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Research Article

STRUCTURAL TRANSFORMATION IN THE INDIAN COFFEE SECTOR: NEED FOR COPING WITH GLOBAL MARKET TRENDS

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Abstract- India, the sixth largest producer of coffee in the world has reached stagnation in productivity resulting in area led growth of production. A structural shift in Indian coffee production from high quality and premium priced Arabica coffee to lower quality Robusta coffee is evident and attributed to the prevalence of high incidence of pest particularly white stem borer in Arabica. Growers of Arabica are at disadvantage; incurring higher expenditure in cultivation to control the borer infestation and heavy economic loss in production. This shift is happening despite higher net returns realized by Arabica growers as compared to Robusta growers. It is imperative for India to increase the yield; particularly of Arabica coffee to remain in the quality segment of world coffee market as our analysis indicates that India's share has stagnated at around 4 percent. The paper also postulates that it is imperative to penetrate the niche market and in the process move from the conventional coffee production to a sustainable certification production systems in tune with the growing consumer recognition and demand for certified, organic and specialty coffee. The Coffee Board, the nodal agency for coffee research and development in India has to make concerted efforts in two direction;- (a) to break stagnation in productivity through technology and adopt strategies for arresting the decline in cultivation of Arabica coffee and; (b) focus on capturing niche markets by reorienting its efforts in the value chain.

Keywords- India, Coffee, Production, Productivity, Stagnation, Export, Niche markets

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Introduction

Coffee is the most widely traded tropical agricultural commodity with exports estimated at US$ 19.1 billion in 2012-13 [7]. Over 25 million small households depend on Coffee as a source of livelihood across the world [20]. Of the vast majority of coffee produced, over 3 tons for every 4 tons grown is exported, mainly from developing to industrial nations. Brazil (32.28 percent) and Vietnam (18.74 percent) are the major coffee producers in the world. India is the sixth largest producer and accounts for 3.85 percent of global share [Table-1].

Table-1 *Top ten coffee producing Countries in the world during 2014/15*

Country	Production in million bags (60 Kg)	Share in total production (percent)
Brazil	45.64	32.28.
Vietnam	26.50	18.74
Colombia	13.33	9.43
Indonesia	10.36	7.33
Ethiopia	6.63	4.69
India	5.45	3.85
Honduras	5.40	3.82
Uganda	3.74	2.65
Mexico	3.60	2.55
Guatemala	3.29	2.33
Others	17.43	12.33
Total	141.38	100

Source: International Coffee Organization (ICO)

Coffee cultivation in India is primarily a rural enterprise undertaken by 0.29 million growers mainly operating small farms (<10 ha). Besides, coffee sector provides direct employment for about 0.61 million workers [3] and indirect employment to a large number of people involved in its processing and trade. Coffee is traditionally cultivated in the three southern states *viz.,* Karnataka, Kerala and Tamil Nadu and on a limited scale in Andhra Pradesh, Orissa, West Bengal and Assam referred to as nontraditional areas. Karnataka is the leading coffee producer accounting for about 69 percent of the total Indian coffee production, followed by Kerala with 22 percent and Tamil Nadu 6 percent during 2013-14 [Fig-1]. As seen by the share in total production, commercial cultivation of coffee is not advancing as forecasted in nontraditional areas; production share increasing marginally from 2 percent during 2008-09 to 3 percent in 2013-14.

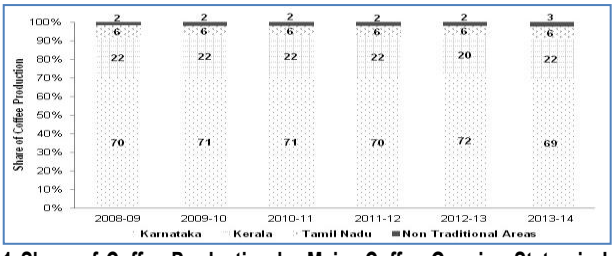

Fig-1 Share of Coffee Production by Major Coffee Growing States in India during 2008-09 to 2013-14 (percent)
Source: Coffee Board, India 2014.

In terms of trade, India is the third-largest exporter of coffee in Asia, and fifth-largest exporter in the world. Of the total coffee produced in India (2014-15), 66.94 percent is exported and 33.06 percent is consumed domestically. The total exports in the year 2015-16 is valued at 793.75 million USD [3] and the quantity of coffee exported from India is showing an increasing trend with small variations before and after liberalization [Fig-2].

