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**21**

**ASSESSING RISK AND RISK MITIGATION  
STRATEGIES OF SMALL COFFEE GROWERS:  
A STUDY OF KODAGU DISTRICT IN  
KARNATAKA**

**Deepika M. G.  
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## **ABSTRACT**

Coffee in India is largely grown in the southern part of the country and involves small growers. Small holding cultivation combined with the external reliance for markets have posed risks to coffee cultivators at different levels. In this context, the paper analyses various risks among the small coffee growers in India through the study conducted in the Kodagu district of Karnataka, the largest coffee growing district in India. The risks that are analysed are classified into farm risk arising due to threat to yield, rising cost of inputs, lack of irrigation and extension services and marketing risks arising due to volatility of prices and the buyer driven supply chain; policy risks arising due to taxation and other regulatory barriers. Among these, the risks stemming from threat of diseases, attack of wild animals, rising labour cost due to shortage of labour, exploitative marketing situations arising due to lack of co-operatives are matters of serious concern and call for urgent policy interventions, which if properly addressed might help in mitigating some of the risks faced by the farmers. To mention some of them, there is an urgent need to enhance the R&D efforts of Coffee Board and Spices Board to address on the kind of pest attack on coffee and other crops in the region. There is a need for transferring the technology at the field level through arriving at efficient extension services. Intervention by forest officials in addressing the problem of wild animals is an immediate requirement. Shortage of labour being the most crucial of the input problems, there is an urgent need to move towards cost effective and crop specific mechanisation. Linking of MNREGS for plantation labour could provide some relief to the problem of labour shortage. A relook into the Plantation Labour Act to make it advantageous to both the farmers and the labourers is called upon to lead to more organised labour market. To address the marketing risks, a seller driven supply chain would be useful in resisting the price related risks associated with the growers. Exploring the possible alternatives in terms of coffee marketing co-operative or local auction market can help creating a seller

led supply chain process. The other way to minimise risk would be to promote crop diversification by the existing Boards. From the analysis of diversification at the regional level using secondary information on price and yield, it is visible that coffee and other intercropped commodities have different price and yield cycles, and therefore, diversification of crops would act as a hedge against price and yield risks. It is therefore, important to promote diversification of crops at farm level. Attempts made to address crop related issues by Coffee Board, Spice Board and horticulture department hardly encourages diversification. It is essential that these Boards work in tandem to promote diversification of crops in the region looking into the problems of farmers in totality.



## **1. Introduction**

Coffee cultivation in India, like in many parts of the world, is carried out by small and marginal cultivators. Small holding cultivation combined with the external reliance for markets have put coffee cultivators to risk at different levels. As a production system, coffee cultivation is highly labour intensive. Farm labour in coffee plantations requires a particular set of skills. With limited options of mechanisation and growing labour shortage, coffee production is exposed to a high level of farm risk. Since coffee is a globally traded commodity, the producers are often the victims of volatility in global prices caused by supply-demand disequilibrium. Increasing cost of production and narrowing profit margins have triggered migration of people from this sector to other professions. The regulatory environment having undergone a change, coffee producers are increasingly exposed to the vagaries of market forces, in contrast to secured environment of regulated marketing (Hartmann and Akarsha, 2009).

Coffee in India is largely grown in the southern states of Karnataka (70%), Kerala (20%) and Tamil Nadu (7%). Small growers (below 10 hectares) dominate the coffee sector both in terms of number of holdings and production. Over 98% of coffee holdings and 70% of coffee production in India is by small holders. About 77% of holdings are classified as tiny (below 2 hectares) holdings (Upendranadh, 2010). Hence, it is a major source of income for small and marginal planters as well as plantation workers. Coffee cultivation in India assumes importance not because it provides foreign exchange through exports but also from the perspective of livelihoods of large number of small growers and plantation workers.

This paper maps the risks faced by coffee growers in India with a focus on small coffee growers in the region of Kodagu district in Karnataka. The nature and extent of risks are assessed in the region along with the coping strategies adopted by the growers. The paper also examines the amount of diversification among the coffee cultivators in the coffee growing region of Kodagu and addresses some issues relating to diversification and its role in hedging risk in coffee cultivation.

## **2. Objectives of the Study**

- a) To examine and map the risks - farm risk, marketing risk, and other risks faced by small coffee growers and identify the variables influencing them.
- b) To assess the current risk management approaches adopted by farmers and other stakeholders related to coffee cultivation.
- c) To examine the extent of crop diversification among small coffee growers and examine if diversification would be a means to hedge some of the risks associated with coffee cultivation.

## **3. Data Source and Methodology**

The study is based on both primary and secondary sources of data. The secondary sources of information include *Kodagu District Statistics* published by Government of Karnataka, data obtained from the Food and Agricultural Organisation, information from Coffee Board of India and Spices Board of India and the earlier literature in the area. Primary data were collected from some regions of Kodagu district of Karnataka which is one of the largest coffee growing districts of the country. Focus group discussions were conducted with small farmers in Gaalibeedu and Katekeri villages in Kodagu district and individual interviews with small and a few large farmers in Madikeri and Somwarpet regions. Information on farm gate prices, area under different crops, yield of coffee and related crops, income, cost of production, input related information, especially, that of labour, marketing and information

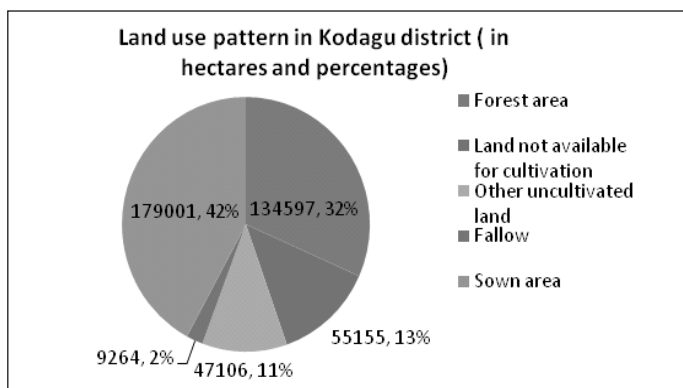


about the functioning of Coffee Board and Spices Board were gathered. Farm and marketing risks faced by the farmers in the region were assessed and documented. Interviews were conducted with the Secretary of Coorg Planters' Association, Coffee Board Officials in Madikeri and a few curers and exporters located in Kushalnagar region. Reasons behind the lack of efforts or constraints faced in moving up the value chain for coffee producers are analysed. Diversification of crops is measured using the Herfindhal's Index from the acreage information on different crops using data from Kodagu District Statistics. Issues pertaining to diversification of crops in the farm level and constraints before farmers towards diversification are analysed based on field observations. Trends in prices and yields of different crops are examined to assess if diversification of crops would help in hedging price and yield risk. However, the study is based on preliminary observations from the field along with secondary data and is largely exploratory in nature.

#### 4. Brief Profile of the Study Region: Kodagu District in Karnataka

Kodagu, a district in Southern Karnataka, is known for its diverse agro-climatic conditions. The district is divided into three Talukas -

**Fig 1: Land Use Pattern in Kodagu District**

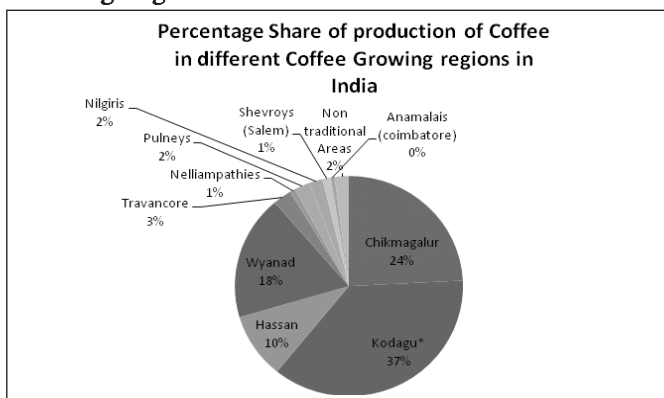


Source: Kodagu District Statistics at a Glance: 2009-10, Government of Karnataka

Madikeri, Somwarpet and Virajpet each distinct in its topography. The coffee agro forestry system of Kodagu is one of the richest agro forestry systems in the world, with about 270 species of shaded tree varieties (Coffee Board of India, [www.indiacoffee.org](http://www.indiacoffee.org)).

Almost 86% of the population of the district is rural. Only 12% of population depends on agriculture for its livelihood as cultivators or labourers. A wide variation in the crops cultivated and its yields is experienced. Coffee, paddy, maize, chilli, ginger, pepper, arecanut, banana, orange, cashew, coconut and rubber are the main crops grown in the region. During 2008-09 around 1,78,479 hectares (ha) of land was cultivated under different crops. Almost 43.7% of agricultural holdings is marginal (0-1 ha), 22.35% is small holders (1-2 ha), 18.4% is semi medium (2-4 ha), 12.2% is medium (4-10) and only 3.24% of the holdings is large with above 10 ha. Of the total land area which spreads to around 4,10,775 ha, 43% of the land is net sown, 32.7% is covered by forest land and the remaining area is not suitable for cultivation. Coffee is the predominant crop of the region occupying around 57.5% of the gross cropped area, followed by paddy (19.8%), cardamom (5.06%) and pepper (4.9%). Around 30 other crops are grown in the region, though in small

**Fig 2: Percentage Share of Production of Coffee in different Coffee Growing Regions in India**



Source: Coffee Board of India, Statistics, 2012.

proportions. The geographical diversity of the region is suitable for cultivation of wide variety of crops. (Kodagu District Statistics, 2009-10).

Kodagu district stands out as a major coffee producing district among the plantation districts of the region with 53% of coffee production in Karnataka (38.5% of All India). Though Arabica and Robusta varieties are grown in the region, Robusta has a larger share.

Total area under Arabica Variety is around 26,000 ha and Robusta occupies 56,000 ha. Almost 73% of the crop produced is that of Robusta variety. Average production of Arabica and Robusta in the region is around 21,800 and 93,225 MT respectively. There are indications that productivity of Robusta variety has increased over time while productivity of Arabica has declined. Coffee is grown with other crops in the region like pepper, cardamom, cocoa, orange, vanilla, banana and arecanut. 98.8% of holdings in coffee in Coorg is classified as small by Coffee Board (less than 10 hectares) who contribute to 70% of production and 1.2% of holdings are large contributing to around 30% of total production. 2,54,628 people are employed in coffee plantations as of 2009-10 (Coffee Board of India, 2012).

