

**REGIONAL VARIATIONS IN  
THE PERFORMANCE OF BLACK PEPPER  
CULTIVATION IN KERALA:  
AN EXPLORATION OF NON PRICE  
FACTORS**

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## **ABSTRACT**

It is often argued that the performance of agricultural sector is influenced by number factors- both price and non-price. Studies on Kerala agriculture have shown that, driven by these factors, the cropping pattern in Kerala has undergone major changes which inter alia included a shift away from food crops to commercial crops. The key question however arises here is, whether the performance of these crops in terms of area, production and yield in Kerala varied across regions and the influencing factors therein. Since the markets are highly integrated, the role of price factors is expected to be minimal. Hence the present paper undertakes an analysis on the cultivation of Black pepper in Kerala with a view to explore the role of non price factors especially the institutional arrangements, behind the acreage decision of pepper growers and the enhancement of pepper production in Kerala. Drawing from the analysis of available secondary data and primary survey in Idukki and Wayanad, the study presents evidences for regional variation in acreage allocation towards black pepper in Kerala especially in northern and central Kerala. The failure of institutional support at proper time and the lack of coordination among agencies concerned lead the growers to move away from black pepper to other commercial crops. Drawing from its findings, the study calls for more intense institutional intervention and highlights the need for better coordination among various agencies to provide the extension services and support at the proper time to the pepper growers.

## 1. Introduction

One of the characteristic features of Kerala's agriculture sector is its commercialisation which has had a long history with Kerala economy (Raj, 1985). However, the extreme diversity in the bio-physical resource base and agro-climatic endowments in Kerala provides opportunities to raise variety of crops like paddy, cassava, coconut, rubber, pepper, cardamom, ginger, arecanut, tea, coffee etc across the state (Mahesh, 1999; George, 2005). Followed by the implementation of one of the institutional reforms (in the form of land reforms) during mid 1960s in the state had resulted a number of changes in the agriculture sectors in terms of land utilisation and cropping pattern. As a consequence, there has been a considerable increase in the number of operational land holdings led to the proliferation of marginal and small holdings in the state. Alongside, there was a tremendous increase in the area under cultivation of commercial crops such as coconut, rubber, black pepper, arecanut etc which is of less labour intensive and high value nature and a corresponding decline in the area under traditionally cultivated food crops such as rice, cassava etc. Studies have seen this cropping pattern change in the context of scarcity and high cost of agricultural labour and the changes in market forces in favour of commercial crops<sup>1</sup> (Kannan and Pushpangadan, 1989; Joseph and Joseph, 2005; George, 2005; Economic Review, 2010). Although most of the crops are grown all over the state, regional specialisation exists in the case of some crops (Kannan

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1 The share of area under annual and perennial crops in the state has increased from 54.3 per cent in 1980-81 to 76.1 per cent in 2009-10. Many of these crops are categorised as commercial crops (Author's calculation based on the data from Agricultural Statistics, Department of Economics and Statistics).

& Pushpangadan, 1988). This spatial variation in the production function of different crops was explained in the context of variation in several environmental factors such as rainfall, topography, altitude, climate, soil type etc (Joseph, 1979) and differences in resource endowments, climate, topography and the changes in historical, institutional and socio economic factors exist across the country (Chand *et al.*, 2009; Chand, 2011). Nonetheless, regional variations in the factors can have the capability to decide the performance of different crops (Chand, *et al* 2011). In this context, the present paper undertakes a regional analysis on the performance of commercial crops in Kerala by taking black pepper as a special case.

Black Pepper is one of the most ancient and traditional spice crops of India which has been produced and traded worldwide. In 1951, 70 per cent of world's pepper cultivation was concentrated in India and this has gone down to 18.7 per cent in 2007. Furthermore, the distribution pattern of pepper across various states of India showed the dominance of Kerala with 89 per cent of the total area under cultivation and produces around 95 per cent during 2007-08 followed by Karnataka and Tamil Nadu. Obviously, any downturn in Kerala's production is bound to have a negative impact on country's production. Moreover, black pepper is cultivated mostly by small and marginal holders and their livelihood has crucial bearing on this crop. As we can see from a government report on black pepper says that "black pepper is one of the important crops which provides a major source of income and employment for rural households in Kerala- where more than 2.5 lakh farm families are involved in pepper cultivation" (Government of India, 2009). In a context whereby, the declined performance<sup>2</sup> recorded in recent years by this spice crop in the state in general and comparison with other commercial crops in

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2 Black pepper had experienced a highest decline in area (negative growth) under cultivation as compared to other commercial crops such as coconut, cardamom, arecanut etc (Author's Calculation on the basis of Agricultural Statistics).

particular, added up relevance to this particular issue. Against this background, it would be imperative to explore whether the performance to black pepper in terms of area, production and yield in Kerala across regions is unique or not. If not, then, what are the underlying factors behind this phenomenon? In a setup where markets are getting integrated with world market, (Anoopkumar, 2011), the role of non price factors especially the institutional arrangements, behind the acreage decision of pepper growers and the enhancement of pepper production in Kerala assumes importance.

The rest of the paper is structured as follows. Apart from the introduction, the paper will have four more sections. Section 2 will discuss about the analytical framework of the paper. Section 3 briefly discusses the methodology and data sources employed to realise the issue at hand. Section 4 presents the results of the analyses followed by discussion on it. The last section summarizes the major findings.

## **2. Analytical Framework**

Economic theory rests on and takes as its starting point the assumption that each economic subject tries to maximise his own individual gain, that profit motivation governs the behaviour of producers. Generally in agriculture, the biological nature of the production process makes for a considerable lag between production inputs and outputs which vary from one crop to another. In this situation, the allocation decision of the farmers regarding available limited land resources under various crops which can be seasonal, annual or perennial will have a long-term implication on the income of the farmer. Hence, the allocation of any factor of production like land, needless to say, is governed by the perceived return from the investment. This return in turn depends upon price, yield (production/ha), cost of production, agro climatic conditions etc. Assuming that the agro- climatic conditions are exogenous, we are left with the first three factors. The price of commodities like black pepper, as studies has shown, in the globalised

world is determined in the world market and gets transmitted to the local market as they are highly integrated today. Nonetheless, the actual farm gate price could be governed also by the farmers. If the markets are not competitive and exploitative, one could visualize a situation where high traders margin where in the share of producers' in consumer rupee is negligible. To the extent that marketing environment is influenced to a great extent by the institutional arrangement for marketing including the policies of the state. It could be argued that institutional factors do play a role in the price. The role of institutional factors becomes more important when it comes to yield and cost of production say for example, in the case of yield, studies have shown the role of farmers' access to HYVs. Furthermore, government investment in infrastructure, research and extension, price and other policies along with strategies for crop, livestock and fisheries production have significantly helped to increase food production and its availability. Thus viewed the role of institutional factors in governing the yield of a particular crop is evident when it comes to cost of cultivation, while the price factors in the form of cost of fertilizers and pesticides are important in our country and these prices are governed by state policies. On the whole, despite the withdrawal of the state, one could argue that institutional factors do play an important role in influencing the farmers' decision regarding the allocation of resources. In other words, market and price of a crop produce is governed by the institutional context which include processing and post harvesting facilities available to the farmers, regulatory environment and other supporting infrastructure in the form of research and extension that the farmers need. Here one could argue that both market and non market forces are highly intertwined. Moreover these factors do vary across different crops. Hence a proper understanding of the factors influencing the performance of agriculture in general would call for detailed analysis of both market (price) and non market (institutional) factors by taking the case of specific crops. The present study has to be seen in this context.



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

The paper is based on both primary and secondary data. Secondary data are collected from various government sources to realize the objective at the macro level. To examine the performance of black pepper in Kerala in general and for regions in particular, the study has been using state level time series data on area, production and productivity of crop in Kerala from 1960-61 to 2009-10. To understand the regional pattern in detail, the paper has used regional classification made by Government of Kerala. The state is divided into three regional groups on the basis of geographical, historical and cultural similarities- Northern Kerala comprises of five districts (Kasaragod, Kannur, Wayanad, Kozhikode and Malappuram), Central Kerala comprises of four districts (Palakkad, Thrissur, Ernakulam and Idukki) and Southern Kerala comprises of five districts (Kottayam, Pathanamthitta, Alappuzha, Kollam and Thiruvananthapuram).

To explore the issue of variation in the performance across regions, the study has collected primary data using a structured interview schedule. The study covered a sample of 180 households spread across two districts; namely, Idukki and Wayanad; in the state where black pepper grow plenty. Both qualitative and quantitative information has been gathered for the purpose of the study. The samples were drawn by using proportionate stratified random sampling method.

The paper, in addition to the descriptive statistical tools, made use of the kinked exponential model developed by Boyce (1986) to arrive at the trend break (Balakrishnan and Parameswaran, 2007) in different series and exponential growth model to estimate the growth rates. To examine the contribution of area and yield to output, the study used the conventional decomposition analysis.

#### **A Brief Description of Idukki and Wayanad**

Idukki is one of the mountainous Districts of Kerala, came into being on 26<sup>th</sup> January 1972. With a total geographical area of 5,019

square kilometers (13 percent of the total area of the state) the District of Idukki falls mainly on upland area. Topographically, Idukki district is divided into two divisions. No part of the district lies in low land. The average rainfall receives in the district is 2867.9 mm and the temperature varies between 27<sup>0</sup> C and 21<sup>0</sup> C. The soils of this district are classified into laterite, forest and hilly soils. The major crops grown in the district are cardamom, black pepper, tea, coffee coconut. Out of the four taluks in the district viz. Devikulam, Udumbanchola, Peerumedu and Thodupuzha, the present study has chosen two Panchayats from Udumbanchola taluks- Nedumkandam and Erattayar.

On the other hand, Wayanad district came into existence on 1<sup>st</sup> November, 1980 as the 12th district of the state. The district has an area of 2131 sq. kms, which account for 5.48 percent of the state total. Being a hilly district, vast areas of Wayanad consists of forests (36.48 percent). Nearly 51.04 percent of the total area of the district is under cultivation. The agro- climatic conditions of Wayanad are as follows: a) the average rainfall that the district receives during the year is 1938 .9 mm b) During the cold season temperature falls below 15<sup>0</sup> Celsius, but in the summer season a temperature of 29<sup>0</sup> Celsius and more is often recorded. From October to the end of February the atmosphere become dry, cool and salubrious. The seasonal crops that require heavy rainfall and perennial crops that require prolonged rainfall can have a healthy growth in the district. The high altitude in the district is suitable for the cultivation of perennial plantation crops and spices. The major plantation crops include coffee, tea, black pepper, cardamom and rubber. Among three taluks in the district, Sulthan Bathery, Mananthavady and Kalpetta, the study has chosen two panchayats- Pulpally and Mullankolly from Sulthan Bathery taluk for further analysis.