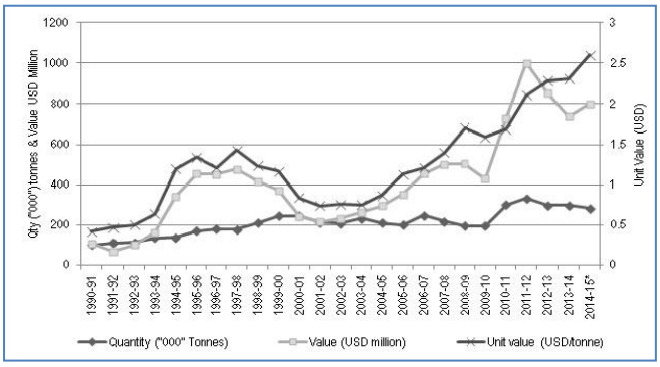

Fig-2 Trend in export quantity, value and unit value of Coffee, 1990-2013
Source: Coffee Board of India 2014

Prior to liberalization, Coffee Board had a virtual monopoly on purchase and sale of coffee grown in India. Growers were dissatisfied (as indicated during our survey) with the system of pooling coffee to the Board due to delayed cash payment, inefficiency in supply chain and not receiving the benefit of international prices. This situation forced liberalization of coffee sector [18]. The total value of coffee exports showed an increasing trend during the 1990s which tapered during 2000-05 period attributed to a decrease in Robusta prices by 39 percent in 2000 and 33 percent in 2001 that had a "domino effect" on Arabica prices, which were already under pressure due to 30 percent rise in coffee export from Brazil in 1999 [4]. The total value of exports started increasing from 2004-05 and reached peak during 2011-12 due to increased quantity of exports and unit value realization. In fact, export values increased from 731 million USD in 2010-11 to an all time high of one Billion USD during 2011-12. This is mainly due to 13.19 percent increase in Arabica and 20.20 percent increase in Robusta prices in the international market [3]. However, from the beginning of 2015 coffee exports have declined by 20 percent.

During the post liberalization period both quantity of coffee exported and unit value realized exhibited high degree of variability as witnessed by the high coefficient of variation [Table-2]. Besides, the unit value realization has been comparatively lower, particularly in 2001-02 to 2003-04 periods. In fact, the variability in unit value of export realization was higher in relation to quantity exported indicating high degree of volatility in export prices of coffee causing vulnerability to growers. Volatility ratio was calculated between value and quantity exported [14]. A ratio over 100 represents higher volatility. The table shows that, except for the period 1996-00, during all the other periods the volatility in value exported is greater than the volatility in the quantity of coffee exported from India.

Rationale for the study

Coffee, an export oriented crop earning a significant foreign exchange is experiencing drastic changes in its production. Currently, India produces 304.5 thousand tonnes of coffee spread over a bearing area of 381.30 thousand hectares. As the demand for coffee is growing at 2.5 percent per annum in the world market, the scope for expansion of production through area is limited as coffee requires a specified altitude, soil type and weather. Therefore, the growth in export demand has to be met with an increase in productivity.

Table-2 *Variability in Coffee Exports of India.*

Year	CV in quantity exported (%)	CV in total value of exports (%)	CV in unit value of exports (%)	Volatility ratio (CV value/CV quantity)*100
1990-95	13.78	69.50	57.51	504.35
1996-00	15.52	9.48	22.28	61.08
2001-05	7.54	11.98	14.26	158.89
2006-10	10.56	13.9	15.91	131.63
2011-14	5.55	14.34	9.54	258.44
1991-92 to 2013-14	29.92	58.33	39.47	194.97

Note: CV: Coefficient of variation, computation based on Coffee Board Statistics

However, coffee productivity in terms of bearing area in India (845.60 Kg/ha) is lower as compared to major coffee producing countries like Brazil and Vietnam. In fact, India's coffee yield is below the world average of 879.50 kg/ha. Thus, increasing the yield of coffee is a daunting challenge for India to meet growing global demands.

In addition, the global demand for quality coffee is increasing especially in the high quality Arabica segment. India exports coffee to countries such as Germany, Italy, Netherlands and other European countries where the per capita consumption of quality and premium coffee segments are high. However, the share of Indian Arabica, a superior coffee in terms of trade in total production has declined drastically due to biotic factors such as high infestation of white stem borer and abiotic factors as a result of erratic weather patterns in the coffee growing regions of India. It is in this context, the paper attempts to study the structural transformation occurring in the coffee production in India which is unfavorably altering the commodity export as presented in the following sections.