## **5. Risks and Risk Mitigation Strategies in Coffee Cultivation: A Review**

Upendranadh and Subbaiaha (2012) have analysed coffee growers' situation and the problems faced by them in Kodagu district of Karnataka. They attribute the problem of low price realisation by the farmer to the supply chain in coffee dominated by the MNCs. Their study reveals that the value accrued to the primary producer has consistently declined over a period. In the value chain analysis of coffee marketing in India, Venkatesh, (2011) shows the lack of vertical integration in the supply chain of coffee. It is clearly seen that coffee markets in the world are concentrated and are oligopolistic in nature. The study also brings in the nuances of the coffee marketing at a micro level in Kodagu region.

The study observes that while there are market led mechanisms available to address fluctuations in prices, they are not being adopted by small growers due to several reasons including costs of entry and lack of awareness about such mechanisms. Another aspect the study highlighted is the absence of co-operative system to push for more demand of quality coffee from the region.

Liberalisation was expected to bring clear benefits to producers from the introduction of more efficient markets, but, alas, it also gave rise to new problems by exposing producers to the vagaries of the market. In particular, concerns have been raised that as a consequence of liberalization, producers have become exposed to high volatility of coffee prices, which exposes them to high levels of price risk and, therefore, significant amount of income risk, if coffee is their sole or main cash crop (Subervie, 2008). This poses a greater challenge for small producers in view of their limited ability to hedge or diversify their price risk exposure. India is a small producer and exporter as far as world production and export of coffee is concerned. India's share in the world production and export are below three per cent and India in no way can influence the world prices ([www.fao.org/statistics](http://www.fao.org/statistics)). Given the small producer status of India, the world prices can be taken as given. Coffee future prices too have been quite volatile in the last decade. There are many factors that contribute to these unstable and high volatile prices. Coffee output is highly vulnerable to weather shocks (Lewin et al., 2004). Baffes (2007) claimed that crude oil prices affect the price of agricultural commodities on the supply side, as it enters in the aggregate production function through the use of various energy inputs (fertilizer and fuel) and in the transportation process of these goods. Since the entry barriers for coffee imports in India is very low, it makes it unpredictable for growers to take decisions related to production.

A study by World Bank (2010) makes a risk assessment in the Haiti Coffee supply chain, the vulnerability of farmers to those risks and

the priority measure for risk management. The methodology is referred to as the Rapid Agricultural Supply Chain Risk Assessment (RapAgRisk) and is designed to examine and quantify major risks along with specific agricultural supply chains. RapAgRisk provides a conceptual framework and set of detailed guidelines for conducting a system wide assessment of risk, risk management and vulnerability within agricultural supply chains. The study categorises the risks in the Haitian coffee supply chain into three - production risks, marketing risks and other risks. Factors contributing to production risks are identified as pests affecting the yield, hurricanes, excess rain, old age of plants, etc. Market risks are identified as international coffee price volatility, exchange rate appreciation, steep increase in interest rates, fall in domestic consumption, exporters default on loan, contract failure, transportation blockage due to damaged roads, co-operative failure and other risks like political and labour risks. Risks are summarised on a matrix based on severity v/s probability of occurrence of the events based on qualitative information. A measure for risk management framework is provided for each of the identified risks.

It is seen that some countries have also successfully developed other activities such as non-agricultural commodities or light infrastructure. For instance, Columbia's dependence on coffee exports has significantly decreased over the past decade due to the development of Oil industry. But such a diversification requires a good industrialisation policy. Therefore, diversification within the sector needs to be achieved. Sustainable sources of employment have to be found in this sector to reduce the higher incidence of poverty in rural areas and prevent further urbanisation. An example of this also comes from Kenya during the early 1990s where diversification programmes to increase production of fruit, vegetables and flowers met with considerable success (World Bank, 2010). A review of risk mitigation strategies and experiences from such strategies of some of the coffee growing regions would be useful in recommendation of plausible risk mitigation of strategy.

Diversification in agriculture can mean any of the three situations: 1) a shift from farm to non-farm activities, 2) a shift from less profitable crop to more profitable crop, 3) using resources in diverse but complementary activities (Vyas, 1996). The first type of diversification is essentially the diversification of rural economy. The second type can be viewed as a farmer's response to relative price signals to adjust to market conditions. The third type refers to efficient allocation of resources. The broad rationale for crop diversification emanates from the opportunities it offers to reduce production and price risks, increasing yields, natural resource sustainability, maintaining ecological balance, increasing flexibility and sustain productivity and growth. It also creates opportunities for more employment and higher income through more efficient use of resources and exploitation of comparative advantage (World Bank, 1990). However, one aspect of diversification which seems to be less examined is the assessment of real risk hedge achieved by Indian farmers through adopting the strategy. Diversification which merely increases the return without minimising risk is blind diversification (Luenburger, 1998).

Mukherjee (2010) explores the relationship between crop diversification and risks in India. Herfindhal's index has been used to analyse the level of crop diversification across major states over the study period. The study makes an effort to compute yield risk and price risk of each states using Markowitz's Mean Variance Theory and map it with the crop diversification for the corresponding states. It is seen that while the relationship is positive in the case of crop diversification and yield risk, they could not conclude the relationship between crop diversification and price risk. Accounting for the existence of uncertainty and the attitude towards risk would help in better comprehension of the cropping decision.

The essence of the Mean Variance Theory developed by Harry M Markowitz (1952) and extended by Linter (1965) and Sharpe (1970)

lies in the fact that as a general rule, the variance of the return of a portfolio can be reduced by including additional assets. Portfolio is defined simply as a combination of items, securities, assets or other objects of interest. Portfolio theory is used to derive efficient outcomes, through identification of a set of actions, or choices that minimise variance for a given level of expected returns, or maximise expected returns given a level of variance. Decision makers can then use the efficient outcomes to find expected utility-maximising solutions to a broad class of problems in investment, finance and resource allocation (Robinson and Brake, 1979). Simply stated, portfolio theory although developed in the context of financial assets, the concept can be borrowed in a wide variety of settings and choice made under uncertainty and associated with risk, even in case of crop selection. The application of portfolio theory for conceptualising crop selection decision is well demonstrated by Barkley and Peterson (2008), Toledo and Engler (2008), Gemech et al (2009) and Akca and Sayili (2005).

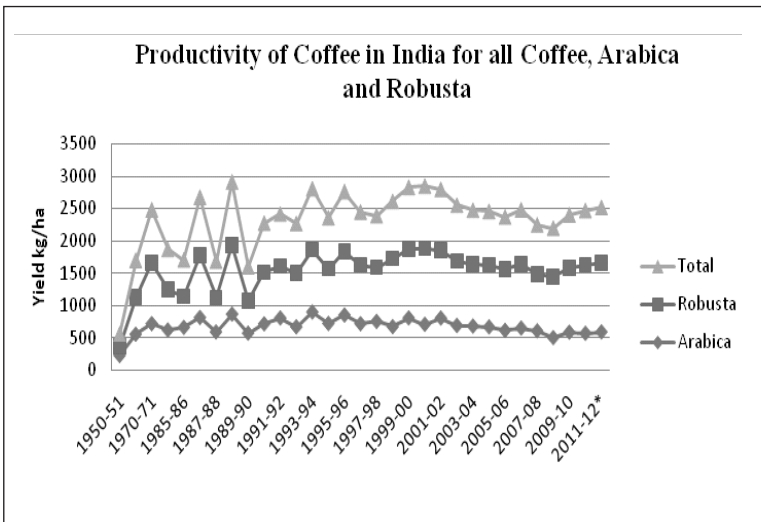
## **6. Risks facing the Small Coffee Growers in Kodagu: Field Observations and Analysis**

Coffee growers, especially the small and marginal ones are prone to different types of risks. One could broadly classify the risks into price risk arising due to liberalisation in the agriculture sector, increased integration with global market and uncertain changes in the trade policies; yield risk due to vagaries in climatic conditions and uncertainties in the input market, especially that of labour, fertiliser and irrigation; marketing risks, given the nature of vertical integration in the coffee industry and lack of bargaining at the producers level; and other risks the problems associated with land tenure and government policies like taxation.

Trends in the production and yield of coffee in India shows that there is a clear stagnation in the productivity of coffee, especially with the case of Arabica variety ( Figure 3 and Table 1). There is a shift in the

productivity of Robusta, since the liberalisation in mid 1990s. This shift in the yield induced by rising prices due to liberalisation in coffee marketing and external factors like frost in Brazil leading to tight in world coffee supply. Though the data used in Figure 3 pertain to all India level, the scenario should be reflective in the case of Kodagu district too, since the district contributes to around 37% of coffee cultivation in India.

**Fig 3: Coffee Productivity in India, (for all Coffee, Arabica and Robusta Varieties)**



Source: Coffee Board of India: Market Intelligence and Statistical Unit, Coffee Board of India, November 2012.

There is a huge variation in the yield experienced for coffee in different regions of Kodagu district. Output is threatened very often by irregular monsoon, attack of diseases, invasion of forest animals or lack of proper care and attention to the plants. Different regions experience



**Table 1: Productivity of Coffee in Kodagu District (kg/ha) with All India Average**

Year	2010-11			2011-12		
	Arabica	Robusta	Total	Arabica	Robusta	Total
Area (in ha)	28053	76727	104780	28303	75277	103580
Production (in Mt)	22025	102075	124100	21800	93225	115025
Productivity (kg/ha)	785	1330	1184	770	1238	1110
All India Average of Productivity (kg/ha)	575	1056	838	597	1069	852

*Source:* Coffee Board of India: Market Intelligence and Statistical Unit, Coffee Board, November 2012.

different kinds of problems pertaining to production of coffee and other crops grown in the region. South and north zones are more productive.<sup>1</sup> If, in the Virajpet region the yield of coffee goes up to 2500 kgs per acre, it is only 1000-1500 kgs per acre on an average in the north and central region (Coffee Board of India, 2012). This difference in yield is attributed largely to the topographical conditions including soil and the rainfall situation. Virajpet gets rains up to 70-80 inches which is seen ideal for coffee cultivation. Monsoon rains are heavy in the central Coorg region. In Madikeri, it is 120 to 140 inches which usually affects coffee plants due to rain related diseases. Observation from the field shows that Stem Borer, Berri Borer, White Borer, and Rot diseases are the most often heard diseases attacking coffee plants. Leaf rust disease has also been experienced during 1998 to 2000.