#### **4. Results and Discussion**

This section has been divided into two parts. Firstly, it will examine the general trends and pattern of black pepper cultivation across regions

in particular and Kerala in general. The second section will explain in detail the issue of role of non price factors in the cultivation of black pepper in two sample districts, Idukki and Wayanad.

Considering the fact that the cultivation of black pepper is spread over different regions in the state, with a view to have a better understanding of its observed performance, we shall now examine the variations in area, production and yield of black pepper during the last five decades<sup>3</sup> (1960-61 to 2009-10) for Kerala in general and regions in particular.

### Trends in Area

Region-wise area under black pepper (in absolute terms) and as a percentage of state's net sown area (which is one of the indicators to understand agricultural development in any state) is presented in Table 1.

**Table 1: Region Wise Trend in Area (000'ha) under Black Pepper in Kerala**

Regions	1960-62	1970-72	1980-82	1990-92	2000-02	2007-09
Southern Kerala	29.3 (3.65)	33.9 (4.12)	32.8 (6.06)	29.9 (4.44)	33.3 (5.18)	27.9 (4.65)
Central Kerala	11 (1.89)	10.7 (1.69)	24.5 (4.33)	52.9 (7.13)	78.2 (10.56)	86.4 (12.42)
Northern Kerala	59.3 (10.31)	72.2 (10.70)	50.6 (8.78)	93.9 (11.29)	93.4 (11.51)	52.7 (6.67)
Kerala	99.4 (5.07)	116.7 (5.48)	107.9 (6.41)	176.7 (7.86)	204.9 (9.33)	167 (8.01)

Source: Various Issues of Agricultural Statistics, Department of Economics and Statistics, Kerala

Note: Figures in parentheses are the Percentage Share to Net Sown Area.

3 The present study has been using decadal wise Triennium Ending (TE) average from 1960-61 to 2012-13 to examine the regional trends and pattern of area, production and yield of black pepper in Kerala. Triennium ending average is mainly employed to reduce the year to year fluctuation levels.

The table further reveals that the three regions we considered in this study contributed differently to the observed trend at the state level. In case of Central Kerala there was a steady increase in the area under cultivation. To be more specific, the area under cultivation increased from 11 thousand hectares during the first period to over 86 thousand hectares during the last period and recorded an increase of 684.2 per cent during the four decades under consideration. But when it comes to other two regions, we observe a different picture. In case of southern Kerala, the area under cultivation increased during the first two periods but it record a decline of nearly 1.1 thousand hectares during the third period. Though the area lost during the third period was almost recovered during the fourth period, as we move to the final period, there was decline of nearly over five thousand hectares (see Table 1).

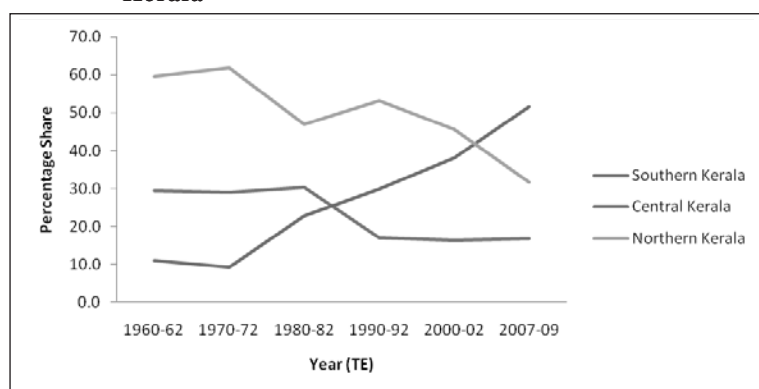
The variation in the area under cultivation in northern Kerala was more pronounced. During the first period, northern Kerala held major share in area under black pepper cultivation that is 59.3 thousand hectares which increased to 72.2 thousand hectares in the second period. While in 1980-82, area recorded marked a decline of 21.6 thousand hectares and reached to 50.6 thousand hectares. But in 1990-92, northern Kerala's area under cultivation has increased to 93.9 thousand hectares and remained at this level till 2000-02. As we move to the final period, there is a significant decline of area by 40.7 thousand hectares (-43.51 per cent change) and reached 52.7 thousand hectares – even lower than that in 1960-62. Thus the decline in area under cultivation in Kerala is mostly on account of the decline in the northern region and to a limited extent that in the southern region.

If we consider the share of area under black pepper cultivation to the total net sown are for all the regions, Central Kerala has recorded a steady increase from 1.89 per cent in 1960-62 (TE) to 12.42 per cent in 2007-09 (TE). This region has made a substantial progress as compared to other regions of the state. However, northern Kerala has experienced

an increase in the share of black pepper during the earlier periods; there was a drastic decline in the share as we move from the fourth to fifth period (from 11.5 per cent to 6.7 per cent). In the case of Southern Kerala, the relative share has made an increase from 3.65 per cent in 1960-62 to 6.06 per cent in 1980-82 (TE), while in the rest of the period; the share has recorded a fluctuation (see Table 1). Overall state trend shows that, the share to net sown area has increased from 5.07 per cent in 1960-62 to 9.33 per cent in 2000-02 (TE) and then decline to 8.01 per cent in the fifth period.

From the above discussion it is evident that there occurred wide variations across regions in area under cultivation of black pepper in the state. Moreover, contribution of area by northern region towards state level has recorded a decline since 1990, whereas central Kerala has made a substantial increase in area under cultivation throughout the time period. In this context, it would be insightful to examine the region wise percentage share of area under black pepper to the state from 1960-62 to 2007-09 to get the variation in detail.

**Figure 1: Share of Different Regions in Area under Black Pepper to Kerala**



Source: Various Issues of Agricultural Statistics, Department of Economics and Statistics, Kerala.

Change in the share of different regions in area under black pepper could be clearly observed from Figure 1. From 1970-72 (TE) onwards, share of central Kerala in net sown area has increased substantially. Though northern Kerala registered a steep decline after 1990s, this region contributed more to state's area till 2000 as compared to other regions. But the situation has entirely changed after 2000. During this period, area under central Kerala further increased to account for the major share in the state. Though Southern Kerala has made a steep decline between 1980-82 (TE) and 1990-92 (TE), this region recorded more or less stagnant performance after 1990s. But northern and central Kerala has recorded a contrasting performance in terms of area allocation throughout the reference period. This indicates the evidence for regional variation occurred in the acreage allocation under black pepper cultivation during the period under consideration in the state. Having examined the trends and pattern of area under cultivation, let us now proceed to examine the region wise performance of black pepper in terms of production.

### **Trends in Production**

The production of black pepper in Kerala for the year 1960-62 was 26.2 thousand tonnes and increased to 39.5 thousand tonnes in 2007-09. Detailed information on production of black pepper across regions is given in Table 2. It is evident from the figure that production in central Kerala in 1960-62 was only 3.5 thousand tonnes, which was a little more than one-third of that in southern (11.2 thousand tonnes) and northern (11.4 thousand tonnes) regions. In the second period, both northern (10.3 thousand tonnes) and central (3.1 thousand tonnes) regions in particular and state in general, exhibited a slight decline in production level as compared to first period. Southern Kerala showed an increase of 5 tonnes in the second period which was decreased by 4.4 thousand tonnes and reached to 7.3 thousand tonnes in 1980-82. The production level in both northern (15.9 thousand tonnes) and central

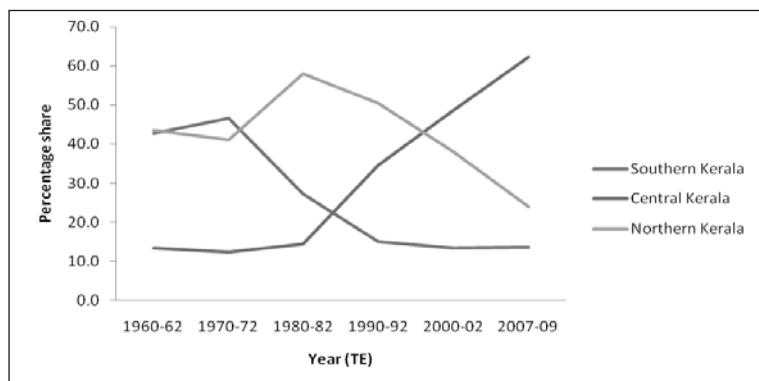
(3.9 thousand tonnes) regions has recorded an increase of 5.6 thousand tonnes and 8 tonnes in 1980-82. As in the fourth period (1990-92), southern region experienced a stagnant performance whereas other two regions have recorded an increase in its production level which shifted the state's production of black pepper upward from 26.9 thousand tonnes in 1980-82 to 48.9 thousand tonnes in 1990-92. However by 2000-02 state's production level has recorded an upward trend and reached 62.2 thousand tonnes. In this period, production in central and southern Kerala has made an increase, while northern Kerala has experienced a slight decline of 1.1 thousand tonnes and reached to 23.6 thousand tonnes from 24.7 thousand tonnes from 1990-92. But in 2007-09, the situation has entirely changed. All the regions has showed evidence of decline in level of production of black pepper, which pulled the state's production to 39.5 thousand tonnes in 2007-09 and experienced a decline of 22.7 thousand tonnes within 10 years. Highest decline has been experienced by northern Kerala with a decrease of 14.1 thousand tonnes and reached to 9.5 thousand tonnes in 2007-08. The decline recorded by other two regions in the recent past is evident from Table 2.

**Table 2: Region Wise Trend in Production (000' tonnes) under Black Pepper in Kerala**

Regions	1960-62	1970-72	1980-82	1990-92	2000-02	2007-09
Southern Kerala	11.2	11.7	7.3	7.3	8.3	5.4
Central Kerala	3.5	3.1	3.9	16.9	30.2	24.6
Northern Kerala	11.4	10.3	15.6	24.7	23.6	9.5
Kerala	26.2	25.1	26.9	48.9	62.2	39.5

Source: Various Issues of Agricultural Statistics, Department of Economics and Statistics, Kerala.