Materials and Methods

The analysis in the study used both primary and secondary data. The time series data on area, production and productivity of coffee were obtained from the various publications of Coffee Board, India. This paper used both primary and secondary data to analyze the state of India's coffee trade. Time series data on exports of coffee were obtained from the various publications of Coffee Board, India. Data on global coffee production were extracted from the publications of International Coffee Organization [7]. Information on certified and organic coffee production was supplemented from the publications of International Trade Centre (ITC), International Institute for Sustainable Development and the International Institute for Environment and Development. Tabular method was used to compile the data and simple statistical tool like averages, ratios, percentages and volatility ratio were computed to analyze the data. Compound annual growth rates were worked out to study the trend in exports of coffee over time. We assessed the performance of coffee exports during post liberalization period (1990-91 to 2013-14) using secondary data.

In order to understand the costs of coffee production a structured survey was carried out during the months of February and March 2013, covering 31 growers engaged in conventional cultivation. We followed a snowball sampling technique in our sampling frame. Tabular method was used to compile the data and simple statistical tools like averages, ratios, percentages and volatility ratio were computed to analyze the data. Compound annual growth rates have also been worked out to study the trend in area, production and productivity of coffee over time.

Exponential growth model is used for the analysis. The specific form of the model is:

$$Y = xw^t e$$

Where,

Y = Dependent variable for which the growth rate is estimated (Area/Production/Productivity of coffee).

x = Intercept; w = Regression coefficient
t = Time variable e = Error term

The compound growth rate was obtained from the logarithmic form of the equation as below

$$\ln y = \ln x + t \ln w$$

The percent compound growth rate (g) was derived using the relationship:

$$g = (anti \log w - 1)100$$

Trend in Area, Production and Productivity of Coffee in India

The area under coffee in India increased from 225 thousand hectares (ha) to 370 thousand hectares during the period 1990-91 to 2013-14 recording a growth rate of 2.56 percent per annum [Table-3]. During the same period, the production increased from 182 thousand tons to 310 thousand tons maintaining almost the same growth rate (2.50 percent) as that of area. However, the productivity of coffee showed a declined growth, especially during 2005-06 to 2009-10 period. As evident from [Table-3], the long term growth for the period 1990-91 to 2013-14 in productivity was negative (- 0.06 percent). Clearly, the growth in coffee productivity is stagnant or to be specific negative.

India ranks 24th in the world with respect to coffee productivity. The Food and Agriculture Organization [4] statistics reveals that the average yield of coffee in India is 845.60 kg/ha (2013), much lower as compared to Vietnam's yield of 2,499.10 kg/ ha and Brazil's 1,421.50 kg/ ha; the major producers [Table-4]. The lower yield in India is attributed to high pest infestation, low level of mechanization, and labour shortage [12]. In addition, heavy unseasonal rain and prolonged dry period have contributed for decline in productivity of coffee in India. The analysis shows production growth in coffee is area led rather than productivity or technology led mainly on account of increased area in non-traditional areas where the productivity levels are very low. Overall, productivity levels have not only been fluctuating but have reached a plateau. Further, the productivity gains has to come from the traditional coffee growing areas and this warrants a concerted policy action and the need to address concerns of sustainability in the traditional coffee growing areas [20].

Table-3 *Trend in Area, Production and Productivity of Coffee in India during 1990-91 to 2013-14 (five year average).*

Year/period	Area (in "000" ha)	Production (in "000" tons)	Productivity (Kg/ha)
1990/91-1994/95	225	182	809
1995/96-1999/00	278	243	872
2000/01-2004/05	323	285	883
2005/06-2009/10	347	275	793
2010/11-2013/14	370	310	836
CAGR (%)	**2.56**	**2.50**	**-0.06**

Note: CAGR: Compound Annual Growth Rate (1990-91 to 2013-14).
Source: Coffee Board, India 2014

Table-4 *India's Position in Yield of Coffee (Green) in the World during 2013.*

Rank	Countries	Yield of Coffee (Kg/ha)
1	Malaysia	2925.50
2	**Vietnam**	2499.10
3	Sierra Leone	2482.80
4	China	2355.40
5	Malawi	2191.90
6	Ghana	1551.10
7	Laos	1547.80
8	Tonga	1500.00
9	**Brazil**	1421.50
10	Paraguay	1299.30
24	**India**	845.60
	World	879.50

Source: Food and Agriculture Organization (FAO),2013.

Changing Pattern of Coffee Production in India: Moving from Superior Quality Arabica Variety to Inferior Robusta Variety.