From the focus group discussions conducted in Mattikere and Gaalibeedu villages it is understood that the Coffee Board's intervention

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1. Coffee growing region of Kodagu is classified into- south zone comprising of Virajpet region, central region comprising largely of Madikeri and the north comprising that of Somwarpet region.

does not come immediately during the crisis; farmers say that it takes time for the remedial measures to reach them. In many a situations the remedial measure suggested by the Board is usually to uproot the plants. The farmers are advised to replant after a gap of three years. The small farmers say that such remedial measures are not affordable to follow as it would lead to huge income loss to leave their land idle. As most of these diseases are contagious in nature spreading to neighbouring farms, the inability of extension services to reach these farms has negative externalities.

Arabica variety of coffee needs more care and attention and is more prone to diseases like stem borer which is quite grave in nature. This is another reason why farmers in the process of replanting have moved towards robusta cultivation losing the premium value for their produce. Yet another reason what the farmers have cited as the reason for the shift to arabica cultivation is the unpredictability of blossom showers. At least, one inch rain in February-March (called the blossom shower) plays an important role in flowering and productive yield of coffee. The alternative when the rains fail would be to irrigate the crops through sprinkler irrigation. But as seen in Kodagu district statistics only 2.28 percent of net sown area is under irrigation. Small farmers showed their inability to equip themselves with such facilities given the income constraint. Also the life of arabica plant is shorter compared to that of robusta which is more resilient to bad monsoon, diseases and pests.

Age of the plant in some farms was seen as a constraint to yield of coffee, especially in the Madikeri region. Farmers interviewed said many small growers in this region were earlier cardamom producing farmers (for example Gaalibeedu and Katekeri villages in Mercara Taluka were known to be cardamom villages) and coffee was cultivated in small proportions. But after the outbreak of mosaic disease on cardamom plants which was extremely severe and no solution in sight for many

years, huge percentage of land was converted to coffee. The region which is less suitable for coffee has been forced to coffee cultivation. In addition, the coffee plants which were replanted due to other diseases are still young plants yet to reap their full potential.<sup>2</sup>

Attack of forest animals is another menace to coffee growers in the region. The district covering a large stretch of forest area is home to many wild animals. There are many instances of attack by wild elephants and monkeys who destroy a large stretch of crops reducing the yield of coffee. Since elephants are wild in nature, resisting the attack is hazardous for the farmers who have expressed their helplessness over the situation. So is the case of monkeys who come in large groups. Farmers feel that the yield loss due to such problems in the last year could be up to 30 per cent of the potential yield.<sup>3</sup> There has been no instance or effort by forest officials even to address this problem. As expressed by the farmers, during the crisis years there was no specific support of any kind extended either by the Coffee Board or Spices Board. Coffee yield experiences a typical cycle. December rain is seen as bad for coffee plants. This rain could lead to unseasonal flowering leading to high chances of flower dropping. Unseasonal rain since the last few years (which is the fallout of climate change and global warming) is often witnessed. Control of rot disease is seen possible by pruning of shade trees and controlling the shade which is seen crucial. Coffee Board officials who were interviewed in Madikeri office said that the poor yield of coffee in this region is largely due to the negligence of the farmers. They say growers do not adopt the right methods of cultivation including that of not pruning of the shade trees at the time required.

Rising labour problem, sharp increase in the cost of production over the last few years, inadequate irrigation facilities, lack of extension

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2. Coffee plants yield the best when they are 15-20 years of age.
  3. As understood from the focus group conducted at Katekeri village in Kodagu district.

services or reach of extension to farmers at the right time are often cited as major input related risks.

Shortage of labour and the problems associated with them is the most crucial of the input problem faced by the farmers in Kodagu district. Plantation sector, especially coffee and tea in India has been functioning through the permanent labour system where plantations with more than 10 ha of land are permanently associated with labourers living in the owner's estates. Since plantations, enjoy the status of the industry, plantation labour was protected through the Plantation Labour Act. With the demographic shift in the labour employed in the region, like the migration of the younger generation to cities and the advancement of education among the labour population, a severe shortage of labour is experienced in the region. According to the figures quoted by the Secretary of Coorg Planters' Association (CPA), Mr. K C Sudarshan, nearly 70% of the labour employed in the region is casual. Total number of permanent labourers in the district stands at only 11, 479. (Kodagu District Statistics, 2012) The ratio of workers to the net sown area (per ha) stands to .06: 1 One worker is available to 15.5 ha seen in terms of agriculture as a whole. However, if one adds the number of casual workers to this, the ratio would improve to .21:1. A crude estimate cited by Coorg Planters Association says that there is a shortage of 80% of labour in the region<sup>4</sup>.

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4. Information obtained through interviews conducted with the Secretary of Coorg Planters' Association, Mr. K.C. Sudharshan during October 2012 and January 2013.

**Table 2: Number of cultivators and Labourers in Kodagu District**

Number of cultivators and Labourers in Kodagu District					
Taluka	Net sown area in ha	Total Cultivators in nos	Total labourers in nos	Labour per hectare	Hectare per labour
Madikeri	52513	5006	2418	0.046046	21.71754
Somwarpet	48605	11470	5365	0.11038	9.059646
Virajpet	77361	4570	3699	0.047815	20.91403
Total	178479	21046	11479	0.064316	15.54831

Source: Kodagu District Statistics at a Glance, 2009-10, Government of Karnataka.

Currently the wage rate in Karnataka under the Plantation Labour Act (which varies from state to state) stands at Rs. 145 per day. Rs 84 is the basic pay and a DA of 72% of the basic pay adds up to Rs. 144.48 per day. The Karnataka government has pitched for hiking it to be Rs. 195 per day which is being contested by all planters associations including CPA. In addition, the permanent labourers are entitled to PF. Gratuity<sup>5</sup> is provided if the labour works for more than 5 years. In addition to that, the permanent labour gets yearly bonus and medical facility for the family in addition to educational facilities, housing, free water, free fuel and maternity benefits.<sup>6</sup> This together with bonus and other perks may sum up to a maximum of Rs. 240.

Provision of PF is applicable even for casual labourers if the number of labourers in the estate is more than 20. Casual labourers do not want PF to be deducted from their wages. They also do not want to

5. Gratuity is equal to 15 days of salary for every year of service according to the last drawn salary. Gratuity is given only when they have served 5 years in the particular service of plantation.

6. In Tata Coffee additionally they provide subsidised gas connection.

bond themselves to a particular owner. The earlier generation of permanent labour has aged and the next generation is reluctant to stick to plantations as workers. As told by Mr. K C Sudarshan, many workers today are literate and some educated so they prefer to migrate to urban areas looking for better jobs. The growth of tourism industry in the region has also attracted labour to the sector with better wages. MGNREGA programme has created 16.55 lakh man days of employment in 2010-11 (Kodagu District Statistics). The provision of housing facility through government schemes has been another attraction for the labour to move out of estates and liberate them from bondages. During 2010-11 alone 2,381 houses have been constructed under different schemes like Ashraya Scheme, Ashraya Yojana, Ambedkar scheme and Indira Aawaaz Yojana. So the bondage of workers sticking to the estates through supervision and control of the owners is reduced.

Also as casual labourers, the labourers can better negotiate their wages which is around Rs. 300-350 a day. It is an interesting observation from the field that the casual labourers earn more than the permanent labourers and sometimes even provide credit to these permanent labourers/ supervisors. This leads to peculiar linkage of credit market that in turn effects appropriate monitoring by the supervisors on minimum hours of work. The intervention and spread of SHGs, though not in a large way in Kodagu district, seems to have contributed especially the women labour away from agriculture. About 970 SHGs are functional during 2009-10 with 15,674 memberships of women in those organisations (Kodagu District Statistics, 2010-11).

Even with permanent labourers, not every estate follows the PLA regulations. According to Coorg Planter's Association Secretary Mr. K C Sudharshan, close to 60 % planters follow PLA. Many farmers say that labourers are not too keen on PLA wages since many farmers offer better pay than the PLA requirements.<sup>7</sup> This, in a way, is seen advantageous to

7. Based on interviews conducted with large farmers, Mr Vijayendra and Mr Rohit in Gargandur village in Somwarpet Taluka.

estate owners since they are free from providing many benefits. Many farmers reported that they had a few permanent labourers till a few years back but now they are totally reliant on casual labour. The problems associated with these casual labourers other than the higher wage factor are many. The distance of stay from estates has led to the problem of mobility from their houses to the work places. As told by Mr Prakash, a farmer from Katekeri Village has to gather workers during the harvest season and he has to arrange for their transportation with a pick and drop facility during the harvest season. He says they do not work for more than six hours a day. A good percentage of labour is migrants who have moved from West Bengal, Odisha, Andhra Pradesh, Tamil Nadu and Kerala. Some of the labourers lack refined skills in either plucking or pruning of the plants. Since the plucking season is also very close to flowering time for next crop, an unskilled job may lead to loss of yield for the coming harvest. Mr Vijayendra, a farmer in Somwarpet region mentions that the skills he had inherited from his father in plucking and pruning, to labourers with enormous training. He says such interest and attention now seem to be lacking among the small and large farmers of the region. Pruning of shade trees is yet another skilled task where the farmers are dependent on the casual labour. This task being very risky is a higher paying job. The wages for pruning of shade trees ranges anywhere between Rs. 400 to Rs 500 per day and those labourers are less in number. This has caused a disincentive in pruning the trees at the right time after monsoon. Thick shades caused by heavy rains could also be inviting wide variety of diseases to the coffee plants.

The nature of labour among the tiny farmers is different from the small and large cultivators. The tiny farmers many a times rely on community labour. In addition to depending on casual labour during the harvest season, the family labour works in each other's farm. Plucking from one acre of land with average yield would take 20 to 25 man days. This, in fact, is a good arrangement, but it is practiced only with the lowest economic strata of the population. Such system is very often not

seen among many small growers too who are well to do with other sources of income and may not prefer to work in their own farms. Stealing of coffee seeds by labour is seen as another problem in the post liberalisation period. Earlier licensing under TP3<sup>8</sup> was required to sell coffee while Coffee Board was the only buyer. But today anybody can sell in the open market in any quantity. So watching and monitoring the labour is another difficult task before the cultivators.