**Figure 2: Share of Different Regions in Production of Black Pepper in Kerala**



Source: Various Issues of Agricultural Statistics, Department of Economics and Statistics, Kerala.

In a context wherein area as well as production has declined for both northern and southern Kerala in the state, has reduced the state's share in both area and production during 2007-09. The distinct performance showed by central Kerala that steady increase in area coupled with a decline in production level (in absolute terms) calls for the examination of trends in yield level of black pepper across regions. In this setting, how far the yield levels are responsive to production fall is examined in the coming section.

**Table 3: Average Yield of Black Pepper in Different Regions in Kerala (kg/ha).**

Regions	1960-62	1970-72	1980-82	1990-92	2000-02	2007-09
Southern Kerala	383	346	223	245	249	193
Central Kerala	320	287	159	320	384	284
Northern Kerala	192	143	309	263	253	183
Kerala	263	215	249	277	303	236

Source: Own Calculation based on Various Issues of Agricultural Statistics, Department of Economics and Statistics, Kerala.



It has been noted that Kerala has recorded a decline in yield from 263 kg/ha in 1960-62 to 249 kg/ha in 1980-82. After 80s, yield started increasing and reached the peak level of 303 kg/ha in 2000-02. While in the final period, average yield of the state has come down and reached to 236 kg/ha which is lower than 1960-62 level. Coming to region wise trend, though regions exhibit a divergent performance in the average yield level till 2000, one could observe a decline in the average yield of black pepper in all the regions after 2000 (Table 3).

From the above analyses, we could observe that the three regions performed distinctly from each other in terms of area and production (in absolute terms). The major difference is recorded between central and northern Kerala. In this situation, examination of growth rates registered for area, production and yield of black pepper across regions over the last five decades would provide a better understanding of the pace that registered. Growth rates has been calculated and explained in next section.

Before getting into the exploration on the pace of growth in area, production and yield of black pepper, it would be helpful to identify to the break points. But the figures on the same show a wide fluctuation throughout the reference period. This calls for the analysis to identify the unknown break points in area, production and yield of black pepper across regions and state as a whole from 1960-61 to 2009-10. Table 4 presents the structural break years in area, production and yield of black pepper for the period 1960-61 to 2009-10.

The Table 4 reveals that Kerala has recorded two breaks in area and production on similar years with three phases of growth, while for yield the state experienced only one break point at 1986 with two phases of growth. Among regions, we can see that northern Kerala experienced three breaks in area with four phases of growth, while the rest two regions has recorded two breaks in the area. It is clear from the table that Kerala in general and regions in particular has experienced a break during 1999. Similarly for production also all the regions except central Kerala

**Table 4 : Region wise Estimated Breaks in Area, Production and yield of Black Pepper in Kerala: 1960- 2009**

Break	Southern Kerala	Central Kerala	Northern Kerala	Kerala
<b>Area</b>				
1 <sup>st</sup> Break	1972	1972	1972	1986
2 <sup>nd</sup> Break	1999	1985	1986	1999
3 <sup>rd</sup> Break	-	-	1999	-
<b>Production</b>				
1 <sup>st</sup> Break	1975	1986	1989	1986
2 <sup>nd</sup> Break	1999	-	1999	1999
<b>Yield</b>				
1 <sup>st</sup> Break	1984	1986	1986	1986
2 <sup>nd</sup> Break	-	-	1999	-

and for the state as such, break has occurred in 1999. Among the average yield level, northern Kerala has experienced two breaks with three phases of growth. We find a common break in mid 80s for all the regions along with state. The rate of growth in area, production and yield during identified break points are presented in Table 5.

Table 5 shows that the growth rate of black pepper in terms of area, production and yield for central and northern Kerala in particular and Kerala in general has declined after 1999. Northern Kerala has recorded a steep decline in area under cultivation after 1999 from 0.6 per cent growth in 1987- 99 to -6.7 per cent growth in 2000 -09. Though the pace of growth rate in central Kerala in terms of area has reduced, it still recorded positive growth rate in the area under cultivation. Coming to the growth rate of production, all the regions have recorded a negative growth rate in the recent decade. Both central (from 4.7 per cent in 1960- 1986 to -8.1 per cent in 1987-2009) and northern (5.7 per cent in 1990-1999 to -10.2 per cent in 2000- 2009) regions has experienced drastic decline in the production growth rate. Coming to the yield growth,

southern and central Kerala has experienced a positive growth while northern Kerala recorded a negative growth. But the pace of growth rate has come down from -7 per cent to -0.5 per cent in northern Kerala.

**Table 5: Rate of Growth in Area, Production and Yield during Break Period**

Break	Southern Kerala	Central Kerala	Northern Kerala	Kerala
<b>Area</b>				
1 <sup>st</sup> Break	2.27 (1960-1972)	15.8 (1960-1972)	0.2 (1960-1972)	0.86 (1960-1986)
2 <sup>nd</sup> Break	-0.58 (1973-1999)	7.9 (1973-1985)	-0.85 (1973-1986)	4.5 (1987-1999)
3 <sup>rd</sup> Break	0.74 (2000-2009)	4.6 (1986-2009)	0.6 (1987-1999)	-1.4 (1999-2009)
4 <sup>th</sup> Break			-6.7 (2000-2009)	
<b>Production</b>				
1 <sup>st</sup> Break	-2.5 (1960-1975)	4.7 (1960-1986)	2.7 (1960-1989)	1.1 (1960-1986)
2 <sup>nd</sup> Break	-0.56 (1976-1999)	-8.1 (1987-2009)	5.7 (1990-1999)	7.1 (1987-1999)
3 <sup>rd</sup> Break	-0.74 (2000-2009)		-10.2 (2000-2009)	-37.3 (2000-2009)
<b>Yield</b>				
1 <sup>st</sup> Break	-4.9 (1960-1984)	-0.95 (1960-1986)	-5.2 (1960-1969)	0.61 (1960-1986)
2 <sup>nd</sup> Break	2.7 (1985-2009)	3.1 (1987-2009)	-7 (1970-1981)	0.75 (1987-2009)
3 <sup>rd</sup> Break			-0.5 (1982-2009)	

## Decomposition Analysis

**Table 6: Contribution of area and yield to change in production on Black Pepper in Kerala**

Southern Kerala		Central Kerala		Northern Kerala		Kerala	
Period	Effect	Period	Effect	Period	Effect	Period	Effect
1960-75	YE	1960-86	AE	1960-89	YE	1960-86	AE
1976-99	AE	1987-09	AE	1990-99	AE	1987-99	AE
2000-09	YE	Nil	Nil	2000-09	AE	2000-09	YE , AE

Note: AE- Area Effect, YE- Yield Effect

Decomposition analysis of Kerala shows that in the first two break periods (1986 & 1999), area's contribution is more to production than yield, But after 1999, both yield and area effect becomes the dominating force in production changes over area effect, which led to decline the production by 37.3 per cent.

More specifically, decomposition analysis suggests that area has contributed more to production level in central Kerala from 1960-61 to 2009-10 and for northern Kerala from 1990-91 to 2009-10, where black pepper is cultivated more in the state. However for state as a whole and southern Kerala in particular, yield effect is dominating in the recent decade in production.

Southern Kerala recorded a decline in production growth rate throughout the reference period. During the first break (1960-75), production growth rate was negative (-2.5 per cent). In this period, decomposition analysis shows that yield has contributed more to production than area. Growth rate in yield shows a negative value (-4.9 per cent), though area has showed a positive growth rate (2.27 per cent). This result suggest that decline in production level is mainly due to decline in the yield rate. In the second break (1976-99), the pace of decline in production has reduced by 1.96 per cent and started decline by 0.56 annually. During this period, both yield and area experienced negative growth, but area has contributed more to production than yield

because pace of yield decline is 4.32 per cent higher than area decline. After the final break point (1999), decomposition effect shows the dominance of yield effect on production than area. This phenomenon is mainly due to positive growth rate of yield (2.7 per cent after 1985) over positive growth rate of area (0.74 per cent after 2000).

Decomposition analysis suggests that area effect has contributed more to production than yield throughout the reference period. It has been noted that central Kerala has recorded a positive growth rate throughout the period from 1960-61 to 2009-10. During the first break (1986), production has increased by 4.7 per cent and there registered the influence of area effect on production than yield. In this period, area has recorded 15.8 per cent growth rate which is higher than yield has experienced a negative growth (-0.95 per cent). But after the break in 1986, production growth rate become negative (-8.1 per cent) due to decline in the pace of area growth rate (see Table 5). Though yield registered a positive growth rate during the same period, the pace of decline occurred for area growth rate is very high as compared to the positive growth experienced by yield. But area growth rate has still showed a positive figure which is shown in Table 5.

During 1960-89, the production growth (2.7 per cent) was mainly due to yield effect (-5.2 per cent) than area effect. But after 1990, production growth has increased by 5.7 per cent mainly due to the positive growth rate in area (0.6 per cent) (see Table 5). In this period, growth rate of yield become negative (-0.5 per cent). In the third break point (after 2000), production has recorded highest decline of 10.2 per cent, which is quite higher as compared to other two regions experience on decline in production. This decline is mainly contributed by area, which has recorded a decline of -6.7 per cent after 2000 that yield (-0.5 per cent).

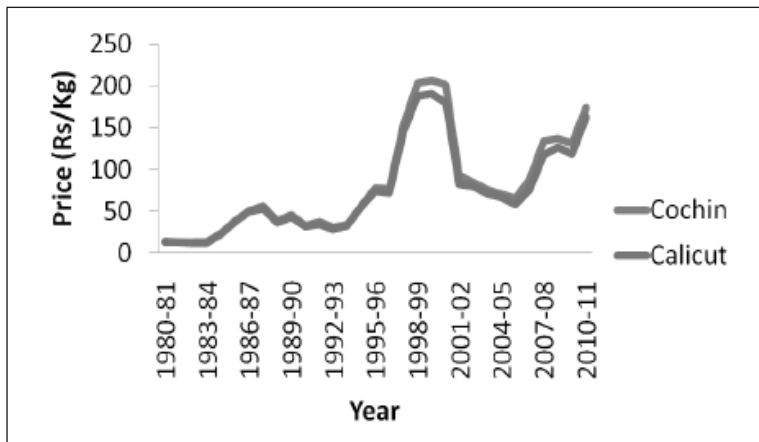
From the above analyses, we observed the performance of black pepper in the state which is different from other commercial crops.