Arabica (*Coffea arabica*) and Robusta (*Coffea canephora*) are the two major varieties of coffee grown globally. Arabica coffee is typically grown in higher altitudes ranging from 600 to 2000 meters in cool, moisture-rich and subtropical weather conditions. While, Robusta is grown in lower elevations with less shade. In the market, Arabica coffee is distinctly considered as a superior coffee because of its quality parameters such as aroma, flavor, body and acidity [6].

Changing patterns of bearing area, production and productivity of Arabica and Robusta coffee are presented in [Table-5]. The area under Arabica cultivation increased from 109 thousand hectares in lustrum ending 1994-95 to 171 thousand hectares in 2013-14, increasing annually at the rate of 2.21 percent. As stated earlier, the increase in bearing area under Arabica is mainly due to expansion of its cultivation in non-traditional areas. During the same period, the production of Arabica coffee increased from 83 thousand tons to 99 thousand tons registering a positive compound growth rate of 0.54 percent per annum. However, it is pertinent to note that the productivity of Arabica coffee declined from 769 kg/ha in 1990/91-1994/95 to 578kg/ha in 2010/11-2013/14 (a decline at the rate of -1.63 percent per annum).

Table-5 *Changing Trend in Area, Production and Productivity of Arabica and Robusta Coffee in India during 1990-91 to 2012-13 (five years average).*

Year/period	Bearing Area (in "000" ha)		Production (in "000" tons)		Productivity (Kg/ha)	
	Arabica	Robusta	Arabica	Robusta	Arabica	Robusta
1990/91-1994/95	109 (48)	117 (52)	83 (46)	99 (54)	769	847
1995/96-1999/00	133 (48)	145 (52)	102 (42)	141 (58)	767	968
2000/01-2004/05	149 (46)	174 (54)	107 (38)	178 (62)	717	1025
2005/06-2009/10	154 (44)	193 (56)	92 (33)	183 (67)	598	950
2010/11-2013/14	171 (46)	199 (54)	99 (32)	211 (68)	578	1058
CAGR (%)	**2.21**	**2.88**	**0.54**	**3.76**	**-1.63**	**0.86**

Notes: (1) CAGR: Compound Annual Growth Rate (1990-91 to 2013-14).;
(2) Figures in parentheses are percentages to the total
Source: Coffee Board, India 2014.

In case of Robusta, production increased from 99 thousand tons in the lustrum ending 1994-95 to 211 thousand tons during 2013-14 representing a growth of 3.76 percent per annum. Similarly, the bearing area under Robusta coffee increased from 117 thousand hectares in the lustrum ending 1994-95 to 199 thousand hectares in 2013-14 which translates in to an annual increase at the rate of 2.88 percent. Unlike, in Arabica, the productivity in Robusta during the corresponding period increased from 847 kg/ha to 1058 kg/ha with a compound annual growth rate of 0.86 percent.

Thus, increased area coupled with improved productivity has contributed to higher production and consequently increased share of Robusta coffee in India. However, a reverse trend is witnessed in Arabica – a superior coffee in terms of trade. The share of Arabica in total coffee production has drastically decreased from 46 percent in lustrum ending 1994-95 to 32 percent in 2013-14 [Table-5]. The decreasing share of Arabica is attributed to the shift in cultivation towards Robusta adopted by the coffee growers particularly in traditional areas due to persistent risk of white stem borer and climatic factors such as erratic distribution of rainfall as expressed by all Arabica growers during our survey (details of survey can be found in [1]). It is evident from [Table-5] that the share of area under Arabica decreased from 48 percent in lustrum ending 1995 to 46 percent in 2014. Due to the biotic and abiotic stress factors the Arabica yield witnessed a decreasing productivity from 769 Kg/ha in lustrum ending 1995 to 578 kg/ha in 2014 which undoubtedly has contributed to the shift towards Robusta coffee.

The survey results further indicate that Arabica growers have uprooted and burnt (the recommended practice) 20 to 100 Arabica plants per acre in the last two years due to heavy infestation of white stem borer. The widespread and persistent pest infestation has been the primary factor that has forced coffee growers to convert their area into Robusta coffee which is comparatively resistant to diseases and pests. All Arabica growers respondents equivocally expressed the failure of Coffee Board in terms of Research and Development (R & D) to find a solution to combat the problem of white stem borer. This has serious implication for India's exports as more Robusta coffee is being exported with the decline in Arabica production , resulting in decreased export of quality coffee and unit value ($/Kg). Providing technology support to combat the problem of white stem borer and encouraging growers to sustain Arabica coffee production is necessary to remain in the quality segment of the international market.