Shift in the demographic characteristics of the labour may be good for the workers. Scarcity of labour caused by flight of workers to better professions involving skills would lead to higher wages in the agriculture sector. This would help in attaining a new level of equilibrium in the labour market. Importance to schooling, education and health would lead to better standards of living. But some farmers are of the view that the higher disposable income in the hands of the labourers is often spent for debauchery. A social transformation of this community, is therefore, deemed imperative.

The cost of fertiliser, diesel and machinery have gone up considerably over the years. Fertiliser prices have almost doubled in the last five years. This is in addition to wages which is seeing a non-linear growth. The equipment needed for mechanisation in spite of 50% subsidy, is not affordable for small and marginal farmers. The increased cost of production in addition to shrinking profit margins without a corresponding increase in the farm gate price, might also lead to losing competitiveness in the international market. The emergence of Vietnam as a major producer and competitor and the revival of Brazil from distress have led to more competition for Indian Coffee. This means that Indian coffee growers need to be more efficient producers and explore ways of product diversification along with horizontal and vertical integration.

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8. This system of licensing existed when Coffee Board had the monopoly to buy coffee from the farmers before liberalisation in the nineties.

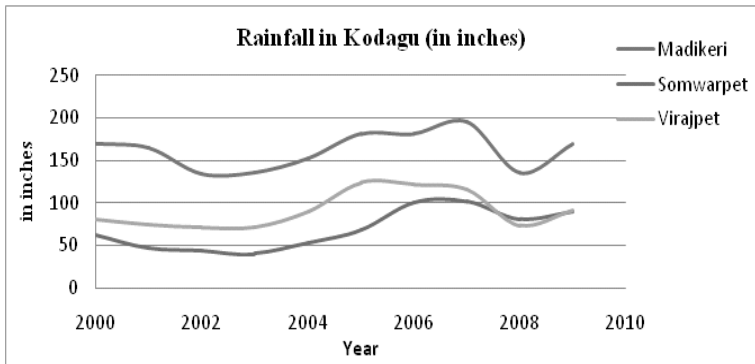


Kodagu which is the place of origin for major rivers like Cauvery, ironically denies enough water to the cultivators in many parts of the district. Lack of irrigation especially when monsoon fails has resulted in the low yield of coffee in the district. Table 3 shows that only 2.28% of the net sown area in Kodagu district is irrigated. The variation in monsoon rains in the district is very pronounced (See Figure 4). Madikeri, which is the central region, gets the highest rainfall which very often ends in affecting coffee plants. Somwarpet region which gets the lowest of rainfall stands to be a little more irrigated but more than 90% of the cultivation in this region depends on monsoon showers. Blossom showers of at least one inch of rain in February to March are crucial for good yields during the years. But when it fails, irrigation works as a good alternative. Of the farmers who were interviewed some of them said they cannot afford this though subsidies are provided by the Coffee Board, Spices Board and by government. The region being hilly in landscape, electricity is also a major problem. Power outages are longer when electricity is badly needed by farmers to irrigate the land before the arrival of monsoon.

**Table 3: Net Irrigated area in Kodagu District**

Net irrigated area in Hectares in Coorg district and % of net sown area 2009-10			
Region	Area under Irrigation (in ha)	Net sown area in (ha)	% of net sown area
Madikeri	113	52513	0.215185
Somwarpet	3631	48605	7.470425
Virajpet	335	77361	0.433035
Total	4079	178479	2.285423

Source: Kodagu District Statistics at a Glance, 2009-10.

**Fig 4: Trend in Rainfall in Kodagu District (in inches)**

Source: Kodagu District Statistics at a Glance: 2009-10.

Whatever be the R&D efforts carried out by Coffee Board and Spices Board, the reach of such inventions through extension services to the farmers is found to be limited. From the focus group discussions it is observed that the tiny and many small farmers are even ignorant of the facilities and incentives provided by Coffee Board and Spices Board. While interviewing the officials of the Coffee Board in Madikeri office, the officials said that advice is provided when people come to them. Creation of awareness is very important in such situation where the farmers would not take a pro-active role due to their ignorance. A large farmer, Mr Vijayendra from Somwarpet region said that lots of extension services are available on the Coffee Board website and they are very useful means of information. However, no specific efforts are made by the Board to disseminate such information among farmers. Even a few large farmers are of the opinion that machines used for pruning, plucking and weed cutting are not too suitable for the terrain and the health of the plants. Next year's crop is affected badly if harvested by machines<sup>9</sup>. The secretary of Coffee Board recently said that government was

9. Based on the interview with Mr Rohit who owns more than 25 hectares of land in Somwarpet region.

considering a proposal to form a separate scheme for transfer of technology and capacity building to strengthen the R&D findings to the field. The coffee Board has also pitched for more incentives and financial support in the 12<sup>th</sup> Plan period (2012-17) to help the industry enhance shipments of value added products. (Deccan Herald, January 28, 2013).

Government policies and regulations affect the cost of cultivation, prices and farm practices of coffee. There are many policies and regulations that affect the coffee growers. These policy and regulatory hurdles include, but are not limited to, labour and wages, land, environmental and pollution related concerns, tax and subsidy related issues. Based on the discussion with Mr. K C Sudharshan, Secretary, Coorg Planters' Association (CPA), some of these policy and regulations were identified.

Karnataka state government is now contemplating to increase the current minimum wages from Rs. 145 per day to Rs. 195 per day. CPA has been contesting this hike in wages that may have a cascading effect on current wage structure leading to further increase in the cost of cultivation. The Central government had mooted the idea of bringing in land ceiling in plantation sector. CPA has contested the idea of bringing out land ceiling and has given petition against this.

Another major regulation affecting the coffee plantation is the State Pollution Control Board, Act 2008. Pollution control department says that the pulping activity in coffee (the process to remove the pulp to get the coffee beans) generates effluents and the pulp and pulped water cannot be put into the water stream or ground water. The planters, therefore, have to maintain a lagoon of polyethylene sheet to contain the water and let to evaporation. A planter with more than 35 acres needs to have three such lagoons, whereas a small and tiny planter has to maintain one lagoon of specified size. However, natural evaporation of water is difficult in the absence of proper sunlight. Creating such lagoon

with specified quality of polythene cost a planter about Rs 3.5 lakh. This adds to the cost of cultivation especially for planters involved in pulping activity. CPA has submitted a memorandum to environment ministry seeking the repeal of the Act.

Gadgil Committee Report on ecosystem vulnerability of Western Ghats suggests that coffee is a monoculture. This report, if accepted in totality, entails declaring all areas under coffee as monocrop and the forest area within the plantation or surrounding the plantation would be declared as buffer zone which may restrict and curtail the access of planters to forest resources. Planters' dependency on firewood from the neighbouring forest is very high.

Central Income Tax Act Section 7(B) attracts tax on 60 per cent income if curing of coffee is part of the estate activities. Therefore, most planters including the corporate planters have outsourced the curing activity or made curing as a separate entity to avoid this tax. This has created a separate entity of curers who now play a critical role in price determination of coffee. Similarly, the export subsidy for coffee is passed on to the planters. Any change in this subsidy would also affect the farm-gate price of coffee.

A coffee planter faces several uncertainties relating to production, input, price volatility or exchange rate volatility. If policies are not clear and uniform, this would add more uncertainty to the planters. In this context, minimum wages and State Pollution Control Board policies are state specific that may make the planters of the state less competitive as compared to other states.

### **Marketing Risk**

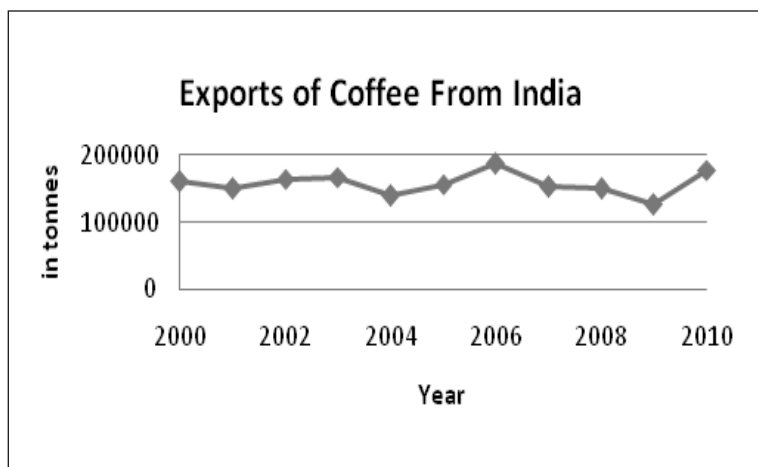
External threat with rise in competition from other players, volatile prices in a liberalised atmosphere, a buyer driven-roaster-controlled supply chain, asymmetry in information between the sellers

and buyers, concentration of buyers, failure of co-operatives on marketing of products, and quality concerns with coffee produced by small growers are the major problems leading to risks in marketing of coffee in India.

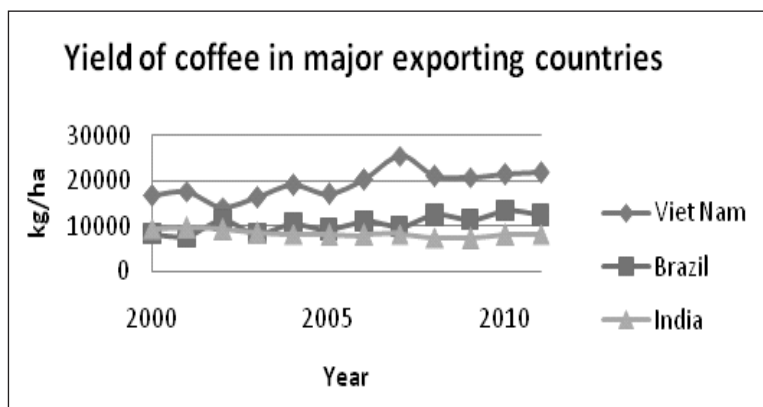
### Risks from External Factors

India is the 7<sup>th</sup> largest coffee producer in the world with 3,02,000 tonnes of output in 2011 (FAO). Brazil, Vietnam, Indonesia, Columbia, Ethiopia, and Peru are some of the major coffee producing countries. India is ranked only 13<sup>th</sup> among the major exporters of coffee in the world. Brazil, Columbia and Vietnam are consistently the top coffee exporters. Exports of coffee from India have been highly fluctuating. Italy, Russian Federation, Germany, Belgium, Spain, Finland and Greece are some of the top destinations for Coffee Exports from India. The USA, Jordhan, Slovenia, Malaysia, Spain and Turkey are gaining prominence among the export markets. (www.fao.org).