Moreover the intra state performance of the crop revealed the experience of divergent trend in terms of acreage allocation across northern and central Kerala. More specifically, northern Kerala exhibits a reduction (from 90s) while central Kerala exhibits an upward trend in area under cultivation of black pepper since 1980. This leads to the further exploration of factors responsible for this trend. To understand the problem in detail, the study examines the role of price and non price factors especially institutional arrangements in the case of black pepper.

### Trends in Prices

Historically, black pepper is a highly tradable commodity; its domestic price, production as well as profitability are highly influenced by its international prices (Kumar & Singh, 2007). Figure 3 exhibits the average market whole sale prices of black pepper for Cochin and Calicut from 1980-81 to 2010-11. It shows that price in both the markets are moved more or less same pattern, though it recorded wide fluctuations over the years. Thus, it paves the way to explore the role of non price factors especially institutional arrangements in black pepper production

**Figure 3: Average Whole Sale Price of Black Pepper in two leading Markets in Kerala (1980-2010)**



Source: Spice Statistics, Various Issues, Spices Board.

## **Non Price Factors- An Exploration**

It has been widely discussed in the literature that output can be varied by the influence of several non price factors. These factors includes irrigation, availability of credit, agricultural insurance, network of research and extension services, supply of inputs (both local and HYVs), provision of storage and marketing facilities, research and developmental activities, training provided by the extension officers, climatic change and pest and disease attacks (Mansur & Muhtar, 1987; Rao & Jeromi, 2000; Balakrishnan *et al.*, 2008; Aydinalp & Creese, 2008; among others). These are some of the non price factors where the role of institutional arrangements can be traced out.

### ***Credit***

Credit is one of the critical non-land inputs, which has two dimensions from the view point of its contribution to the augmentation of agricultural growth. The demand for credit arises due to lack of simultaneity between the realisation of income and act of expenditure; lumpiness of investment in fixed capital formation; and stochastic surges in capital needs and saving that accompany technological innovations (Golait, 2007). Various commercial and nationalised banks are engaged in providing credit to the farmers.

### ***Irrigation***

Irrigation is one of the major inputs which required for the cultivation of crops. It is also capable of increasing cropping intensity by the adoption of bio-chemical technology (or modern farming technology) thereby increases the overall production of the crops.

### ***Agricultural Insurance***

In the context of increasing commercialisation and globalisation, the scope and relevance of agricultural insurance are not widely understood in India. Crop insurance, which is generally restricted to

field crops, is generally considered synonymous with agricultural insurance. However, agricultural insurance covers a wide spectrum of activities like horticulture, plantations, livestock, poultry, aquaculture, sericulture, etc. Further, it extends to the entire production process including post-harvest storage, processing and transportation of produce to the final markets (UNCTAD, 1994). In a country like India, where agricultural production has been subjected to vagaries of weather and large-scale damages due to attack of pests and diseases, agricultural insurance has assumed to play an important role in providing the support to siphon off risk and uncertainty in the crop sector for sustainable growth.

### ***Network of Research and Extension Services***

One of the major research aims of different institutions is to develop high yielding, good quality varieties with tolerance to disease and pests. These agencies includes public sector extension, represented mainly by the State Department of Agriculture (DoA), Non-Governmental Organisations (NGOs), input agencies, mass media, research institutions or farmers associations are engaged in providing information for the majority of farmers.

### **Institutional setup for Black Pepper: Actors and functions**

Black pepper is one of the important spice crops in the country where multiple actors from both central and state government are playing their own role to enhance the performance of black pepper cultivation. Concerted efforts were made by Spices Board under Ministry of Commerce, Indian Institute of Spices Research, Calicut, All India Coordinated Research Project on Spices, National Bureau of Plant genetic Resources, Regional Station, Thrissur, and state agricultural universities like Kerala, Tamil Nadu University of agricultural sciences, Bangalore to conduct research and development activities and providing various extension services for the betterment of this crop.



Black pepper has not been under the purview of spices board till 2007. State government alone had taken decisions regarding this crop in all the aspects related to this crop. Owing to the drastic decline occurred in terms of area and production of the crop, as an agency concerned about the plight of Indian Pepper Industry, the Government of India has introduced number of programmes to increase the production and yield of pepper. Under National Horticulture Mission (NHM), Kerala State had been provided with funds for implementing the following schemes in pepper.

- 1) Production of planting material – Model nursery (public) and small nursery (private & public)
- 2) Replanting / rejuvenation programme in black pepper
- 3) Area expansion in black pepper
- 4) Adoption of Organic farming in pepper
- 5) Implementation of IPM in pepper gardens
- 6) Technology dissemination programmes

In order to supplement the above programmes, the Directorate of Arecanut and Spices Development (DASD) directly implements NHM programmes on production of nucleus planting material, seed processing and infrastructure, technology dissemination through frontline demonstration of organic pepper and national level seminars/workshops through various State Agricultural University centers and ICAR institutes. Regarding the high yielding varieties of black pepper, research Institutes has developed sixteen improved varieties so far<sup>4</sup>.

To strengthen the cultivation of black pepper cultivation in major pepper production districts (Idukki and Wayanad) of the state, National Horticulture Mission (NHM) under Ministry of Agriculture, Government

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4 Details of improved varieties of HYVs of black pepper are clearly given in Cultural Practices, spices board.

of India sanctioned a pepper rejuvenation programme in Idukki District which is being implemented by Spices Board from 2009-10 onwards. Under this programme, Rs 120 crores has been sanctioned to Spices Board as subsidy under NHM to be utilized over a period of five years. It is proposed to rejuvenate 60,000 ha of old and senile pepper gardens in Idukki district within five years. Under this programme, financial assistance is provided for production of planting material by establishing small nurseries, rejuvenation of pepper gardens, construction of vermi-compost units, promotion of IPM, HRD programme and infrastructure development. Similarly in Wayanad, Spices Board started a replanting / rehabilitation programme in pepper with a financial outlay of Rs 48 crores using the funds available from the Ministry of Commerce.

It has been noticed the presence of multiple actors, which are quite active in providing various kinds of support for black pepper. We noted two major findings from the previous analysis: first, variation in acreage allocation of the crop across regions; and second, negative growth experienced in the production of black pepper. In this light, the following section examines how far the institutional arrangements made by the vested agencies reached effectively at the grass root level.

### **Findings from the Field**

As per NSSO definition, farmers can be broadly classified as Marginal ( $\leq 1$  hectare<sup>5</sup>), Small (1 to 2 hectares), Semi Medium (2 to 4 hectares), Medium (4 to 10 hectares) and Large ( $\geq 10$  hectares). Statistics from Krishibhavans in both Idukki and Wayanad districts shows that the majority of the pepper growers are belong to marginal and small categories. Table 7 shows the information on number of pepper growers which are selected for further analysis.

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5 1 Hectare = 2.5 acres. Since the land holdings of farmers is very less, in this situation measurement of land holdings in terms of acres would provide more clear result than hectare. As a result, the present study taken into account of the unit 'acre' instead of 'hectare'.

**Table 7: Classification of black pepper growers according to land holdings**

Category	Idukki	Wayanad	Total
Marginal Farmers	37 (46.2)	64 (64)	101 (56)
Small Farmers	31 (38.8)	32 (32)	63 (35)
Semi Medium Farmers	12 (15)	4 (4)	16 (9)
Total Sample	80	100	180

Source: Sample Survey, 2012.

Note: Figures in parentheses are percentages.

### Household Characteristics

It is evident from the Table 8 that, the average age of the head of the household in both the study areas was around 55 years. It is clear that most of the black pepper growers are having nearly 10 years of schooling in both the districts. Moreover the average land holdings of total 180 growers were around 3.09 acres; of which Idukki district has an average area of land of 3.53 acres which is found to be higher than Wayanad (2.64 acres). Regarding the experience in the cultivation of black pepper, it is on an average of nearly 38 years among the sample growers. The average family size of the growers is approximately 4 members (Table 8).

**Table 8: Household characteristics of the Black Pepper growers in the study area (In Averages)**

Category	Idukki	Wayanad	Total
Age (in years)	53	57	55
Education (Years of Schooling)	10	9	9.5
Land Holding (in acres)	3.53	2.64	3.09
Experience in Black Pepper Cultivation (years)	35	40	37.5
Family Size (in number)	4	4	4

Source: Sample Survey, 2012

## **Socio Economic Characteristics of Sample**

Since it is important to get an understanding of the profile of the sample before proceeding with the analysis, the socioeconomic characteristics of the growers in Idukki and Wayanad are analyzed on the basis of the attributes such as age, religion, caste, marital status, educational status, and choice of occupation. When the age of the 180 sample black pepper growers is considered, most of the growers (57 percent) belong to the age group between 51 and 65 with a minimum age of 32 and maximum of 87 in Idukki and 38 and 85 in Wayanad (Appendix Table 1A). Gender wise classification of the head of the family who is taking decisions regarding farming activity revealed the male domination (94 per cent) with most of them (91 per cent) included were married (Appendix Table 2A and 3A). Regarding the education level, we can see that 48 per cent of the 180 sample growers have educational qualification up to SSLC and 27 percent with an education less than Primary or less (Appendix Table 4A). This might be the reason why 83 per cent of the 180 sample black pepper growers are depending on farming for their livelihood activity. Along with this, 63.9 per cent of the growers are engaged in animal husbandry in ensuring subsistent income and for the making available of cow dung which is the best manure for black pepper (Appendix Table 5A and 6A).

Regarding the experience in the cultivation of black pepper, one could observe from the survey that 74 percent of the growers are having experience in the cultivation more that 25 years and less than 45 years. Moreover, 17.2 percent of the growers have experienced more than 45 years (Appendix Table 7A).

## **Production Conditions**

This section analyzes the cultural practices followed by black pepper growers, yield levels and production conditions in both Idukki and Wayanad.

### **Land Holding Pattern**

The sample black pepper growers (180) have an operated land holdings of 546.3 acres constituting of 264 acres in Wayanad and 283 acres in Idukki. Out of 264 acres in Wayanad, nearly 45 percent each of area holdings belongs to marginal and small growers, whereas semi medium growers hold 11 per cent of the land (Table 9). As compared to Wayanad, share of area under marginal growers in Idukki is less (24 percent of the total sample area). In Idukki, 33 per cent of total land belongs to semi medium growers. Moreover, 43 per cent of land belongs to small growers in the district.

