Emerging Problems in Cardamom Plantation and its Impact on Growth – A Study

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Abstract

Cardamom plantation is highly lucrative and cardamom industry is not devoid of inherent problems. Those problems pose challenges to the cardamom planters in various ways. The analysis of overall index of constraints in cardamom plantation shows that the majority of the small, medium and large size categories of planters constituting 93.9, 95.3 and 96.3 per cent respectively fall in the index range of 50 – 75 per cent. The numbers of cardamom planters who are in the index range of above 50 per cent constitute 95.6 per cent of the total. It implies that almost all the cardamom planters are facing problems. The Impact of Production Problems (IPP) in cardamom was analysed, as a whole, the significantly influencing independent variables are Lack of Financial Assistant, Lack of Spice Board Support and Lack of Marketing Support. The regression co-efficient of the said variables are statistically significant at five percent level. It implies that one percent increase in the said problems would decrease the gross returns of the cardamom cultivation by 0.389, 0.147 and 0.258 respectively from its mean level. The change in perception on IPPs explains the changes in the profit of the overall plantations to the extent of 81.90 percent since its co-efficient of determination is 0.817.

KEYWORDS: Cardamom Plantation, Problems, ANNOVA, Index, Multiple Regression

Introduction

India is well known as a land of spices from time immemorial. During 2600 to 1000 B.C., spices were used during the construction of Great Pyramid in Egypt. Spices and condiments were related to the natural, aromatic plant components or mixture thereof, used for flavouring, seasoning and imparting aroma or flavour to food. The ancient Aryans considered spices as a powerful remedy for various disorders in human beings. Even today most of the spices are used as ingredients in drug preparations by Unani, Homeopathy and Ayurvedic systems of medicines. India is well known as a land of spices from time immemorial. India produces and exports almost all the varieties of spices in sizeable quantities around 5.65 million tonnes valued approximately at three billion US dollars, and holds the important position in the world in the production of spices. Cardamom is planted and cultivated in the Western Ghats of India, namely Tamil Nadu, Kerala and Karnataka, helping in economic growth, employment generation and supplementing nutrition. Cardamom of commerce is the dried ripe fruit (capsules of cardamom plant) often referred as the "Queen of Spices" because of its very pleasant aroma and taste. There is a huge demand for small cardamom in India and the world market as well. The consumption of

cardamom is more in gulf countries for food culture and tradition. The volume of production therefore must also increase by leaps and bounds. During the recent years, many prospective planters have started functioning across the length and breadth of the district and many of them are increasing their area and production.

Review of Literature

G.K. Nair (2009)[1] stated that spices cultivation is not remunerative due to the rise in cost of production, high wages and low yield because of diseases like quick-wilt, root-wilt. Planters have lost their confidence in spice like pepper, cardamom and betel nut cultivation.

Sebastian Buckingham (2004) in his report on Cardamom cultivation observes that cardamom cultivation is effective in poverty alleviation, and that trends indicate that over time almost all households will own Cardamom fields in a setting where there are few or no alternative for earning cash crops. The wide distribution of Cardamom fields raises its importance in terms of whether it continues to have support function for species and habitat within forest areas[2].

Chandrasekar (1986)[3] had found out that the salvation of the Indian cardamom industry lies in bringing down the cost of production and offering the produce at competitive rates. As per his suggestions for getting higher income as well as elasticity for the price structure, the qualitative and quantitative betterment of the produce should be improved.

