: (i) MNCs with state of art curing infrastructure and technologies with mechanized process that enables large scale operations; (ii) local curers operating with moderate levels of technology; and (iii) small scale operators with traditional technology. The entry of large players, mainly MNCs, over the last decade has led to market concentration, with such companies undertaking a variety of processing and marketing tasks such as curing, certification, export, branding, and retailing, resulting in high level of functional integration. In the conventional chain, given an average sale price of Rs.143/kg for clean Robusta coffee, the net profit to the curer was Rs.12,067/ton. The main cost incurred by curers related to transport, estimated at Rs.1,091/ton (Table 5).

Roasters play an important role in reaching the end market of the value chain. They are stringent on the quality parameters of coffee as they have direct links and feedback with consumers. Roasting is the deciding factor in bringing about market acceptance. Roasters blend different varieties and grades of coffee beans before undertaking roasting to a desired level. Many roasters hold long-term contracts with curers and a few larger growers, though most of the procurement occurs through commission agents, hullers, and curers. Basically, there are two categories of roasters. The first combines roles as both a roaster and retailer, whereby; roasted beans are ground and sold in local coffee shops. The second type comprised of large operators, who basically are wholesalers that distribute roasted beans to retailers locally, regionally, or nationally. This category includes players like Café Coffee Day, Bayers coffee and Cothas Coffee, in addition to many local players. In the conventional chain, roasters obtained an average net margin of Rs. 12,668/ton, the highest of any actor in the coffee value chain (Table 5).

Table 5. Costs, Returns and Margins to actors in the coffee value chain for Conventional, Organic and Certified Coffee (Rs/ton of clean robusta coffee):

Actors		Growers			Village level consolidators	Hullers	Agents	Curers/MNCs		Roasters	Retailers	Domestic Companies	Domestic Retailers
Particulars		Con	Org	Cert	Conventional			Con	Cert	Conventional		Org	Org
Costs	Production/procurement	47,041	37615	47226	119,620	122,000	127,000	129,000	121420	143,000	160,000	124500	286000
	Fixed Cost	400	1470	678	-	273	-	488	3200	206	600	621	238
	Transportation	450	473	-	475	-	220	1091	412	1067	2,100	1036	689
	Storage	25	85	71	-	62	-	97	217	163	20	198	152
	Value added/processing	654	761	756	-	335	-	172	718	2817	2,424	1974	1902
	Others	-	1305	158	30	50	75	85	142	80	230	602	308
	Total	48,571	41709	48889	120,125	122,721	127,295	130,932	126109	147,332	164,834	128931	289289
Returns	Main product	119,620	124500	121420	122,000	127,000	129,000	143,000	-	160,000	181,000	286000	374400
	By-products	-	-	-	-	1,200	-	-	-	-	-	900	-
	Total	119,620	124500	121420	122,000	128,200	129,000	143,000	-	160,000	181,000	286900	374400
Margin	Rs/tonne of dried cherry/ clean coffee	71,049	82791	72531	1,875	5,479	1,705	12,068		12,668	16,166	157969	85111
	Rs/kg of dried cherry	71			1.9	10.3	3.2	22.8		23.9	30.5		
	Share of total margin (%)	43			1.1	6.3	2.0	13.9		14.6	18.6		

Note: * Unit is not applicable for margin.

Con – Conventional, Org – Organic, Cert - Certified

Source: Primary survey, 2013

Governance in the coffee value chain

The coffee value chain in Kodagu is characterized by distinct governance patterns that vary by the specific markets targeted (conventional, certified and organic). The governance framework of Gereffi et al (2005) identified five different governance forms – market, modular, relational, captive, and hierarchy – based on the complexity of transactions, the ability to codify transactions, and capabilities within the supply base. In the conventional coffee value chain, market forms of governance prevail. In such settings, prices and basic quality specifications define transactions between growers and downstream actors, with relative little in the way of explicit coordination between the supply base (i.e., growers) and downstream actors responsible for generating value-added (e.g., curers, roasters) in terms of specific required characteristics of coffee. Moreover, the diversity and number of intermediaries between growers and final buyers mediates the information obtained by growers to produce more specialized products. While growers largely remarked that their products are of high quality, the prices received in the conventional chain tended to be lower, as market destinations for such products were largely bulk commodity markets (instant coffee, blends, etc.).