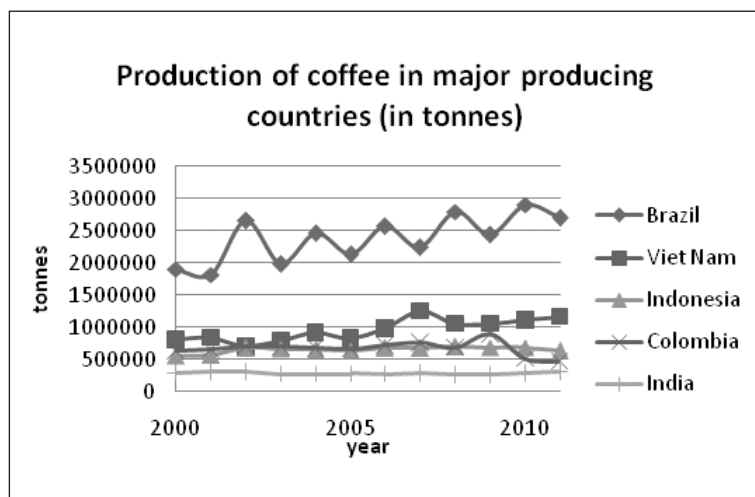
**Fig 5: Exports of Coffee from India (in Mt)**



Source: Compiled from Coffee Board of India Statistics, 2009-10.

**Fig 6: Yield of Coffee in Major Exporting Countries**

Source: Compiled from [www.fao.org/statistics](http://www.fao.org/statistics).

**Fig 7: Production of Coffee in Major Producing Countries**

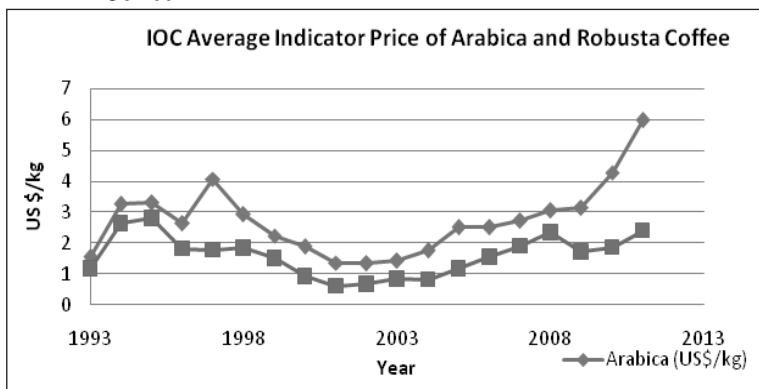
Source: Compiled from [www.fao.org/statistics](http://www.fao.org/statistics).

There has been a downward trend in exports from India in early 2000 to mid-2005 with recovery in 2006 followed by a decline. India's share in the world exports of coffee has slightly increased to 5% from 4% during the last decade. Domestic consumption of coffee now stands at 1,15,000 tonnes which has steadily increased since the last decade. But this increase in the consumption of coffee has not translated to higher prices for farmers. This calls for probing the nature of supply chain of coffee marketing in India.

### Volatility of Price

Unlike in the past, when domestic markets were protected with government regulation through Commodity boards, the post liberalisation period since the mid-nineties volatility in coffee prices has increased.

**Fig 8: Trends in the International Prices of Arabica and Robusta Coffee**



Source: Coffee Board of India Statistics, 2012.

Though coffee's contribution to export earnings has reduced, it still remains a major source of livelihood for lakhs of people. Going by the price trends, coffee seems to have proved the theory that opening up

of economy would reduce the extent of commodity price instability wrong. Free trade economists who pose this argument believe that the removal of tariffs, quotas and other trade restrictions would reduce agricultural price instability.

**Table 4: Price Instability of Coffee in the Pre-reform and the post reform period**

Inter Year Price Instability for Coffee /Year	1980-2010	1980-1990	1991-2010	% change
Price instability using the nominal price	40.81	7.50	33.83	351.34
Price instability using the real price	40.12	8.19	30.03	266.55

*Note:* Instability measured using Cuddy and Valle index from the price data from various commodity Boards.

*Source:* Anoopkumar, 2012, Discussion Paper No. 13, NRPPD, CDS.

World demand and supply for coffee showed a scenario of over supply during the early 2000. This phase lasted for quite long. Whenever the price of green coffee goes up the production too increases in the next cycle bringing back the price to previous levels. (Almeida et al 2009). Short term volatility creates a confusing picture making it difficult for farmers to take any production decisions. 2000 to 2004 saw a rapid decline in coffee prices but from 2005 -2010 the prices recorded a steady growth. Controlling the price of coffee in India is not possible as the market prices of robusta and arabica are determined 'by the commodity exchanges in London and New York respectively.

In the pre reform period, the domestic price of coffee did not show any correlation with the domestic or global production. While price remained more or less stable, production has been fluctuating both at



the domestic and global level. With the liberalisation of commodity markets since 1991 domestic price of coffee has responded more to global production cycles and less to domestic production cycle (Anoopkumar, 2012). The inter year price instability, however, is common to many agricultural and plantation commodities thanks to seasonality. Coffee being an annual crop, the inter year cyclicity is seen to be quite high. Production peaks during the harvesting season of December to March. The price increases steadily in the off season months of September, October, November and May though with a few years of exception (Anoopkumar, 2012). This reflects that the futures trading or forward contracts have not made enough impact on the prices of coffee. It is a matter of serious concern that the average duration of the boom phase is lower than that of the slump phase (Figure 8). The amplitude of the cycle has widened for coffee which adds more to instability and adverse situation. Since coffee is a long duration crop which takes 4 to 5 years to harvest from planting the multi-year cyclical movements are shows that it takes a few years for production to adjust to the changed demand scenario.

It is therefore, well established that volatility in prices has increased in the post-liberalisation scenario. However, the farmers who were interviewed were of the opinion that though prices are not stable in the post-liberalisation period (and were more stable during Coffee Board's monopoly period) prices are much higher than what Coffee Board would have offered. The private traders and agents, immediately after liberalisation, offered the price at least 4 times higher than what Coffee Board paid farmers. One farmer cites the instance of 1975 when farmers were offered Rs 5/kg while the price in London was 52 cents /kg, thus denying the farmers the benefits of higher international prices. The Board however, would have sold coffee at higher prices, not transferring it to farmers, reflecting the amount of corruption in the system. Now at least, a few farmers are informed of international prices in London and New York through the internet and have some scope to bargain with the local agents.

## **Buyer Driven Supply Chain**

Since coffee is largely a globally traded commodity and predominantly large players are involved in trading, the supply chain of coffee is quite complex. The value chain of coffee is typically an example of a buyer driven chain, specifically controlled by large roasters (Ponte, 2001). This is so after the dismantling of quotas and International coffee agreement. Sellers are oligopolistic and buyers are oligopsonistic in nature. They hedge price fluctuations by trading in the futures markets (Almeida, et, al, 2009, Upendranadh and Subbaiah, 2012). After the liberalisation in coffee marketing which put an end to the monopoly of the Coffee Board, the roasters and exporters have gained tremendous control on the market. Earlier studies on coffee supply chain in India concluded that there is a lack of vertical integration between the producers and roasters/exporters (Venkatesh, 2011; Upendranadh and Subbaiah, 2012).

There are four major stakeholders from farmer to retailer in the coffee value chain. The farmers largely sell their produce to the local traders who act as agents to the curers, who in turn sell it to the roasters and, they in turn to the exporters or the retailers. At the farm gate, nearly 80% of the coffee is directly sold in the form of cherry to the agents. Moisture content and out turn are the two parameters that are considered by agents to determine the price at this stage. These agents act as intermediaries between the farmers and the curers. The curing agents are the most important players in the coffee supply chain. The curers have their own agency network, wherein there is an assured supply of coffee and a regular flow of information. The agents, therefore, work in favour of the curers and mainly supply coffee cherry on the agency network. The agents handle large volumes and have their own transportation and sometimes even storing facilities, thus collecting the produce directly from the farm gate. They also make payments to the farmers on the spot. The farmers are also bonded to those agents since they are a major source of financial support during the distress time. Information obtained

from the field from small farmers shows instances of farmers borrowing from the agents for less than a day, an amount of Rs 10,000 at an interest of Rs 100 which is not possible with any other source of finance.<sup>10</sup> This helps the agents to get an assured supply of raw materials and a sense of security for the farmers who see the agents as their well-wishers.

Coffee cherries may be processed either by hulling (opening of dry cherries to remove the outer skin) or by washing through parchment process. In case of washed coffee, wet coffee cherries are washed and opened and then dried under the sun or through machines. Parchment and washed coffee is more valued as compared to that of hulled coffee. Washing and parchment, however, involves a processing cost which may not be viable if the production is in small scale. The curers of coffee are spread at the regional level, most of them in Kushalnagar region which is well connected with roads and infrastructure. All curers are controlled by the exporters (some curers are also exporters) who are disseminators of information. The curers who trade in large volumes and have good storage facilities have the flexibility to speculate. The largest margin of profits is reaped by the roasters, while it is sold as the speciality coffee in domestic and international markets. This, however, would involve huge selling and marketing costs.

### **Price Determination at Farm Gate Level**

With the integration of domestic market to international market the farm gate prices are trickled and prices transmit top down from the international markets to the farm gate. The prices of Robusta and Arabica coffee are dependent on London International Financial Futures and Options Exchange (LIFFE) and New York market respectively. The following flow charts provide the process of farm-gate price determination for both types of coffee.

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10. Based on interview with Mr. Kiran, a small farmer who also runs trekking/adventure club business from Katekeri village, Madikeri Taluka in Kodagu district.