A dipstick analysis of the economics of Arabica and Robusta production has also been attempted to examine whether the net returns are contributing factor to a shift in coffee production. The estimates of costs and returns provided in [Table-1] indicate cost of production of Arabica is higher as compared to Robusta coffee. The production costs of Robusta worked to Indian Rupee (INR) 32,662/acre while Arabica growers incurred a cost of Rs.39,561/acre. As coffee production is labour intensive, it formed a major component; 60 percent and 65 percent of the total cost of Arabica and Robusta, respectively. The non-availability of labour during peak seasons for operations like pruning, weeding, shade regulation and harvesting [22] further increases the cost. In general, wage rate in the leading coffee producing state - Karnataka has increased from INR.142 to INR.228 per day between April 2012 to September 2014 [3] resulting in 61 percent rise in wage rate. Declining coffee yield especially in Arabica is another reason for increased cost of production. Arabica being susceptible to higher incidence of pest and disease, these growers experienced steep costs on plant protection chemicals amounting to Rs.1972 per acre. Also, the yield of coffee realized by Arabica growers (616 Kg/ac) is lower as compared to the Robusta growers (672 kg/ac) and is mainly attributed to the high infestation of white stem borer resulting in removal of affected plants. Moreover, non-availability of labour at critical period of the crop added to the problem of Arabica growers. During our survey, it was indicated that the Arabica growers uprooted 20 to 100 plants per acre causing a substantial yield loss. However, since Arabica is a superior coffee, it fetches a higher price (Rs 160/kg) as compared to Robusta at Rs 120/kg and therefore Arabic growers realized a higher net return of Rs 59,252 per acre as compared to Rs 47,779 per acre realized by the Robusta growers. It is interesting to note that in spite of higher net return realized by the Arabica growers, they preferred converting their Arabic area into Robusta mainly due to the devastating effect of white stem borer infestation resulting in an uncertain future. They are convinced that such risks are minimal in Robusta and therefore preferred shifting their cropping area gradually from Arabica to Robusta which has had repercussions on the global market share of Indian Coffee elucidated in the following section on coffee exports.

Table-6 *Costs and returns of coffee production (Rs. /ac.)*

	Arabica Parchment		Robusta Cherry	
Items	Input costs	Percent of total costs	Cost/Return (Rs./acre)	Percent of total costs
Labour	23,657	59.80	21,294	65.20
Fertilizer	7,798	19.71	7,107	21.76
Plant protection Chemicals	1,972	4.99	602	1.84
Primary processing	3,200	8.09	637	1.95
Irrigation	2,933	7.41	3,022	9.25
Total Cost	39,561	100	32,662	100
Average Yield (kgs of clean coffee)	616		672	
Average price (Rs./kg of clean coffee)	160		120	
Gross Returns	98,817		80,440	
Net Returns	59,252		47,779	
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	

Source: Computed by the authors based on data obtained during fieldwork conducted during February-March 2013.

Stagnant Market Share of Indian Coffee in Global Market

The analysis of India's export share in total global exports based on 20 years (1993 to 2012) data presented in [Table-7] indicates that India's share in total global exports has been hovering around 4 percent. Thus, India is a minor player in the world coffee market. For instance, Indian Arabica is under "other milds" while Brazil (Brazilian milds) and Colombia (Colombian milds) have their own niche. India's share in the global market is stagnant despite the fact that the exports have grown at 1.97 percent per annum. India is not able to keep pace with world export growth rate of 2.20 percent per annum as the country is not able to meet the changing market demand in terms of quality, consumer preference for certification and form (instant, roast and ground). A closer examination of recent five year total exports of all forms of coffee (including instant, roast and ground coffees) and export share reveals that Vietnam has substantially increased its share while Colombia and Honduras are slowly but steadily increasing their share. India exported a record 5.41 million bags in the year 2011 resulting in a global market share of 5.18 percent. However, in the following years, exports reduced to 5.03 million bags resulting in India being relegated to the seventh position [8].

India's coffee turns costly for the major consuming countries in the world compared to Brazil and other regions, mainly due to high prices which have made shipments uncompetitive in the global market as buyers are looking for cheaper coffees [12,13]. India is mainly exporting its coffee to few countries in Europe. Italy is the major (23.91 percent) and stable export destination for Indian coffee [Table-8]. Italians prefer strong and rich coffee blends from India, especially Robusta, as it is suitable in their own espresso blends. Germany is the second largest importer

followed by Russian Federation, Belgium and Spain.

Table-7 *India's Share in Global Coffee Exports (in "000" bags)*

Year	World	India	India's share (%)
1993/94-1997/98	74638	2942	3.94
1998/99-2002/03	88931	3836	4.31
2003/04-2007/08	91536	3538	3.87
2008/09-2012/13	102484	4331	4.19
CAGR (%)	**2.20**	**1.97**	

Note: CAGR: Compound Annual Growth Rate (1993-94 to 2012-13)
Source: Coffee Board of India, 2014.