Certified value chains for coffee resembled a mix of market and modular forms of governance, given the slightly greater levels of complexity associated with meeting the rules of the certification standards. However, even in such chains, the degree of explicit coordination between growers and downstream actors, or among different downstream actors, remains relatively low. Once certified coffee is purchased from growers, the main area of coordination downstream is through maintaining the chain of custody of certified products throughout the value chain, though little attention is given in associating certified coffee with efforts towards higher quality or market differentiation. In this manner, certification is only a simple form of product differentiation, with limited price premiums. In fact, growers in Kodagu reported premiums of between Rs.50-150 per bag (of 50 kg), roughly 2-3 percent higher than the conventional price. At the same time, certification also increased the potential power asymmetries between growers and buyers, given that rules were imposed externally on growers with little negotiation possible on compliance. However, most interviewed certified growers suggested that compliance with certification was both clear and inexpensive.

The organic value chain clearly exhibited modular forms of governance, with growers not only engaged in more complex transactions at the production level, but also undertaking value-adding functions within the value chain in terms of processing. *Prima facie*, the functional upgrading undertaken by organic producers could serve as a counterbalance to the potential power asymmetries resulting from compliance with international organic standards. On the other hand, survey results reported suggest that both the clarity and expense of compliance with certification were higher for organic producers than certified growers, though this has also generated higher prices and greater market access. The greater internal and external integration within the organic coffee value chain further suggested greater ease in developing higher quality products and addressing new market niches than either the conventional or certified coffee value chains.

The global trend towards certified products potentially exposes actors in the conventional coffee chain to be excluded from international markets, particularly small growers. Group certification with support from NGOs is one means to reduce producer vulnerability. At the same time, as global coffee markets become increasingly segmented and value segments lost to lower cost competitors (e.g., Viet Nam), the general lack of quality orientation within the Indian coffee value chain and limited value chain coordination given the dispersion among value chain actors potentially restrict the ability of the value chain to respond to emerging trends. A few suggestions (Table 6) have been made to reorient the sustainable coffee segment towards addressing local vulnerabilities embedded within the externally designed sustainability standards.

Table 6. Coffee value chain challenges and avenues for incorporation of sustainability

Value chain elements	Challenges	Embedding Sustainability	Region specific priorities for Coffee VC Actor
Social	Food insecurity, Malnutrition	Improve farm workforce standard of living (health, housing)	Initiatives based on recommendations of all actors rather than top-down and dictated via international agencies Impartial participation – not self-selection by Export and coffee producer
	Poor access to education and healthcare, Labour rights		
	Gender inequality		
	Ageing grower communities	Encouragement from Extension departments	
	Migration of young growers		
	Dispersed actors – poor bargaining power	Increase organizational participation	Development of networks through cooperative efforts
Economic	Green Bean price volatility	Participation in sustainable certification programmes stabilize returns	Roasters and brand owners need to equitable distribute revenue shares
	Long term decreasing real coffee prices		Value-added markets
	Entry barriers	Traceability and audit trail	Transparency across all actors in production, processing, storage and transportation
	Lack of market information	Enhance ICT across the sector	Domestic and international traders, MNCs, Roasters
	Lack of product information		
	Rising living costs		Financial incentives to participate in Voluntary Sustainability Standards (PES)
	Access to finance	Improve financial position	Collective guarantees among producers to access finance
	Ageing coffee plants	Rejuvenation (finance from various sources including private actors in the Voluntary Sustainability Standards)	Shade trees increase lifespan of coffee plants (Boffa, 2003)
	Limited access to insurance and hedging instruments	Access to insurance based on ground realities	Initiatives by the actors representing Voluntary Sustainability Standards

	Poor services through local, cooperative grower organizations	Institutional capacity building Access to extension advice	With Support and collaboration from national institutions Consultation and involvement of producers in technical forums formulating VSS to define priorities
Environmental	Evolving Pests and diseases	Organic inputs	Growers, Estates, and large plantations
	Loss of diversity	Participation in voluntary networks	Differentiate coffee via symbolic quality and unique attributes, geographical indications
	Soil erosion and degradation		
	Inappropriate use of agrochemicals		
	Depletion of water supply	Efficient usage of water resources	Curing Plants Hulling and other processing agents
	Limited waste water management	Effluent management	Upgraded machinery for efficient use of water and electricity Sustainable use of coffee industry by-products (Murthy & Naidu, 2012)
	Climate change and volatility	Diversify the coffee crop to increase soil nutrients, shade	Growers, Estates, and large plantations Sustainability stakeholder consultations for mitigation and adopting climate-smart production practices
Infrastructure	Erratic Power Supply	Renewable sources of energy	Renewable technological machinery
	Limited number of certified curers	Upgrade Curers	Curer certification

Source: Modified based on Samper et al (2017)