**Table 5: Determination of Farm-gate price for Robusta and Arabica Coffee**

Price Chain	Factors determining prices at different level	Pricing of Robusta	Price of Arabica
<b>LIFFE/NYC Price</b>	<ul style="list-style-type: none"> <li>LIFFE/NYC Price is determined by the commodity trading in that market through international buying and selling</li> <li>USD 300 is added to average out different grades and quality of coffee for Arabica varieties.</li> </ul>	1934\$ at LIFFE per Metric ton. Add \$300 to average out the quality, which is \$2234	£150.6c at NYC. 150.6X22.0462= 3320 \$. (No additional grading average out price in Arabica)
<b>Exchange Rate</b>	<ul style="list-style-type: none"> <li>Exchange rate is determined through the exchange rate market which is dependent on varieties of factors</li> </ul>	1\$= Rs 54.76 Robusta per metric ton 2234 X 54.76= Rs 122333.84. Per kg price is Rs. 122.33	1\$= Rs 54.76 Arabica per metric ton 3320X54.76= Rs 181803. Per kg price is Rs 182
<b>Export Subsidy</b>	<ul style="list-style-type: none"> <li>Government of India currently provides 5.5 percent of export subsidy on Coffee export</li> </ul>	122.33 + 5.5% of 122.33 = Rs 129.06	No export subsidy

cont'd

Price Chain	Factors determining prices at different level	Pricing of Robusta	Price of Arabica
	<ul style="list-style-type: none"> <li>This subsidy amount is added to the above arrived price. In other words, the export subsidy is passed on to the producers.</li> <li>Rs 4.5 per kilogram of Coffee is subtracted from the above arrive price towards the expense relating to handling charges and other transaction costs.</li> </ul>	129.06-4.5= Rs 124.56	182-9= Rs 173 per kg (9 rupees as handling charge and no separate charge for the agent)
<b>Handling/ Transaction Costs</b>			
<b>Farm-gate Price</b>	<ul style="list-style-type: none"> <li>The price arrived at from the following iteration determines the farm-gate price. Agents keep a margin of Rs 4 per kilogram of coffee.</li> <li>In crux, the variability in coffee prices is dependent on 3 factors namely, the price at LIFFE, exchange rate and government policy towards export subsidy</li> </ul>	124.56-4= Rs 120.56 per kg or farm-gate price for 50 kg bag equivalent to 26 kg beans is 120.56X26= Rs 3134 per bag of 50 kg	Rs 173 per kg is the farm-gate price. Farm-gate price for 50kg bag equivalent to 41 kg of beans is 173X41 = Rs 7093 per bag of 50 kg

Source: Compiled by authors based on the interview conducted with curer and exporter, C P Exports at Kushalnagar in January 2013.

Table 5 provides the details of the price chain and price determination at farm-gate for Robusta and Arabica varieties of coffee. These prices at farm-gate are influenced by the LIFFE and NYC commodity exchange market price. The commodity market price is essentially influenced by speculation relating to supply situation in major producing countries and demand situation in global market. Besides, international commodity exchanges, two other factors that influence the farm-gate price are exchange rate and government policy on export (eg. export subsidy).

In domestic market the price is determined by adding up handling charges and export subsidy based on the price at the curing level. For example, if PB variety of Robusta coffee is Rs 126 at curing level, the selling price to roasters would be 126 plus 10% of 126 ie. Rs 127.26. The 10% additional price includes the export subsidy of 5.5%. The roaster on an average gets 80% out turn (OT). Therefore, per kg of roasted coffee would be  $\text{Rs } 127.26 \times (100/80) = \text{Rs } 159$ . Considering other costs of roasting and profit margin, the consumer buys PB variety of coffee at Rs 240. This price again changes based on proportion of chicory mix. Chicory price is around Rs 30 per kg. What is important here is that any export subsidy/tax on coffee affects the domestic consumption price. In other words, domestic consumer subsidises the export price and hence export subsidy policy has a direct impact on the macroeconomic fundamentals of the domestic economy on the one hand and works as a support at farm-gate level on the other.

Instant coffee which has the highest price in consumer market is often made from inferior grades of coffee. 3kg of coffee beans makes 1 kg of instant coffee powder. Therefore,  $120 \times 3 = \text{Rs } 360$  would be the cost of per kg instant coffee at curer price level. A final consumer buys this coffee almost at Rs 900. A large part of this margin, apart from profit, goes into marketing and advertising cost that established companies spend.<sup>11</sup>

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11. Based on the interview conducted with curer and exporter, C P Exports at Kushalnagar in January 2013.

## **Barrier to Entry and Concentration of Markets**

Almost 70% of the coffee produced in India is marketed for exports (FAO, 2012). Of the 75 coffee exporters who form the top end of the value chain of coffee, the top 10 contribute to 75% of the total exports in quantity (Coffee Board, 2011, cited in Venkatesh, 2011). This speaks of the market concentration and oligopolistic nature of the coffee market. The curers or exporters also need to grade their products if they need to cater to the international market. Large storage of good conditions, grading facilities which require technology and investment and the already established scale of operation and networking with international market have acted as barriers for entry to the small growers. A large volume of coffee traded in international market is a blend of various coffee beans from different origins. The sources of origin and the formula of blending are therefore established among the exporters. The roasters in importing countries have a path dependency of relying on a small number of suppliers who assure them the supply required for the blending formula. This is another major constraint for small players to enter the export segment.

The other channel where coffee is sold is through ICTA auction and selling to domestic roasters. The volume of transactions in ICTA auctions has been steadily declining due to constrains in transportation, the tax imposed on volume of transactions and delay in payment settlements<sup>12</sup>. The large domestic roasters are also few in numbers selling speciality coffee in the domestic segment based on their brand names. The domestic consumption of coffee is therefore largely brand driven preventing small players from entering the domestic segment.

## **Information Asymmetry and Interlocked Markets**

The value chain analysis on coffee shows a price spread of 42% from the producer to the roaster (Venkatesh, 2011). The information

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12. Based on interview with coffee Board officials in Madikeri.

obtained from the curers in Kushalnagar shows that the price spread currently goes to 50% between the farmer and the end retailer (see Table 5 above). Such a spread is unlikely in many agricultural commodities. This situation has been attributed not just to the asymmetry of information between the buyers and sellers but also the interlocking of markets created with agents and farmers due to various reasons. While agents provide direct information on the production at the farm level to the curers and the exporters, the farmers lack knowledge on activities of the supply chain and are helpless about the profits reaped by the roasters and retailers. Asymmetry of information lies not just with the information on prices (which has narrowed due to spread of internet and market information) but largely on information pertaining to the complexities in the supply chain. Though the penetration of internet has led to good spread of information on coffee prices, only a few farmers who are educated and informed update this information. The small farmers lack bargaining power and are not vertically integrated with the top end players of the supply chain. A large section of small farmers are interlocked with agents under different situations and, therefore, do not dare to bargain for higher prices even if they are well informed about prices. The poor storage capacity with the small farmers is also another factor leading to hasty selling. The level of concentration of markets on the global scenario facilitates a small number of multinational traders and roasters to dominate the supply chain and set requirements for other actors in the chain. These governance structures are often challenging for those who lack resources or skills to obtain and sustain the necessary certification, quality standards and skills to undertake processing to increase their bargaining power (Venkatesh, 2011).

### **The Failure of Co-operatives**

It is a known fact that a co-operative system has acted in favour of farmers in the case of many agricultural commodities and a solution to the anticompetitive practices of the traders can largely lie with the formation of co-operatives. Unfortunately, the co-operative movement



of coffee growers in India was short-lived and unsuccessful. A national level co-operative by coffee growers in the name of COMARK was set up in 1992 immediately after liberalisation in coffee marketing. The organisation had a membership of nearly 5500 coffee growers and its equity was held by the members, government and National Co-operative Development Corporation. However, this co-operative had a very short life due to poor management and loss of confidence of farmers during low international prices. The other reasons that one can cite for the failure of this body is the fact that it had limited role to play in price control due to the small share of India in international coffee market. So, when the prices are good, members are happy, when the prices crash, they fail to understand the international price movements and its impact on co-operative's performance. In such a situation, the role of co-operative is much more than selling of the produce as per international prices. There were no efforts made by the co-operative to touch the domestic segment and compete with the private players.

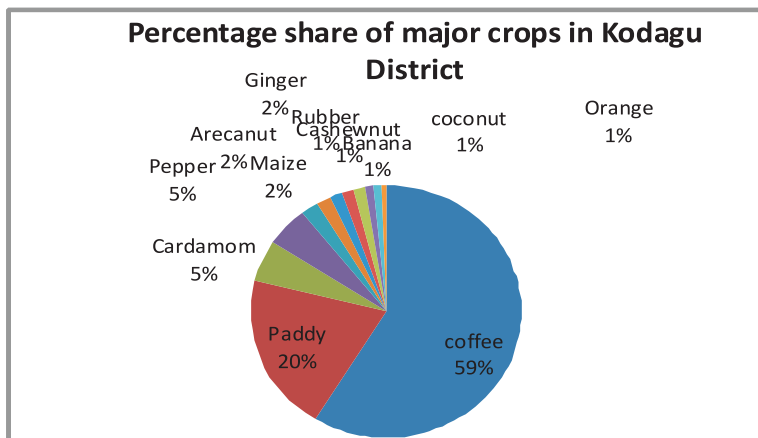
The system was also blamed for a high level of corruption and lack of modern marketing mechanisms. There were other small co-operatives who were selling coffee in the ICTA auction but with the decline in the volume of trading through this channel members moved out of such co-operatives rendering them inactive. According to David and Clementine (2008) the success of co-operatives in the Indian context would depend on four major factors; building confidence among members, being transparent in functioning, implementing fluidity in payment, and in reaching new markets. A few large farmers while being interviewed in the field were of the opinion that the co-operatives so formed were corrupt and people lost confidence in its functioning. Also, there is no unity among the members in the community while people are self-centric which led to the growth of agency network in coffee marketing. There is a lack of leadership from even large farmers, which is crucial especially in the nascent stage of functioning of such co-operatives.