Thus, India's export destinations are few and not able to penetrate the premium markets segments in USA and other European countries. The fact that Indian Coffee does not have its own niche and is blended with coffee produced by other major producers necessitates creating our own brand based on the country's ecological niche which is elaborated in the next section.

Table-8 *Main Export Destinations of Indian Coffee: 2009-10 to 2014-15 (in tonnes).*

Country	TE 2011-12	TE 2014-15
Italy	66243 (23.97)	70203 (23.91)
Germany	28227 (10.22)	27386 (9.33)
Russian Federation	30191 (10.93)	21081 (7.18)
Belgium	14605 (5.29)	16599 (5.65)
Spain	10221 (3.70)	6153 (2.10)
Others	126837 (45.90)	152166 (51.83)
Total	276324 (100)	293587 (100)

Note: Figures in parentheses are percentages to total.
Source: Coffee Board of India, 2014.

Trends in Indian Coffee Exports (shipments) by Types (grades)

Analysis of Indian coffee exports by types (grades) is attempted by considering actual shipments of major grades. Exports of Arabica grades *viz.* plantation and Arabica cherry recorded a negative growth rates of 1.60 percent and 1.27 percent respectively for 2003-14 period [Table-9]. While, Robusta grades; namely, Robusta parchment and Robusta cherry showed a positive growth rates of 1.01 percent and 2.89 percent respectively. However, recent data indicate that Robusta cherry, which constituted a major share of Indian coffee exports, has also dropped by 19 percent in quantity terms between January to September 2014 [10]. Indian Robusta exports declined, as Vietnam, the largest producer of Robusta coffee has been able to sell at lower prices in the international market [11]. In the most recent period, from the beginning of 2015, Arabica exports drastically fell by 50 percent, pulling down the overall coffee exports by 20 percent which is mainly due to lower production, high domestic prices and cheaper Arabica supply from Brazil [11]. As pointed earlier, the shift in cultivation from Arabica to Robusta coffee has affected India's exports. Due to reduced productivity and production of Arabica coffee, India is forced to export more of Robusta which commands a lower price in the international market. Consequently, India is moving from a higher quality segment to a lower quality segment in the world coffee market.

Table-9 *Coffee Exports from India by Types (three years average in tonnes)*

Year	Plantation (Arabica parchment)	Arabica Cherry	Robusta Parchment	Robusta Cherry	I+ R +G
2003-05	45,735	12,372	21,285	88,014	50,740
2006-08	39,224	11,027	21,153	93,549	59,030
2009-11	32,895	11,383	25,540	1,19,582	71,918
2012-14	40,149	10,781	22,906	1,13,472	76,356
CAGR (%)	**-1.60**	**-1.27**	**1.01**	**2.89**	**4.87**

Notes: (1) CAGR: Compound Annual Growth Rate (2003-04 to 2013-14);
(2) Includes re-exports from 2004 onwards; I+R+G: Instant+ Roasted+ Ground.
Source: Coffee Board of India, 2014.

Interestingly, exports of instant, roasted and ground coffee have increased by 4.87 percent per annum during 2003-14 period. In the past decade, the world demand for instant coffee has expanded at an annual growth rate of 7 to 10 percent [5]. India exploited this opportunity and emerged as the second largest exporter of Instant coffee in the world (next to Brazil) and accounted for about 12.6 percent of world's exports [7]. In quantity terms, India's instant coffee exports increased from 43,691 tonnes during 2002 to 78,217 tonnes in 2013 representing a 79 percent increase. Russian Federation, leading importer of Instant coffee in the world is also the major importer of Indian Instant coffee followed by Finland [3].

It is estimated that 100 million bags or 76 percent of all coffee consumed in the world (including that consumed in producing countries) is in roast and ground form [20]. Unfortunately, India exported only 205 tonnes of roast and ground coffee during 2013 [3] revealing the inability of the country to avail the trade opportunities in the roasting sector. Currently, importing countries are dominating this market and making huge revenues. India has all the potentials of emerging as a major exporter of roast and ground coffee, if the problems are properly addressed. In India, most of the roasters are small and still using conventional drum roasters with different roasting capacity, resulting in inferior quality of coffee due to common roasting errors like scorching, baking and not maintaining uniformity. This is followed by the grinding process and small roasters use "flour mill/ mill stone" type grinders. These grinders break the roasted beans mechanically into small parts of varying sizes that lack uniformity. Often, this type of grinding generate more heat which affect the coffee flavor. These result in causing technical trade barriers that diminish the export opportunities for India and offset the gains from trade liberalization. The problem in roast and ground sector needs to be tackled in two ways. Firstly, by providing assistance to small roasters for improving their technology in coffee roasting/ grinding to enhance quality of coffee. Secondly, by capacity building through training programs on international quality standards (e.g. use of metalized polyester and polypropylene instead of polyethylene as packaging material) for coffee roasters, which is essential to improve the shelf life of the coffee as it begins to lose its flavor in 2-3 weeks post roasting of the coffee beans – even shorter, if the coffee has already been ground.