However the average size of holdings among all the categories of growers in both the districts is more or less the same. It should be noted from the Table 9 that the average landholding size of marginal growers is around 1.8 acres, while for small growers the average size is 3.7 acres in Wayanad and 3.4 acres in Idukki. Among semi medium growers, Idukki district has a slight highest value that is 7.8 acres and for Wayanad it is 7.4 acres.

**Table 9 : Land Holding Pattern of the Sample Black Pepper growers**

Size	Wayanad		Idukki		Total Area
	Area holdings (in acres)	Average Holding Size	Area holdings (in acres)	Average Holding size	
Marginal	116.9 (44.45)	1.8	67.7 (24)	1.8	184.6
Small	117.4 (44.52)	3.7	121.5 (43)	3.4	238.9
Semi Medium	29.5 (11.2)	7.4	93.5 (33)	7.8	123
Total	263.7	2.6	282.6	13	546.3

Source: Sample Survey, 2012.

Note: Figures in parentheses are percentages.

The Table 9 gives information on the total land holdings in the study areas and the average size of holdings. Since black pepper is a perennial crop, the estimation of area is on the basis of number of vines per acre.

### Area under Black Pepper

As per National Horticulture Mission guidelines, area under black pepper has been calculated on the basis of number standards per hectare. For mixed crops, 216 standards<sup>6</sup> have been counted as one acre whereas for mono crops, the number of stands per acre is 500.

**Table 10: Distribution of Land According to Number of Black Pepper Standards**

Category	Wayanad		Idukki		
	Standardised*Area	Average Area	Standardised*Area	Average Area	Total
Marginal	88.5 (44)	1.2	145.9 (34)	4	225.2 (37.6)
Small	90.3	2.8	204.6	6	274.3 (45.8)
Semi Medium	24.1	6.1	74.8	6.2	98.9 (16.5)
Total	202.9	2	425.3	6.2	598.4

Source: Sample Survey, 2012.

Note: Area has been estimated by following this method: For mixed crops, we divided total number of stands by 216 and for mono crops, we divided total number of stands by 500.

It has been noted from the Table 10 that area under black pepper in terms of 216 vines per acre for mixed cropping and 500 vines for

6 Standard is the supporting thing – either trees or any artificial support which helps black pepper to grow. Normally two vines will be grown together in one standard.

mono cropping reveals that area under black pepper in Idukki is very high as compared to Wayanad. Total area under black pepper cultivation in Wayanad is only 202 acres, whereas in Idukki it is 425.3 acres. As we observed from Table 9 that total area holdings in Idukki is only 282.6 acres, but when it is converted into a black pepper standard area, it recorded a twofold increase. But in Wayanad, area under black pepper (202.9 acres) is very less as compared with total actual land holdings (263.7 acres). This shows that the intensity of cultivating black pepper in Idukki is more when compared to Wayanad. This might be one of the reasons to increase the area under black pepper in Idukki as compared to Wayanad (Table 10). Moreover, there is the pronounced prominence of mixed cropping (99 per cent) of black pepper along with other perennial crops in Wayanad, while in Idukki we found some evidence of practicing mono cropping system (17.5 per cent of the Idukki sample growers) (Appendix Table 8A). The major crop combination in Wayanad arecanut (91 per cent), coffee (92 per cent), coconut (88 per cent), banana (63 per cent), rubber (68 per cent), paddy (11 per cent), vegetables (2 per cent) and cardamom (5 per cent) (Appendix Table 9A), whereas in choice of cropping pattern by the sample black pepper growers in Idukki is cardamom (36 per cent), arecanut (17 per cent), coffee (31 per cent), coconut (47 per cent), banana (36 per cent), cocoa (16 per cent), rubber (15 per cent), vegetables (18 per cent) and vanilla (8 per cent) (Appendix Table 10A).

### **Age wise distribution of Plants**

It has been noted from Table 11 that the percentage of standards under both pre bearing (less than 4 years) and peak bearing (4 to 20 years) are more or less same for all the categories in Wayanad (Table 11). The percentage of sample growers having over aged stands is negligible. One interesting point here is that within age group, the percentage of sample growers who cultivate local varieties is slightly higher than high yielding varieties developed by state agricultural universities in

their research institutes. A possible exception has seen in peak bearing category of small growers which includes 31 per cent has cultivated HYVs against 28 percent of local varieties.

**Table 11: Distribution of Sample Growers According to Age Structure of Plants in Wayanad**

Category	Pre Bearing*		Peak Bearing**		Over Aged***	
	Local	HYV	Local	HYV	Local	HYV
Marginal	61(61)	58(58)	62(62)	60(60)	0	1(1)
Small	27(27)	30(30)	28(28)	31(31)	2(2)	3(3)
Semi Medium	4(4)	2(2)	3(3)	2(2)	1(1)	0
Nil	8(8)	10(10)	7(7)	7(7)	97(97)	96(96)
Total	100	100	100	100	100	100

Source: Sample Survey, 2012.

Note: Figures in Parentheses are percentages.

\*Less than 3 years,\*\* 4 to 20 years, \*\*\* Above 20 years.

While in Idukki, the situation has entirely changed. Most of the growers in the study area prefer to choose HYV than local varieties. It has to be noted that nearly 23.8 per cent of the marginal growers prefer to cultivate HYVs of black pepper, whereas only 17.5 per cent prefer local varieties. Similarly for other two categories also, the per cent of growers who prefer HYVs against local can be seen from the Table 12. Coming to the peak bearing category, one could observe the similar pattern of more HYVs of black pepper than local varieties. It shows that among marginal growers nearly 35 per cent of the sample growers has HYV pepper standard of the age between 4 to 20 years. Data on the percentage of small growers regarding the choice of local and HYV suggests that out of 80 sample growers, 27.5 per cent of growers prefer each varieties. Among semi medium growers, it can be noted that the percentage of growers who has cultivated local varieties (37.5 per cent) in their farm is high as compared to the percentage of HYVs (28.8



per cent). We can see from the table 5.10 that the percentage of over aged standards (above 20 years) is comparatively less for both the districts. There also one could observe that the percentage of HYVs among pepper standards is slightly higher than local varieties (see Table 12).

**Table 12: Distribution of Sample Growers According to Age Structure of the Black Pepper Standards**

Category	Pre bearing		Peak Bearing		Over Aged	
	Local	HYV	Local	HYV	Local	HYV
Marginal	14 (17.5)	19 (23.8)	20 (25)	28 (35)	4 (5)	7 (8.8)
Small	17 (21.25)	18 (22.5)	22 (27.5)	22 (27.5)	4 (5)	5 (6.3)
Semi Medium	6 (7.5)	7 (8.8)	8 (10)	7 (8.8)	4 (5)	2 (2.5)
Nil	43 (53.8)	36 (45)	30 (37.5)	23 (28.8)	68 (85)	66 (82.5)
Total	80	80	80	80	80	80

Source: Sample Survey, 2012.

Note: Figures in parentheses are percentages.

On the whole it is clear from the sample; in Wayanad most of the sample black pepper growers have preference for local varieties over HYVs, whereas in Idukki most of the growers are cultivating HYVs. As seen from the farm level that, high yielding varieties required strong standards to climb and grow than local varieties. In this context the next section examines the type of standards available in both the districts for black pepper cultivation.

The choice of varieties between local and HYVs depends on the type of supporting standard available for the black pepper to grow. The type of standards required for local and HYVs are different. Normally HYVs requires strong stand than local varieties. The choice of pepper stands in Wayanad is given in Table 13

**Table 13: Distribution of Sample growers According to their standard preference in Wayanad (in percentages)**

Standard	Marginal	Small	Semi Medium
Murukke (Papilionaceae)	12.5	9.38	25
Silver oak (Grevilla robusta)	57.81	75	75
Konna (Cassia fistula Linn)	12.5	6.25	0
Sheema Konna (Cassia fistula Linn)	96.88	87.5	75
Bamboo (Bambuseae)	3.13	21.88	0
Arecanut (Areca catechu)	32.81	40.63	25
Moringa (Moringa oleifera)	93.75	93.75	100
Others	56.25	75	25

Source: Sample Survey, 2012.

It has been noted that 96 per cent of marginal growers, 87.5 per cent of small growers and 75 per cent of semi medium growers are using Cassia fistula Linn as the standard followed by Moringa oleifera, Grevilla robusta and other trees includes Artocarpus heterophyllus (jack), Mangifera indica (mango) so on. As noted from the experience of sample growers that though areca nut can be used as a stand for the cultivation of black pepper, the grip which provided by this crop during rainy season will not enough to stand the vines properly. This might leads to the destruction of pepper vines during heavy monsoon periods. Even also 32.81 per cent of marginal growers, 40.63 per cent of the small growers and 25 per cent of the semi medium growers prefer areca nut for pepper cultivation, because of the unavailability of enough supporting stands in their farm field. However, murukke is one of the important supporting stand for black pepper cultivation, the percentage of growers using murukke for raising black pepper is very low (Table 13). In 2004, all the murukke trees in Wayanad got severely infected by a particular

type of pest- Erythrina Gall Wasp<sup>7</sup>, and most of the murukke got destructed. Before the incidence happened most of the pepper stands where cultivated in murukke. But the problem with the murukke led to the destruction of majority of the black pepper plants which are cultivated in murukke. The re cultivation of murukke again got failure due to pest attack. After this incidence, most of the pepper growers in Wayanad are facing difficulty to get proper supporting stands to cultivate black pepper. Type of stands used by sample pepper growers in Idukki is given in the Table 14.

**Table 14: Distribution of Sample growers According to their standard preference in Idukki (in percentages)**

Stand	Marginal	Small	Semi Medium
Murukke (Papilionaceae)	75.7	83.9	58.3
Silver oak (Grevilla robusta)	16.2	32.3	0.0
Konna (Cassia fistula Linn)	5.4	6.5	0.0
Sheema konna (Cassia fistula Linn)	29.7	6.5	25.0
Others	51.4	51.6	66.7

Source: Sample Survey, 2012.

It may be observed from the Table 14 that murukke is the most preferred stand for black pepper cultivation in Idukki. Out of 80 sample growers, nearly 75.7 per cent of marginal growers, 83.9 per cent of the small growers and 58.3 per cent of the semi medium growers are cultivating black pepper in murukke. Next to this, growers are cultivating black pepper by using Sheema konna and silver oak (Table 14). Moreover other than murukke, silver oak, konna, Sheema konna, growers are cultivating black pepper in jack, mango and variety of other trees.

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7 Erythrina Gall Wasp is a small winged insect of ant-like appearance.