## 7: Diversification in Coffee Cultivation: Is it a Feasible Solution to Mitigate Risk? :

### Extent of Diversification

Kodagu is known for its rich bio-diversity and agro-climatic conditions. A favourable climatic condition with thick forest coverage is found suitable for cultivation of varieties of crops in the region. Though the region is known for the cultivation of coffee, the district has been known for spices like cardamom, pepper, ginger, honey, forest products like cinnamon, cash crops like arecanut and horticulture products like orange, chikku and banana as well as paddy. The Kodagu District Statistics of 2009-10 shows almost 35 crops being cultivated in 1,79,001 ha of net sown area. The figure below shows the percentage share of the major crops grown in the region.

**Fig 11: Percentage Share of Major Crops in Kodagu District**



Source: Kodagu District Statistics at a Glance: 2009-10.

The Herfindhal's index (sum of squares of the percentage share of each crop in the gross cropped area)<sup>13</sup> shows 0.37 which represents a

13. If the index is close to zero it indicates diversity and index close to 1 indicates concentration.

good amount of diversity at a macro level. Along with coffee, paddy is grown as a staple crop but is carried out largely by small farmers under rain fed conditions. Pepper, cardamom, horticulture products like oranges and ginger is intercropped with coffee, coconut and arecanut are other crops grown in some parts of the region. Honey produced in the region has a different flavour which is obtained from both forest sources and bee culturing.

### **Problems Towards Diversification**

Having seen the amount of diversification of the crops grown, we try to address the question whether diversification of crops has helped in hedging price and income risks of small farmers in the region. The observations from the field showed that at the farm level, amount of diversification has reduced though the number of crops grown in the region (in Kodagu district as a whole) crosses the 35 mark.<sup>14</sup>

Cardamom which was largely grown in Madikeri, the central region of Kodagu has almost perished due to the mosaic or marble disease outbreak more than a decade back. As discussed in the earlier sections, Gaalibeedu and Katekeri villages in Madikeri Taluka were earlier totally cardamom villages. The disease attack being so severe, the remedy was to uproot the plants and leave the land idle for 3 years before planting the next crop. The farmers, who were not able to afford the solution, had converted a vast stretch of land into coffee cultivation. Spices Board or the government was not quick enough in finding a solution to the problem. Some farmers said they went in for the cultivation of silk which had good market in the neighbouring towns. But that was not sustainable. The cultivation of cardamom now stands at only 5% of the total cultivated area in the district (Kodagu district Statistics, 2009-10). The variety of cardamom grown in the region has a special flavour and

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14. Opinions formed through focus group discussions conducted in Katekeri and Gaalibeedu villages and personal interviews held with large and small farmers at Madikeri and Somwarpet Talukas.

has good demand in domestic and international markets. But even after the recovery from this disease the growers had not gained confidence to go in for cultivating this crop since they found it to be highly risky. The extent of diversification within coffee variety has also reduced as per the information obtained from farmers. Arabica variety of coffee is replaced with Robusta in every replanting since there are higher costs and risks involved in managing the Arabica plants which are more prone to diseases like that of stem borer and leaf rust.

Pepper is grown as an intercrop with coffee and its share stands at around 5% of the crops cultivated (Kodagu district statistics, 2009-10). Since the shade trees act as a base for the spread of pepper vine, majority of the farmers go in for the cultivation of pepper in the region. The cultivation of pepper is more found in Somwarpet and Virajpet talukas due to ideal monsoon in the region. The central region of Madikeri usually faces heavy rainfall damaging pepper vines and aiding the outbreak of fungal diseases. The farmers in Katekeri region complained of total crop loss during last year due to excess rains and the foggy weather. Quick wilt, slow wilt, leaf and spike rot are some of the major diseases which have attacked pepper cultivation in the region.

Similarly, the share of orange, another major crop cultivated in the region, has been reduced to just 1% (Kodagu district statistics, 2009-10). The spread of fruit rot disease in the region has made the farmers to discontinue replanting this crop. The orange from Kodagu is known for its high citrus quality, has good domestic market and also fetched a good price. However, farmers from Somwarpet region were of the opinion that the suitability of the region for orange cultivation has reduced.

Ginger cultivation in the region has been on the rise. With environmental concern this is seen as a negative development. Ginger cultivation reduces the water table due to the heat generated and also a high amount of pesticides used for its cultivation. With the ban of ginger cultivation in Kerala a few years back, ginger merchants migrated to

Kodagu region and encouraged the cultivation of this crop. Attracted by good price, many farmers are now into the cultivation of ginger ignoring its long term side effects.

In addition to the yield and production related problems, there are a few other significant barriers in increasing the amount of diversification. The cultivation of cardamom and pepper are both labour intensive. Both these crops require one or other sets of skills. Plucking of cardamom is of an intrinsic nature and is quite labour intensive. The drying of cardamom requires the hot chamber facility which is not available with small farmers. The season of harvests for those crops being spread across the year, farmers have to be labour dependent throughout. With the casualisation of labour there is no availability of labour at the disposal like what it used to be under permanent estate labour scenario. On the other hand, if only coffee is grown the dependence of labour is only during plucking season from December to February and the labour is contracted for the period. In case of commodities like pepper and coconut there is shortage of labour with skills of climbing the tree. A farmer, Mr Ganesh who is cultivating pepper in Gargandur village in Somwarpet region said he has contracted the harvest of pepper to agents. These agents decide on the amount based on rough estimate of yield which very often is underestimated leading to loss to the farmers. Similarly, the time for spraying the pesticides and insecticides also varies based on the requirements of different crops. This task is again labour intensive. Vanilla was once tried by many farmers when the price was very attractive. But when the price showed a declining trend, farmers stopped cultivating. This also requires a very specific skill of pollinating in a particular season. Paddy cultivation among small farmers is totally monsoon dependent. Paddy, also being another labour intensive crop quite a few farmers said that they have stopped cultivating paddy. Some of the fields not suitable for converting to any other crop are left idle. A farmer in Katekeri village said that they used to cultivate paddy since generations through output sharing

agreement with permanent labourers (the labour cultivating paddy is entitled for half the crop harvested). But now with complete dependence on casual labour, paddy cultivation is no more viable. They being old and their children having migrated to cities for jobs, managing multiple crops is not feasible for them.

Yet another disincentive towards diversification of crops is from that of policies. The subsidy or support given by the Coffee Board and Spices Board lack co-ordination across departments. Many subsidies are entitled on an acreage basis and once the farmer gets the subsidy from Coffee Board he is not entitled for certain supports from Spices Board. This makes it easy for the regulatory authorities to administer the mechanism. However, this could also work as a disincentive towards growing of multiple crops.

Home stay business which is mushrooming in the estate homes of the farmers has diversified the farmers into off farm activities. Kodagu being a tourist destination and with the upcoming concept of ecotourism, farmers have tapped the potential seen in this sector. The business is highly remunerative, as home stays are priced competitively with that of hotels around the region. This has also shifted the managerial time and effort from agriculture to that of other businesses. Though this would act as an additional income for farmers in the short run, the long run sustainability of this business and its impact on ecosystem of the region needs to be analysed.

### **Diversification as a means to hedge Risk**

This section analyses the trends in the yields and prices of coffee and related crops and examine whether diversification of crops if properly encouraged through policy intervention would help in minimising the yield and price risks, the two major risks faced by the small farmers cultivating coffee.

**Table 6: Price Instability comparison of Coffee with two major intercropped commodities**

Commodity/Period	1980-2010	1980-1990	1991-2010	%change
Coffee	40.81	7.50	33.83	351.34
Cardamom	48.80	48.70	36.70	-24.64
Black Pepper	56.59	31.01	53.74	73.30

*Note:* Instability measured through Cuddy Valle Index with the data from Coffee Board and Spices Board of India.

*Source:* Anoopkumar, 2012, “Commodity Price Instability under Globalisation: A Study of India’s Plantation Crops” Discussion Paper No. 13, NRPPD, CDS Trivandrum.

Table 6 shows the increase in the instability in the coffee prices during the last decade, while the instability in the prices of cardamom is reduced. The instability of pepper prices, overall seen for the decade, has also increased. The instability in prices of cardamom having reduced in the post liberalisation period, the commodity which has a large potential to be intercropped with coffee, would act as a natural hedge to price instability. Table 6 gives the yearly trends in the prices and yield of coffee and other related commodities grown in the region.

The trend in the yield and prices of coffee and the related commodities, i.e., commodities intercropped or crops grown in the region is analysed in Tables 7 and 8 respectively. Comparison of trends in yields of coffee and related crops shows a good amount of dissimilarity in the yield cycles which would help in hedging the yield risk. Coffee experiences a short yield cycle of 1-2 years whereas cardamom has a long yield cycle of 5-6 years. While coffee has a falling yield trend during 2003-09, cardamom has an increasing trend since 1998. While pepper also has cycle of 5-6 years, the correlation in yield cycles of

**Table 7: Trend Analysis in Yields of Coffee and Related Commodities**

Commodity	Peaks	Dips	Upward Movement	Downward Movement	Nature of Cycle
Coffee	1989, 1994, 1996, 2001	1984, 1990, 1998, 2009	1998-01 2009-11	2002-09	Short cycles of 1-2 years upto 1997. From 1998, 5 year cycle observed. Falling trend from 2003-09 and a recovery from 2009-11.
Cardamom	2005, 1996	1988, 1998	1982-85 1988-97 1998-05	1986-88 1997-98 2005-08	5-6 years cycle. Increasing trend since 1998
Orange	1989, 1993	1988, 1992, 1995, 2003	1980-87 1995-97 1988-91	1993-95 1997-03	2-3 years short cycles. Steady fall since 1993
Pepper	1995, 2006	1985, 2002, 2009	1994-99 2002-06 2009-11	1980-85 1999-02	5-6 years cycle. Falling trend since early 1990s.
Rice	2011	2002	No cycle seen	- - -	Steady growth since 1980 with a short dip in 2002. No cyclical pattern observed.