Strategies for up gradation in the Indian coffee value chain

Different actors within the coffee value chain currently undertake a variety of upgrading strategies. Given the pressures in remaining competitive, cost-saving technologies, particularly those that involve mechanization (given increasingly costly and scarce labor) have been increasingly adopted. Further downstream, there were moves among some curers to increase their functions within the value chain, as well as by roasters to diversify market outlets and product offerings. Auction markets have also become an increasingly common way to market coffee. Two auctioneers, J. Thomas & Co. Pvt Ltd., and Forbes, Ewart & Figgs Pvt. Ltd., are involved in the auctioning of coffee through the Indian Coffee Trading Association (ICTA), in the premises of the Indian Coffee Board in Bangalore. The weekly auctions include the displaying of a sample of 500 gram/lot that specifies the grade and quantity offered. The lot size varies from 250 to 1,500 kg. This channel provides opportunity to sell coffee at a competitive price by reducing intermediaries.

However, the study concluded that such innovative efforts were individually motivated. For instance, four surveyed growers in Kodagu were found to engage in estate level branding to identify the place of origin and the environment in which coffee is grown. Of the six organic producers interviewed, three sold their coffee using their own brand name; two exported to international markets (Palthope and Balmore) while the other sold locally within Kodagu (Jaivik Greens) from an outlet located in Kushalnagar and has burgeoning plans to

expand sales in Bangalore. In addition, the President of the Specialty Coffee Association of India sold his estate brand, Balnoor, in the German market. Individual-level efforts have further been made to link a grower with a roaster to engage in online sales of the brand ‘Appa’s Coffee’ in different Indian urban markets. The specialty segment of India also produces single estate/single cultivar plantation-A coffees that have distinct characteristics like coffees from Attikan Estate, Yellikodige estate, Watapi estate among others that can be explored and incentivized. However, these efforts tend to be specific cases, with the majority of the growers content to produce for the conventional commodity markets. Indeed, revisiting the economics of coffee production as found in tables 1 and 2 highlight that for those farms with adequate size (e.g. over 100 acres), coffee production was relatively profitable. Conversely, many smaller farms typically do not have the capital to engage in riskier endeavors such as estate branding or marketing, and as such value chains were diffused and there is a lack of “chain champions” to drive such innovations forward. Improved institutional support through producer associations or better contractual linkages between buyers and growers could be one way to address this, but that requires leadership and vision in the chain.

What about the role of sustainability and biodiversity conservation? There is the potential of exploring a segment that could try to bridge the link between producers and consumers by personalizing the efforts put forth by growers. However, the challenges in this type of strategy are threefold. First, distinguishing such a brand in an increasingly competitive niche of ecologically-based products (e.g., bird-friendly coffee) in global markets is not trivial. Second, a niche market strategy that tried to personalize conservation efforts of producers would necessarily require a significant market premium to pay for the brand, and subsequently require products of sufficiently high quality. In Kodagu, where the majority of production is low-value Robusta, bridging this quality gap would be difficult, though possible with a small group of producers. Third, the disperse nature of the coffee chain would make such a strategy difficult within significant efforts at coordination and building market linkages, again adding costs to this type of strategies. This is not to imply that such a market niche is not viable, but it is likely to follow the individual efforts cited above rather than a sector-wide initiative that could involve numerous actors.

A second strategy, and one that is potentially more viable, is to develop practices on-farm that diversify the product offerings themselves of growers to include conservation-oriented goods. The third strategy would be to bring in ecotourism that complements and educates people on the functioning of a coffee farm, its biodiversity and natural environment (Aylward et al, 1996; Chengappa et al. 2017).

Conclusion and Policy suggestions

The Indian coffee sector is at an important point of transition, wedged between quality and value segments of the market. Traditional means of marketing and production are increasingly under threat from market pressures, with new strategies for diversification of income streams and production lines necessary. There is a potential niche for India to develop eco-friendly coffees by leveraging the natural environment and biodiversity present in its

coffee growing regions that are largely comprised in one of the world's biodiversity hotspots – Western Ghats. Results from coffee value chain analysis indicate that organic and certified coffee proved beneficial as compared to conventional coffee in terms of gains to the actors and sustainability point of view. Qualitative assessment highlighted some of the challenges faced in the value chain and explored the possibility of conservation-based activities. While adding another conservation-focused brand is potentially challenging at a large scale given the diffuse nature of coordination in the different value chains, integrating simple, relatively low-cost activities based on ecotourism seems potentially viable and accessible for a range of stakeholders, particularly small growers. Scaling this out will require partnerships with various actors governing both conservation and tourism, but show potential in rebranding Kodagu as not just a destination for coffee, but for responsible environmental stewardship as well.

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