Sustainable Coffee Certification to Improve Global Market Share

The demand for standard compliant[2] - certified and labelled coffees has risen substantially in major coffee importing countries in North America and Europe [20]. This demand comes from a growing and informed consumer concern for social, environmental and health impacts of agriculture commodities produced and distributed. Coffee retailers and manufacturers have also been promoting sustainability as a cause-based marketing strategy and means of achieving corporate social responsibility objectives. As of 2012, global sustainability standards compliant coffee production accounted for 40 percent, up from 15 percent in 2008 [17]. The growth rate for certified coffee have varied between 20-25 percent per annum compared to just two percent for conventional coffee. It is also observed that certified coffees have realized market shares of over 10 percent and 40 percent in Scandinavia and Netherlands markets respectively [16]. With certification, it is expected that coffee producers and exporters can bargain for better realisation in the supply chain. Traders believe that conformity with sustainability standards will in fact become a requirement for entry into international markets, whereby, it links social responsibility with market capitalism. India lags far behind in sustainable coffee certification [9]. In India, production and market for certified and organic coffee is expanding at a slow pace due to the lack of champions to promote such ventures and low premiums realized by the producers [2].

The global production share of India's certified coffee is 2 percent and organic coffee, a meager 1 percent. Based on certification labels, as of 2012, India produced 5.2 percent under Fairtrade, 3.4 percent under Rainforest Alliance, 10 percent under UTZ certification and 0.4 percent under Organic [17]. India offers great scope for production of organic coffee, as it is bestowed with favorable agro-climatic regions and is seen as a viable business model for small coffee growers.

Opportunities for Penetrating Niche Coffee Markets

Indian coffee being primarily grown in the Western Ghats, one of the 10 hot spots of biodiversity in the world, is by default a shade grown coffee under various agro forestry systems with high species diversity. However, the same has not been exploited in the absence of efforts for certification and labeling. Certification would provide both incentives to conserve biodiversity as well as exploit niche markets such as "Shade Grown" or "Bird Friendly" coffees which command high market premium. India has all the potential to scale the market in terms of specialty coffee [Fig-3], where a growing number of consumers are prepared to pay a higher price for single origin high quality coffee. For example, estate branded specialty's that have made inroads into the international market are "Buttercup Bold", "Balanoor Bean", "Meerthi Mountain" and "Horseshoe Heights" to name a few [19].

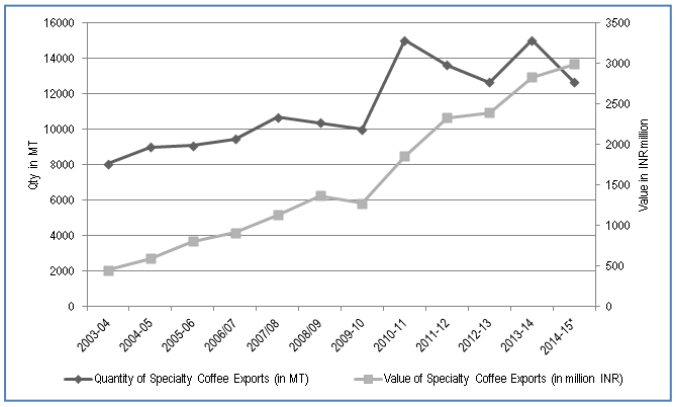

Fig-3 Export of Indian Specialty Coffee (2003-04 to 2014-15)
Source: Coffee Board of India, 2014.