*cont'd.....*



Commodity	Peaks	Dips	Upward Movement	Downward Movement	Nature of Cycle
Ginger	1992, 1996, 2011	1995	1980-92	1992-95	4-5 years cycle. Upward trend since 1980 with few dips.
Areca nut	1998, 2002	1984, 1999	1996-1998	1984-88 1981-91 1998-01	4-5 years cycle. Has been more or less stable since 1980s with a peak in 2002.
Banana	1988, 1999, 2008	1988	1988-99 2003-08 2004-11	1999-2003 1987-88	Upward trend from 1980/091 and a downward trend from 1999-03. No cycles seen.
Cocoa	Not seen	Not seen	2000-02	1994-2000 2002-11	Steady decline from 1994-2011 with a minor recovery in 2002.
Coconut	1994	1986, 2004	1986-1994 2004-2011	1994-2004	Long cycles of 7 years.
Natural Rubber	2006	Minor fall in 1993 and 2007	Since 1980	Not seen	Steady upward trend. No major dips in the yield.

Compiled from FAO database: [www.fao.org/statistics](http://www.fao.org/statistics) for the years from 1980 to 2011.

**Table 8: Trend Analysis of Prices of Coffee and Related Commodities**

Commodity	Peaks	Dips	Upward Movement	Downward Movement	Nature of Cycle
Coffee	1995, 2011	2001 and minor dip in 2009	2001-08 2009-11	1997-01 2008-09	Long cycles of 5-6 years observed.
Cardamom	1993, 2001	1992, 1996	1998-01 2009-11	1993-96	No clear cycles observed.
Orange	1998	Small dip in 2000	1991-2000	1998-00	No cycle observed. Upward trend from 1991-99
Pepper	1999	2004	1991-99	1999-04	Long cycles of 8 years
Rice	2008	Small dip in 1997 and 2003	1991-96 2005-08	1996-97 2004-05	Steady Upward trend since 1991. No cycle observed
Ginger	1994, 1998, 2003	1996, 2002, 2005	1996-97 2002-03	1994-1996	Short cycles of 2-3 years
Areca nut	2000	1992, 2001	1992-00	Not seen other than minor dips	No cycle observed. Constant upward trend from 1992-2000

*cont'd.....*

Commodity	Peaks	Dips	Upward Movement	Downward Movement	Nature of Cycle
Banana	1998	Minor dip in 2000	1991-99	1999-00	No cycles observed
Coconut	1991, 1997	1995	1995-97	1993-95	Short cycles of 2-3 years
Natural Rubber	1996	1999	1991-96	1996-00	5-6 years cycles

Compiled from FAO database: [www.fao.org/statistics](http://www.fao.org/statistics), for the years from 1990-2011 (data for some commodities is missing for some years).

coffee with that of pepper and cardamom is not seen. Yield of coffee had been stagnant and steadily declining since the early 2000. Coffee has experienced a downward cycle in the period from 2002-09, the period which has largely experienced a continuous upward trend in the yield of cardamom. Yield of pepper showed an upward movement in the years from 1991 to 2006 and a fall for four years after that up to 2009. Commodities like rice, ginger, arecanut, banana and rubber have more or less steady trend in yields with no cycle being observed.

Similarly, with respect to price trends, a long cycle of 5-6 years is observed for coffee and a longer cycle of 7-8 years for pepper and no cycle is evident for cardamom. Coffee price had peaked in the years 1995 and 2011 and dipped in the year 2001. It has shown a declining cycle during the years 1997 to 2002 and upward movement in the years 2001-08 and 2009-11. Whereas cardamom showed peaks in prices in the years 1993 and 2001 and dips in 1996 and 2002. There was a downward movement from the period 1993-96 and upward movement from 1998-2001. Similarly, pepper prices peaked in 1994 and 1999 and dipped in 1991 and 2004. There was a downward movement for the period from 1999-2004 and upward movement from 1991-1999. Prices of orange, rice, ginger and arecanut seem to be having an upward trend since 1990s. Here again it is evident that the major crops that are grown with coffee have different price cycles with respect to the amplitude of the cycle and duration of the cycle. Therefore, one can conclude that diversification of commodities would certainly act as hedge against the yield and price risk, the two major risks that may have a bearing on the income risks of the farmers. But as observed from the field, at a farm level, the constraints towards diversification of crops are many, especially, those pertaining to scale economies and the threat of diseases with the rising cost of cultivation. Hence, a policy intervention towards this would help in a long run sustainability of coffee cultivation. The role of the Coffee Board and Spices Board should, therefore, be seen in totality working with more co-ordination across the departments.

The analysis in this study is limited to price and yield risks at a macro level and has not considered the cost of production variable. Analysing diversification at the farm level with its impact on the net income of the farmers and its role in hedging risk would be more appropriate which would be carried out in the next phase of the study.

## **8. Conclusion and Policy Implications**

Coffee cultivation in India, like in many parts of the world is carried out by small and marginal cultivators. Small holding cultivation combined with the external reliance for markets have posed coffee cultivators to risk at different levels. An attempt was made to understand, analyse and map various risks faced by small coffee growers through the study conducted in the Kodagu, Karnataka. Available secondary literature and primary study through focus group discussions with important stakeholders was the basis of this study. The discussion with various stakeholders including the planters, members of planter's association, curers etc., revealed several types of risk the small growers are exposed to.

At farm level the planter has to deal with various types of diseases associated with coffee. This not only increases the cost of cultivation, but yield risk in such situation is very high. Absence of adequate and timely extension service further accentuates this risk. Absence of adequate irrigation facilities also enhances the uncertainty with rainfall especially the blossom shower that planters look forward to. Other farm level risks are associated with availability of labour, casualisation of labour and rising cost of cultivation. Small growers in certain areas of Madikeri have been following the customary form of reciprocity in labour sharing which minimizes the risk associated with small growers. However, this practice is limited to some pockets.

Policy and regulatory barriers related risks affect the planters though these are not uniform across regions. In turn, these affect the

competitiveness of the farm. Coffee prices being determined by global market trend, such policies are to be compared globally. Export subsidy, if provided some advantage to the coffee grower, the Pollution Control Board regulation or minimum wage norms would put the planter in a disadvantageous situation. As we observed the specific regulation relating to pulping activities by Karnataka State Pollution Control Board enhances the cost of pulping activity. If this regulation were to fetch a premium market price for responsible agriculture, the planters would have willfully adopted the method. However, in the absence of any such price discrimination, the planters stand less competitive within the country as well as globally.

The third dimension of risk that we discussed in marketing risk includes the risks related to price volatility, external factors and the supply chain. As we observed, global demand and supply situation reflected in London and New York commodity markets determines the farm gate prices. Adding to this is the volatility in exchange rate on which the planter does not have any control. In addition, small growers also sell the product at a depressed price if there is interlocking of product market with credit market. The buyer-driven supply chain leaves the planter with little choice on price.

Once understood these risks, we analysed crop diversification in the region and its impact on minimising the risks. Herfindhal index of 0.37 suggested that a good amount of diversification is seen at a district level. However, this diversification at the regional level may not be reflected at farm level. Though through personal interview we observed that many farmers have diversified crops on their fields, a proper analysis is possible only with adequate sample survey. It was also observed that the constraints to diversification of crops are many. Attack of diseases, economies of scale, and policy measures have acted as disincentives towards diversification. Analysing the yield and price trends of coffee and other crops grown in Kodagu district, we find that a combination of

crop would minimise the income risk of the planters. Especially, cardamom and pepper add to the portfolio of crops in addressing risk.

Having mapped the risks among coffee growers and understanding the severity of the problems calls for certain policy interventions, which if properly addressed might help in mitigating some of the risks faced by the farmers. To mention some of them, there is an urgent need to enhance the R&D efforts of Coffee Board and Spices Board to control the kind of diseases that afflict coffee and other crops in the region. Though some of the measures are seen in the official websites of these Boards its access is highly limited to small farmers. There is a need for transferring the technology at the field level through arriving at efficient extension services. Tie-ups with the local bodies and non-governmental organisations for such activities would be one of the effective alternatives. Intervention by forest officials in addressing the problem of wild animals is an immediate requirement. Despite the output loss due to the attack by forest animals, there has been no effort from the part of the government/forest department to tackle it. The area under irrigation being only 2.28 percent of net sown area calls for the extension of irrigation facilities in the region. Educating the farmers by the Boards on water harvesting, and sustainable means of irrigation would lead to efficient results. The subsidies provided by the Coffee Board and Spices Board on acreage basis needs to be worked in co-ordination so that the farmers avail sufficient crop specific subsidies for cultivation. The administering mechanism of the subsidies by the Boards needs to be made more efficient to avoid leakages and misuse of subsidies to other consumption purposes. Setting up of vocational training centres by the Boards/government for developing skills pertaining to pruning of shade trees, climbing of coconut trees and plucking of pepper from tall trees, etc would ensure some availability of labour in the future.

Shortage of labour being the most crucial of the input problems faced by the farmers in Kodagu an urgent need to move towards cost

effective and crop specific mechanisation is essential. Educating the farmers on advantages of mechanisation and its uses should be treated as the part of extension services by the Coffee Board and Spices Board. Though MGNREGA programme has created 16.55 lakh man days of employment in the year 2010-11, linking of MGNREGA for plantation labour could provide some relief to the problem of labour shortage to some extent. A relook into the Plantation Labour Act to make it advantageous to both the farmers and the labourers is called upon so that it leads to more formalisation of the labour market.

To address the marketing risks, a seller driven supply chain would be useful in resisting the price related risks associated with the growers. Asymmetry of information lies not just with the information on prices but largely on information pertaining to the complexities in the supply chain. It is a known fact that a co-operative system has acted in favour of farmers in case of many agricultural commodities and a solution to the anticompetitive practices of the traders can largely lie with the formation of co-operatives. There is, however, absence of leadership in the region to evolve the co-operative movement in the region. There are possible alternatives in terms of coffee marketing co-operatives or local auction markets that can help creating a seller led supply chain process. These alternatives, however, need to be analysed to identify appropriate institutional response to price related risks.

The other way to minimise risk would be to promote crop diversification by the existing Boards. From the price and yield trends of coffee and related commodities, it is evident that these commodities have different price and yield cycles, dips and peaks and therefore, would act as a hedge against price and yield risks. It is however important to promote diversification of crops at farm level. Attempts made to address crop related issues by Coffee Board, Spice Board and horticulture department hardly promotes crop diversification. It is essential that these Boards work in tandem to promote diversification of crops in the region.



This study however has the limitation of analysing diversification in a regional level. A more detailed analysis on farm level diversification with a sample survey through analysing the cost of cultivation at the farm level is called for.

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