### Average Yield of Black Pepper (Kg/Stand)

**Table 15: Average Yield of black pepper in the study area**

District	2010	2011
Idukki	0.96	0.76
Wayanad	0.40	0.60
Total	0.70	0.66

Source: Sample Survey, 2012.

It has been noted from the Table 15 that average yield of black pepper in Idukki is comparatively high. In 2010, the average yield is 0.96 kg/stand, while for Wayanad it was only 0.76kg/stand. Similar is true for the year 2011.

### Institutional Supports and Services

#### Credit

It is evident from the Table 16 that most of the farmers have availed credit from different sources. The share of farmers who have availed credit is as high as 86 per cent in Wayanad and 72.5 per cent in Idukki. The major source of credit is found to be co-operative and nationalised banks (see Appendix 11 A).

**Table 16: Distribution of Sample Growers based on Credit availed**

Category	Wayanad				Idukki			
	Marginal	Small	Semi Medium	Total	Marginal	Small	Semi Medium	Total
Yes	52 (81.3)	30 (93.8)	4 (100.0)	86.0	25 (67.6)	24 (77.4)	9 (75.0)	58 (72.5)
No	12 (18.8)	2 (6.3)	0.0	14.0	12 (32.4)	7 (22.6)	3 (25.0)	22 (27.5)
Total	64	32	4	100	37	31	12	80

Source: Sample Survey, 2012.

Note: Figures in parentheses are percentages.

## Insurance

During field survey it has been noted that black pepper is one of the spice crops which is prone to different risks in the form of various pests and disease attacks and climatic variations. However, from the field survey it was transpired that as of now there is hardly any institutional arrangement for providing crop insurance for the black pepper growers.

## Replanting and rejuvenation schemes

As we have mentioned earlier, spices board has started the scheme of providing replanting subsidy to the growers. Payment of subsidy is per plant basis which is planted with a minimum of two rooted or stem cuttings. Subsidy per standard replanted/rejuvenated is Rs.28.00 which will be paid in two annual instalments of Rs.16.00 during the year of planting and Rs.12.00 during the subsequent year. This provision is basically for those growers who have stands between 10 and 1080. Moreover, black pepper is one of the side crops; spices board is not providing any more schemes for the welfare of this crop. It is observed from Table 17 that all the categories have replanted less than 500 stands of black pepper within 5 years. In Idukki 50 per cent of the 80 total samples in Idukki are coming under this category.

**Table 17: Distribution of Sample growers according to replantation of standards (in percentages)**

Category	Wayanad				Idukki			
	Marginal	Small	Semi Medium	Total	Marginal	Small	Semi Medium	Total
Less than 500	98.4	96.9	75.0	97.0	59.5	32.3	66.7	50.0
500 to 1000	0.0	3.1	25.0	2.0	0.0	32.3	8.3	13.8
Above 1000	0.0	0.0	0.0	0.0	8.1	6.5	0.0	6.3
Nil	1.6	0.0	0.0	1.0	32.4	29.0	25.0	30.0

Source: Sample Survey, 2012.

### Amount of Subsidy Availed

Subsidies can be availed only for those growers who holds land less than 5 acres. As per this norm, 68 growers in Idukki and 96 growers in Wayanad were eligible for availing subsidies.

**Table 18: Distribution of Sample growers According to Subsidy (in Percentages) for the last five years**

Subsidy	Wayanad			Idukki		
	Marginal	Small	Total	Marginal	Small	Total
Less than 2500	20 (31.3)	10 (31.3)	27 (28.1)	5 (13.5)	0	5 (7.4)
2500-5000	9 (14.1)	9 (28.1)	17 (17.7)	4 (10.8)	5 (16.1)	9 (13.2)
Above 5000	2 (3.1)	6 (18.8)	6 (6.3)	12 (32.4)	12 (38.7)	24 (35.3)
Nil	33 (51.6)	7 (21.9)	40 (41.7)	16 (43.2)	14 (45.1)	30 (44.1)
Total	64	32	96	37	31	68

Source: Sample Survey, 2012.

Note: Figures in parentheses are percentages

It may be observed from the Table 18 that 51.6 per cent of the marginal growers in Wayanad and 43.2 per cent of the marginal growers in Idukki are not availing any subsidy. One of the reasons for this phenomenon is, most of the growers feel that applying for subsidies is a time consuming process and there is no surety that they can avail the subsidy in the setting of heavy pest and disease attack to the standards.

### Establishment of Nursery

Though spices board is providing subsidies for developing black pepper nurseries in their own farm land, none of the sample growers have yet started their own nursery.

**Table 19: Distribution of Samples According to source of information on plant variety**

	Wayanad			Idukki			Total
	Marginal	Small	Semi Medium	Marginal	Small	Semi Medium	
Agricultural Office	0.0	0.0	0.0	1(2.7)	0.0	0.0	1(1.3)
Spice Board/ IICRI	0.0	0.0	0.0	8(21.6)	2(6.5)	4(33.3)	14(17.5)
Private Consultants	1(1.6)	1(3.1)	0.0	0.0	2(6.5)	0.0	2(2.5)
Other Farmers	4(6.3)	2(6.3)	0.0	17(45.9)	18(58.1)	3(25.0)	38(47.5)
Pesticide/ Fertilizer dealers	0.0	0.0	0.0	0.0	1(3.2)	0.0	1(1.3)
Other sources	0.0	0.0	0.0	6(16.2)	3(9.7)	1(8.3)	10(12.5)
All the above	35(54.7)	19(59.4)	3(75.0)	0.0	0.0	0.0	57(57.0)
None	24(37.5)	10(31.3)	1(25.0)	5(13.5)	31(16.1)	4(33.3)	35(35.0)
Total	64	32	4	37	31	12	100

Source: Sample Survey, 2012.

### **Source of Information**

Table 19 revealed that 57 per cent of the sample growers in Wayanad are depending all the below mentioned sources to collect information on plant varieties. Among 100 sample growers in Wayanad, 6 per cent of the growers depended on other fellow farmers. While in Idukki, nearly 21.6 per cent of the marginal growers only depends spices board only for getting information on plant variety. Whereas 47.5 per cent of the 80 sample growers in Idukki depended on the fellow farmers to get information. It is observed that in Idukki, growers mostly depend on spices board and other farmers to obtain information.

When it comes to information regarding plant protection, Table 20 shows that in Wayanad all the sample growers depends all the below mentioned sources to gather information regarding plant protection. In Idukki, majority (30 per cent) of the sample growers depends on pesticides and fertilizer dealers to get information on plant protection.

### **Source of Information on fertiliser use/ price**

Regarding the source of information regarding fertiliser use, sample growers are mainly contacting agricultural office, spices board, other farmers and pesticide and fertilisers dealers, among those, percentage of sample growers who are approaching pesticide/fertiliser dealers is highest in both the districts. The heavy dependence of private dealers for plant protection is indicative of the failure of institutional mechanism and its implications, especially in term of excessive use of chemical fertilizers and pesticides needs further inquiry. For information on prices, sample growers depend mostly on news paper, television and radio.

### **Source of Planting Material**

Regarding the source of planting material, 25 per cent of the sample growers in Wayanad are depending private nurseries to get



**Table 20: Distribution of Samples According to source of information on plant protection (in percentages)**

Source	Wayanad				Idukki				Total
	Marginal	Small	Semi Medium	Total	Marginal	Small	Semi Medium	Total	
Agricultural Office	0.0	0.0	0.0	0.0	2.7	3.2	0.0	2.5	
Spice Board/ICRI	0.0	0.0	0.0	0.0	18.9	9.7	25.0	16.3	
Private Consultants	0.0	0.0	0.0	0.0	0.0	3.2	8.3	2.5	
Other Farmers	0.0	0.0	0.0	0.0	24.3	29.0	16.7	25.0	
Pesticide/Fertilizer dealers	0.0	0.0	0.0	0.0	24.3	35.5	33.3	30.0	
Other sources	0.0	0.0	0.0	0.0	24.3	9.7	8.3	16.3	
Both 1,2,3,5	62.5	78.1	50.0	67.0	0.0	0.0	0.0	0.0	
None	37.5	21.9	50.0	33.0	5.4	9.7	8.3	7.5	

Source: Sample Survey, 2012.

planting material. While 75 per cent are using planting material from their own farm land and also from spices board and private nurseries. In Idukki, 40 per cent of the sample growers are getting planting material from their own field to replant and nearly 42.5 per cent of the growers depends all the sources to get planting materials.

**Table 21: Distribution of Samples According to source of planting material (in percentages)**

Source	Wayanad				Idukki			
	Marginal	Small	Semi Medium	Total	Marginal	Small	Semi Medium	Total
Own Farm	0.0	3.1	0.0	1.0	37.8	45.2	33.3	40.0
Private Nursery	7.8	15.6	25.0	11.0	18.9	9.7	8.3	13.8
Spices Board	0.0	0.0	0.0	0.0	5.4	3.2	0.0	3.8
State Agri dept	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All the above	92.2	81.3	75.0	88.0	37.8	41.9	58.3	42.5

Source: Sample Survey, 2012.

### **Organic farming**

Agricultural practices world over has been undergoing changes over time. In order to ensure food security and self sufficiency, our country is following intensive agricultural practices over the past four decades. This was achieved through development of input responsive varieties coupled with use of chemical fertilizers and plant protection chemicals. Various technologies like Biological agriculture, Biodynamic farming, Health food, Green Food have been in vogue in the area of organic farming. Organic farming hinges on extensive use of naturally available resources, preferably on-farm inputs to enhance soil fertility,

in contrast to chemical fertilizers. The concept of organic farming is not new to Indian farming community. Several forms of organic farming are being successfully practiced in diverse agro-climatic situations, particularly in rain fed, tribal and hill areas of the country. Much of the forest produce of economic importance like medicinal plants by default come under this category.

Though spices board is providing support to undertake organic farming, only 5 per cent of the growers in Idukki are engaged in organic farming, whereas in Wayanad only 18 per cent of growers are engaged in organic farming.

**Table 22: Distribution of sample According to Organic farming adoption (in percentages)**

Category	Wayanad				Idukki			
	Marg-inal	Small	Semi Med-ium	Total	Marg-inal	Small	Semi Med-ium	Total
Yes	14.1	25.0	25.0	18.0	10.8	3.2	8.3	7.5
No	85.9	75.0	75.0	82.0	89.2	96.8	91.7	92.5

Source: Sample Survey, 2012.