Our attempt to understand the causes for slow growth of certified and specialty coffee; relate to a plethora of co-existing labeling standards and their multiple criteria imposed on the Indian coffee growers creating a disadvantageous platform for the sector. The impact of certification on farmers' welfare is complex, as production intensity, variability in prices and production costs vary widely in conventional and organic certified coffee. For example, incremental costs incurred by coffee growers to comply with these multiple eco-labeling criteria and regulations do not often correspond with a resultant increase in revenue realization [23]. While certification and sustainability norms require producers to maintain or increase shade cover, it often results in lower yields, which is problematic in the context of addressing rural poverty given a majority of coffee growers are small farmers [24]. Farmers facing lack of consistency in distribution of premiums on certified and organic coffee [1,2]. Also, prices for organic certified coffee often do not compensate for low yields and long conversion period. The sustainability initiative within the coffee community in India is also seen as a neo-imperialist agenda of increasing control by consumer countries over producer supply chains [15]. Therefore, one of the avenues to garner increased production of sustainable coffees and subsequently sustain Indian global market share is adoption of innovative certification schemes that improve yield rather than solely concentrate on price premiums. These schemes should setup specific criteria tailored to the local context, for e.g. valorise the endemic forest-tree diversity in coffee farms of India and market the unique products that originate from these agro forestry landscapes as value addition. Such efforts will enable India to penetrate the niche coffee markets that are desirable for alleviating Indian coffee grower's welfare and increasing net cash returns in a volatile international market.

Summary

The structural change in Indian coffee production is visualized in three ways. Firstly, the analysis of long term data on coffee production indicated an area led growth as the productivity of coffee has shown a negative growth, especially during the recent period. Stagnation in productivity growth is evident in Arabica coffee while a positive growth in productivity is witnessed in Robusta. The stagnation in yield of Arabica coffee is a complex issue caused by the adverse affects of the white stem borer and increasing cost of labour and weather aberrations. Secondly, most of the Arabica growers are steadily switching over to the Robusta coffee which has resulted in decreased share of Arabica in the total production. This is a conscious move adopted by the coffee growers particularly in traditional areas mainly as a strategy to combat the biotic and abiotic stress factors causing high risk in Arabica production. Clearly, the preference of growers is for Robusta coffee which is comparatively resistant to diseases and pests.

Thirdly, a decline in Arabica production will lead to more export of Robusta coffee, resulting in decreased exports of quality coffee and unit value ($/Kg) realization. As it is, India is not able to keep pace in the world market as our annual export growth rate of 1.97 percent, is lower than the annual growth of world coffee export demand at 2.20 percent. The share of Indian coffee exports to total global coffee exports has almost remained stagnant at around four percent for a long time. In our effort to capture higher earnings from trade, we are gradually resorting to export of more quantity albeit limited success given the low prices of these bulk coffees. It is imperative for India to move from conventional production to sustainable coffee production to capture high value markets which can act as growth drivers for Indian coffee exports in the coming years. It is necessary for the Coffee Board to proactively address the issue of white stem borer infestation as well as incorporate sustainable coffee certification as a part of their technology transfer program so that growers adopt them and are able to realize higher returns. Thus, providing technology support to combat the problem of white stem borer and encouraging growers to sustain Arabica coffee production is necessary to remain in the quality segment of the international market.

India is currently not able to keep pace with the world export growth of coffee and as such the share of Indian coffee exports to total global coffee exports has remained stagnant at around four percent for long time. It is imperative for India to penetrate the niche market by meeting the growing consumer recognition and demand for certified, organic and specialty coffees. Consumers in the premium markets, the United States and European Union (EU) are moving towards certified and organic coffees but India is yet to penetrate these niche markets effectively. To keep pace with the global market trends, it is essential for India to move from conventional production to certified, organic and specialty coffee production to capture these high value market segments so that it can act as growth drivers for Indian coffee exports and help in sustainable management of ecological resources. Estate brand specialty coffees is another avenue that is developing a niche for itself and roasters are hand picking estates that produce specialty coffee, thereupon, roast and sell them under their brand. With a global production share of only two percent of certified coffee, India has vast opportunity to expand its standard compliant coffee production taking into cognisance context based socio-economic and ecological factors. The Coffee Board, the nodal agency for coffee research and development in India continues to engage in supporting conventional coffee farming without much serious efforts to reorient the supply chain to meet the emerging demand in international markets. The Board needs to incorporate sustainable coffee certification as a part of their technology transfer program so that farmers adopt it and realize higher returns. Similarly, the other stakeholders in the supply chain such as curers, exporters, certifying agencies and roasters need policy support to adopt global practices to push Indian coffee in the global market.

Notes:

[1]Large multinationals like Kraft foods, Sara Lee/DE and Nestle are the key players in roast and ground coffee markets.

[2]Standard compliant coffee refers to coffees that are labeled, certified, fairtrade, organic or a combination of any of these labels based on a set of standards maintained in its production for quality management and sustainable sourcing.

Conflict of Interest: None declared

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