Regarding the support for organic farming, 83 per cent of the sample growers in Wayanad and 82.5 per cent of the sample growers in Idukki are not availing any support (Table 23).

**Table 23: Distribution of samples According to Organic farming Support(in percentages)**

Category	Wayanad				Idukki			
	Marg-inal	Small	Semi Med-ium	Total	Marg-inal	Small	Semi Med-ium	Total
Yes	14.1	21.9	25.0	17.0	18.9	19.4	8.3	17.5
No	85.9	78.1	75.0	83.0	81.1	80.6	91.7	82.5

Source: Sample Survey, 2012.

Coming to the source of support, in case of those who have availed any support, in Wayanad, spices board is providing assistance for organic farming while in Idukki state agricultural department is giving more assistance to the growers.

**Table 24: Distribution of samples According to Organic Supporting Source (in percentages)**

Source	Wayanad				Idukki			
	Marginal	Small	Semi Medium	Total	Marginal	Small	Semi Medium	Total
Spices Board	3.1	12.5	25.0	7.0	5.1	0.0	0.0	2.5
Agri dept	4.7	6.3	0.0	5.0	17.9	19.4	8.3	15.0
Nil	92.2	81.3	75.0	88.0	76.9	80.6	91.7	82.5

Source: Sample Survey, 2012.

### Training Programmes

It has been observed from the study area that, nearly 58 per cent of the sample growers in Wayanad had attended the training programmes more than three times within the last five years (Table 25), while in

**Table 25: Distribution of sample growers according to training camp attended for last five years**

Number of Times	Wayanad				Idukki			
	Marginal	Small	Semi Medium	Total	Marginal	Small	Semi Medium	Total
Once	2 (3.1)	1 (3.1)	0	3 (3)	20 (54)	13 (35)	5 (42)	38 (47.5)
Twice	16 (25)	8 (25)	0	24 (24)	3 (8)	5 (13.5)	2 (16)	10 (12.5)
more than 3	37 (58)	19 (59.4)	2 (50)	58 (58)	4 (10.8)	3 (9.7)	0	7 (8.75)
Nil	9 (14)	4 (12.5)	2 (50)	15 (15)	10 (27)	10 (32.3)	5 (42)	25 (31.25)
Total	64	32	4	100	37	31	12	80

Source: Sample Survey, 2012.

Idukki 47.5 percent of sample growers have attended classes once in the reference period. These programmes are organised by various institutions amongst which spices board organised majority of the programmes in Wayanad and state agricultural office in Idukki (see Table 26).

**Table 26: Distribution of sample growers according to institution wise training camp attended for last five years (in percentages)**

Organi- sation	Wayanad				Idukki			
	Marg- inal	Small	Semi Med- ium	Total	Marg- inal	Small	Semi Med- ium	Total
Agri Dept	50.0	56.3	25.0	51.0	57.4	51.2	47.1	53.3
Spices Board	35.9	31.3	25.0	34.0	21.3	24.4	23.5	22.9
Nil	14.1	12.5	50.0	15.0	21.3	24.4	29.4	23.8

Source: Sample Survey, 2012

It is observed from the Table 27 that 47 per cent of those attended responded that classes were good and 36 per cent found it very good. While in Idukki, 26.25 per cent of the sample growers responded that classes were good but majority of the samples (31.25 per cent) were not willing to rate the programme.

**Table 27: Effectiveness of Training programme**

Organisation	Wayanad	Idukki
Nil	15 (15)	25 (31.25)
Average	2 (2)	6 (7.5)
Good	47 (47)	21 (26.25)
Very Good	36 (36)	12 (15)
Excellent	0	16 (20)
Total	100	80

Source: Sample Survey, 2012.

Note: Figures in parentheses are percentages.

### Utilisation of Extension Services

Though most of the sample growers have attended the classes and rated that their classes were good, only 3 per cent of the total sample growers in Wayanad had approached different institutions for solving agriculture related problems. While in Idukki 60 per cent approached different institutions for agriculture related problems.

It has been noted that majority of the sample growers were not willing to rate the services provided by the concerned institutions. Moreover 53 percent of the sample growers in Wayanad responded that extension officers often visit their farm field while in Idukki, 48 per cent responded the same (Table 28)

**Table 28: Extension Officers Visit (in percentages)**

Frequency	Wayanad				Idukki			
	Marginal	Small	Semi Medium	Total	Marginal	Small	Semi Medium	Total
Very Often	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Often	51.6	59.4	25.0	53.0	54.1	41.9	50.0	48.8
Rarely	0.0	9.4	0.0	3.0	13.5	12.9	16.7	13.8
Very Rarely	48.4	31.3	75.0	44.0	32.4	45.2	33.3	37.5

Source: Sample Survey, 2012.

### Problems Associated with the cultivation of Black pepper

Though black pepper is a homestead farming crop which can be grown along with other crops, it is not free from various problems. Due to this, many respondents at farm level who have a general opinion that black pepper is not a profitable cultivation. Various issues associated with the cultivation of black pepper are as follows:

**i) Pests and Diseases<sup>8</sup>**

- a) Pollu beetle (*Longitarsus nigripennis*) is the most destructive pest of black pepper.
- b) The top shoot borer (*Cydia hemidoxa*) is a serious pest in younger plantations in all black pepper areas.
- c) Leaf gall thrips (*Liothrips karnyi*) is more serious at higher altitudes especially in younger vines and also in nurseries in the plains.
- d) Scale insects such as mussel scale (*Lepidosaphes piperis*) and coconut scale (*Aspidiotus destructor*) causes serious damage to black pepper vines at higher altitudes and also to older cuttings in nurseries in the plains.
- e) Minor pests such as Leaf feeding caterpillars, especially *Synegiasp.*, damage leaves and spikes of younger vines
- f) Foot rot disease (quick wilt) caused by *Phytophthora capsiciis* is one of the most destructive of all other diseases which affects all parts of the vines. This disease occurs mainly during the south west monsoon season.
- g) Pollu disease (Anthracnose) caused due to *Colletotrichum gloeosporioides* which affected especially the berries. The disease appears towards the end of the monsoon.
- h) Spike shedding, one of the emerging diseases in Kodagu and Idukki especially for varieties like Panniyur-1.
- i) Stunt disease is caused by viruses such as Cucumber mosaic virus and a Badnavirus. This affects the vines which exhibit shortening of internodes to varying degrees. This declines the yield of the affected vines gradually.

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8 For more details about each pests and diseases, see Black Pepper (Extension Pamplet) (2009) published by Spices Board, GOI.

- j) Phyllody disease caused by phytoplasma which affects the vines leads to malformation of spikes at varying stages. Such spikes show leafy structure rather than floral buds which becomes unproductive within two to three years.
- k) Slow decline (slow wilt) is a disease which affects the mainly the black pepper vines. Some of the symptoms are foliar yellowing, defoliation and die-back which reappear in subsequent seasons after the end of the monsoon and the diseased vines gradually lose their vigour and productivity.

### **ii) Lack of proper standards**

As majority of the respondents from both the districts especially Wayanad rightly pointed the issue of not enough proper standards for the black pepper cultivation, say for instance, a farmer pointed that

...”panniyur is the preferred variety for all the farmers for cultivation which requires strong standards to grow. But then due to the shortage in the availability of suitable standards, it becomes very difficult for farmers like me to go for cultivating this variety”

(Chacko, Wayanad, 4<sup>th</sup>, April, 2012)

Another farmer from Wayanad said that

“Lack of proper standards available for cultivation is one of the reasons to make black pepper cultivation an unprofitable one”

(Joseph, Wayanad, 4<sup>th</sup>, April, 2012)

### **iii) Labour Shortage**

Like other crops, black pepper growers are also facing the problem of acute shortage of labour. One of the farmers from Wayanad mentioned that

“Labour problem becomes a serious issue after the implementation of MGNREGA”

(Rukmini Devi, Wayanad, 5<sup>th</sup> April, 2012)



On the other hand the mandate of MGNREGA has the provision to allow MNREGA labourers to work at private farm land. In order to avail their labour service, farmers need to register in respective Panchayat office. But then, respondents reported that it is very difficult to get their services at proper time, made farmers to face the issue of labour shortage.

#### **iv) Neglect from respective agencies**

Though there is the presence of multiple actors involved for the upliftment of black pepper cultivation, many of the respondents were mentioned some of the issues related to the current institutional structure. A farmer from Wayanad pointed that

“The concerned agencies are not fully aware about the pests and diseases attacks occurred for this crop. Even if we approach them, we are not getting benefitted. Another issue is that there is a time lag in supplying pesticides/fertilisers through krishibhavans. Due to the delay in supply, most of the pesticides become turn to be waste. In the nutshell, they are not providing enough attention to this crop.”

(Joseph, Wayanad, 4<sup>th</sup> April, 2012)

Another farmer pointed that,

“We are not getting any services properly”

(Sunny, Wayanad, 8<sup>th</sup> April, 2012)

It is clearly evident from the field observation and the discussion with concerned agencies that there is lack of coordination among agencies to provide services and support to the black pepper growers.

#### **v) Other issues**

Some of the respondents have pointed the difficulty in getting good vines, climatic change etc created problems in front of black pepper cultivation.

Due to all the problems involved in the black pepper, majority of the farmers claimed that today's condition is not suitable for black pepper cultivation.

### **Summing Up**

To conclude, it came out from the analysis that there was a decline in the performance of black pepper (in terms of area, production and yield at the state level) which has been contributed mainly by the northern region of the state. However, central region has experienced a steady increase in acreage allocation under black pepper since 1990. Another interesting point noted in this section is that production has recorded a negative growth in the recent decade in all the regions. Similarly growth in the yield for southern and central Kerala has experienced a positive growth while northern Kerala recorded a negative growth, though the pace of decline has come down after 1999. This finding called for the exploration of factors behind the divergent performance across regions – central and northern regions. In the context wherein prices of export oriented crops will be exogenously determined in the world market, the influential role of non price factors gains importance towards the performance of those crops across regions.

Based on the primary survey conducted in both Idukki and Wayanad, where black pepper cultivation is concentrated, the study has come up with following findings. Black pepper, a crop highly vulnerable to pests and disease attack, is under the purview of multiple actors under the Spices Board, Ministry of Commerce, Government of India and State Government. However, there is very limited coordination between different agencies involved in the promotion of this crop. The study observes that Wayanad is more prone to risk in terms of pest attack and climatic disorder against Idukki. Moreover, the intensity of cultivation (Number of stands per acre) is very high in the case of Idukki against Wayanad. Moreover, the access to irrigation facilities is comparatively more in Idukki than Wayanad. The extension activities and the other

support given by the departments concerned are found to be more or less same in both the districts. However, on interaction with the farmers in Wayanad, it was transpired that, despite the existence of institutional arrangements, the system turned out to be a passive spectator to the massive destruction of the black pepper in Wayanad in 2004 on account of varied diseases like quick wilt, slow wilt and little leaves along with destruction of the supporting trees (murukku) due to gal wasp disease. It appears that the growers have lost faith the ability of the institutional arrangements to offer timely help for addressing contingencies confronted by them. In a context of the failure of Institutional support at proper time and lack of coordination among agencies concerned lead the growers to diversify their cropping pattern to other commercial crops. Drawing from its findings, the study calls for more intense institutional intervention and highlights the need for better coordination among various agencies to provide the extension services and support at proper time to the pepper growers.

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## APPENDIX

**Table 1A: Age wise classification of growers at Wayanad and Idukki**

Age	Wayanad			Idukki			Total
	Marginal	Small	Semi Medium	Marginal	Small	Semi Medium	
Less than 50	12 (18.8)	8 (25)	2 (50)	11 (30)	17 (55)	6 (50)	56 (31)
51 to 65	40 (62.5)	20 (62.5)	2 (50)	23 (62)	13 (42)	4 (33)	102 (57)
Above 65	12(12.5)	4(12.5)	0	3(8)	1 (3)	2(17)	22(12)
Total	64	32	4	37	31	12	180

Note: Figures in the parentheses are percentages.

Source: Sample Survey, 2012.

**Table 2A: Distribution of the Members of the Households by Category of Land Holdings and Gender**

Gender	Wayanad			Idukki			Total
	Marginal	Small	Semi Medium	Marginal	Small	Semi Medium	
Male	62 (97)	32 (100)	3 (75)	32 (87)	30 (97)	11 (92)	170 (94)
Female	2 (3)	0	1 (25)	5 (14)	1 (3)	1 (8)	10 (6)
Total	64	32	4	37	31	12	180

Source: Sample Survey, 2012.

Note: Figures in the parentheses are percentages.

**Table 3A: Distribution of the Households in the sample by Marital Status**

Marital Status	Wayanad			Idukki			Total
	Marginal	Small	Semi Medium	Marginal	Small	Semi Medium	
Married	56(88)	31(97)	3(75)	34(92)	30(97)	10 (83)	164 (91)
Unmarried	2 (3)	1 (3)	0	0	0	0	3 (2)
Widow	6 (9)	0	1 (25)	3 (8)	1 (3)	2 (17)	13 (7)
Total	64	32	4	37	31	12	180

Source: Sample Survey, 2012.

Note: Figures in the parentheses are percentages.

**Table 4A: Education Wise Distribution of growers in Different farming category**

Category	Wayanad			Idukki			Total
	Marginal	Small	Semi Medium	Marginal	Small	Semi Medium	
1	24 (38)	6 (19)	0	13 (35)	5 (16)	1 (8)	49 (27)
2	30 (47)	16 (50)	2 (50)	15 (41)	15 (48)	9 (75)	87 (48)
3	8 (13)	6 (19)	1 (25)	4 (11)	3 (10)	2 (17)	24 (13)
4	0	2 (6)	0	4 (11)	7 (23)	0	13 (7)
5	1 (6)	2 (6)	1 (25)	1(3)	1 (3)	0	6 (3)
6	1(6)	0	0	0	0	0	1 (1)
Total	64	32	4	37	31	12	180

\*Note: 1= Primary or Less, 2= Upto SSLC, 3= Secondary Passed but have no degree, 4= Degree holders in general, 5= other Professional degree, 6= Illiterate Figures in parentheses are percentages.

Source: Sample Survey, 2012.

**Table 5A: Distribution of Sample Pepper Growers by Primary Occupational Choice**

Category*	Wayanad			Idukki			Total
	Marginal	Small	Semi Medium	Marginal	Small	Semi Medium	
1	51 (80)	28 (88)	2 (50)	30 (81)	29 (94)	11 (92)	149 (83)
2	2 (3)	1 (3)	1 (25)	1 (3)	1 (3)	0	6 (3)
3	0	0	1 (25)	2 (5)	0	0	3 (2)
4	1 (2)	1 (3)	0	1 (3)	0	0	3 (2)
5	5 (8)	2 (6)	0	2 (5)	0	1 (8)	10 (6)
6	2 (3)	0	0	0	0	0	2 (1)
7	2 (3)	0	0	1 (3)	0	0	3 (2)
8	0	0	0	0	0	0	0
9	1 (2)	0	0	0	1 (3)	0	2 (1)
Total	64	32	4	37	31	12	180

Note- 1= Farming, 2= Employed in State/Central Govt., 3= Employed in Semi Govt. Aided School etc, 4= Employed in Private Sector, 5=Self Employed, 6= Unpaid family Work, 7= Agricultural Labour, 8= Animal Husbandry and Poultry farming, 9= Pensioners

Note: Figures in parentheses are percentages.

Source: Sample Survey, 2012.

**Table 6A: Distribution of Sample black peppers growers by Secondary Occupational Choice**

Category*	Wayanad			Idukki			Total
	Marginal	Small	Semi Medium	Marginal	Small	Semi Medium	
1	11 (17.2)	2 (6.3)	1 (25)	3 (8.1)	1 (3.2)	-	4 (10)
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	-	-	-	-	1 (3.2)	-	1 (0.6)
5	-	-	-	-	-	-	3 (1.7)
6	-	-	-	-	-	-	-
7	-	-	-	1 (2.7)	-	1 (8.3)	2 (1.1)
8	37 (57.8)	17 (53.1)	3 (75)	28 (75.7)	22 (71)	8 (66.7)	58 (63.9)
9	-	-	-	-	-	-	-
10	16 (25)	13 (40.6)	-	3 (8.1)	7 (22.6)	2 (16.7)	12 (22.8)
Total	64	32	-	37	31	12	80

Note- 1= Farming, 2= Employed in State/Central Govt., 3= Employed in Semi Govt. Aided School etc, 4= Employed in Private Sector, 5=Self Employed, 6= Unpaid family Work, 7= Agricultural Labour, 8= Animal husbandry and poultry farming, 9= Pensioners, 10= Nil, Figures in parentheses are percentages

Source: Sample Survey, 2012.

**Table 7A: Distribution of sample growers According to Experience of Black Pepper cultivation**

Year	Wayanad			Idukki			Total
	Marginal	Small	Semi Medium	Marginal	Small	Semi Medium	
Less Than 25	8 (12.5)	1 (3.1)	0	2 (5.4)	4 (12.9)	1 (8.3)	16 (8.9)
25 to 45	49 (76.6)	27 (84.4)	4 (100)	24 (64.9)	20 (64.5)	9 (75)	133 (73.9)
Above 45	7 (10.9)	4 (12.5)	0	11 (29.7)	7 (16.1)	2 (16.7)	31 (17.2)
Total	64	32	4	37	31	12	180

Source: Sample Survey, 2012.

Note: Figures in the parentheses are percentages.

**Table 8A: Distribution of Sample growers According to type of Cultivation**

Category	Wayanad			Idukki			Total
	Mono cropping	Mixed cropping	District Total	Mono-cropping	Mixed cropping	District Total	
Marginal	0	64 (100)	64	-	37 (100)	37	101 (56)
Small	1 (3)	31 (97)	32	10(25.8)	23 (74.2)	31	63 (35)
Semi Medium	0	4 (100)	4	4 (33)	8 (67)	12	16 (9)
Total	1	99 (99)	100	14 (17.5)	65 (81.1)	80	180

Source: Sample Survey, 2012.

Note: Figures in parentheses are percentages.

**Table 9A: Cropping Pattern of Sample Black Pepper Growers in Wayanad**

Crops	Marginal	Small	Semi Medium	Total
Pepper	37(37)	31(31)	12(12)	100
Cardamom	4 (80)	1(20)	-	5(5)
Arecanut	57 (62.6)	31 (34.1)	3 (3.3)	91(91)
Coffee	57 (61.9)	31 (33.7)	4 (4.3)	92(92)
Coconut	56 (63.6)	29 (32.9)	3 (3.4)	88(88)
Banana	42 (66.7)	20 (31.7)	1 (1.6)	63(63)
Rubber	37 (54.4)	27 (39.7)	4 (5.9)	68(68)
Vegetables	1 (50)	1 (50)	-	2 (2)
Paddy	7 (63.6)	3 (27.3)	1 (9.1)	11(11)

Source: Sample Survey, 2012.

Note: Figures in parentheses are percentages.



**Table 10A : Cropping Pattern of Sample Black Pepper Growers in Idukki**

Crops	Marginal	Small	Semi Medium	Total
Pepper	37 (46.3)	31 (38.8)	12 (15)	80 (100)
Cardamom	18 (50)	13 (36.1)	5 (13.9)	36 (45)
Arecanut	7 (41.2)	6 (35.3)	1 (5.9)	17 (21.3)
Coffee	11 (35.5)	15 (48.4)	6 (19.4)	31 (38.8)
Coconut	22 (46.8)	20 (42.6)	5 (10.6)	47 (58.8)
Banana	14 (38.9)	18 (50)	4 (11.1)	36 (45)
Rubber	3 (25)	7 (58.3)	2 (16.7)	12 (15)
Vanila	5 (62.5)	3 (37.5)	0	8 (10)
Cocoa	7 (43.8)	7 (43.8)	2 (12.5)	16 (20)
Vegetables	11 (61.1)	5 (27.8)	2 (11.1)	18 (22.5)

Source: Sample Survey, 2012

Note: Figures in parentheses are percentages

**Table 11A: Distribution of Sample Growers According to Source of Credit (in percentages)**

Banks	Wayanad				Idukki			
	Marginal	Small	Semi Medium	Total	Marginal	Small	Semi Medium	Total
Co-op bank	42.2	28.1	0.0	36.0	24.3	41.9	16.7	30.0
Nationalised Banks	12.5	25.0	100.0	20.0	27.0	29.0	33.3	28.8
Both	26.6	37.5	0.0	29.0	5.4	3.2	16.7	6.3
Nil	18.8	9.4	0.0	15.0	43.2	25.8	33.3	35.0

Source: Sample Survey, 2012

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