Statement of the Problem

India from time immemorial had been the home of spices producing almost all varieties of spices of the world. Spices are one of the important group of crops grown in India. One or other forms of spices are grown in different parts of the country. They play an important role in the economy of the country. The quality of these spices produced and exported from the country continues to be one of the best. The hilly areas have comparatively low temperature in winter and moderate temperature in summer, therefore, the spices produced in these areas are comparatively of superior quality. Spices are used entirely as seed, bark, bulb, tuber, leaf, flower and powder etc. Cardamom cultivation is confined to a very limited tract of the tropical world. India is the second largest producer of cardamom in the world but the productivity of cardamom in India is far from satisfactory, while comparing it with the productivity of Guatemala. Indian cardamom is superior in quality, and has always been out-priced by Guatemala where the home consumption is insignificant. Further, though there is a great demand for cardamom the world over, India's performance in the export of cardamom is highly deplorable. An attempt was made to analyse the impact of problems on growth of

[1] G.K. Nair, 2009. Kerala planters switch over to tree fruits. The Business Line, August 9, 2009

[2] Sebastian Buckingham, 'Synthesis Report on Cardamom Cultivation', **Fanna & Flora International, Community-based Conservation in the Hoang Lion Mountains**, April 2004, p.38

[3] Chandrasekar, K.M., "Cardamom", **The Planters Chronicle**, September 1986, p.345

cardamom plantation.

Objectives

The main objectives of this paper are to analyse the problems index based on the score on five variables and to find out the impact of problems on gross return.

Methodology

The micro study was conducted in Idukki District of Kerala, data collected through interview schedule from 337 cardamom planters with 197 small size planters, 86 medium size planters and 54 large size planters out of 350. The study was conducted during March 2016 to May 2017.

Tools for analysis

The tools used for analysis the data are ANNOVA, Multiple Regression and Problem Index

The Problem Index is computed by the formula:

$$\text{Index} = \frac{\sum_{i=1}^{n} \text{Score on Variables}}{\sum_{i=1}^{n} \text{Maximum Score on Variables}} \times 100$$

Where,

$i = 1, \ldots n$ - Number of Variables

Results and Discussions

Though cardamom plantation is highly lucrative, the industry is not devoid of inherent problems. These problems pose challenges to the cardamom planters in various ways.

Identification and elimination of constraints in the cardamom cultivation which cause losses and poses serious problems to the planters will help in strengthening the cardamom production. The researcher has identified five constraints from the study and tabulated them for analysis.

In order to find out the extent and magnitude of problems faced by the respondents, the researcher has measured the attitude of the cardamom planters towards the various constraints with the help of mean score.

The researcher has framed five statements to find the perception of the respondents towards various constraints faced by them which reflect on the various aspects of inputs. The respondents are asked to opine the aforesaid statements on the basis of the quantum of problems they face on a five point scale namely, Strongly Agree

(SA), Agree (A), No Opinion (NO), Disagree (DA), Strongly Disagree (SDA). These scales are assigned scores in the order of 5,4,3,2 and 1 respectively.

The planters with high perception of the statements are assigned high scores and lesser ones with scores in the descending order from 5 points. While the high scores indicate a greater measure of problems due to such constraints, the lesser scores indicate the lesser degree of problems.

In order to find out the significant difference among the three categories of planters with regard to their perception on the aforesaid statements about the different types of constraints, the one way analysis of variance has been performed.

The following problems pose challenges to the cardamom planters in various ways.

LACK OF FINANCIAL ASSISTANCE

Finance is as important in cardamom plantation as in the case of any other business activity. The planters have to invest in the purchase of land and incur expenses in purchase of seedlings, labour work, fertilisers, manures, pesticide and the like. After the gestation period the expenses are recurring in nature especially labour charges. As Finance is considered to be the life blood of any business activity the cardamom plantation requires the same. Lack of fund will hamper the successful functioning of cardamom production. Therefore an attempt was made to analyse the factor 'lack of Financial Assistance' in cardamom plantation with the help of five variables. The cardamom planters are asked to rate these variables at five point scale according to the order of existence from very high to low. The resulted mean score and the respective 'F' statistics are shown in Table 1.

Table 1
ATTITUDE OF CARDAMOM PLANTERS TOWARDS LACK OF FINANCIAL ASSISTANCE

Sl. No.	Variables	Mean Score of Cardamom Planters				F – Statistics
		Small	Medium	Large	Overall	
1	Planters are facing problems in arranging initial capital	4.1472	4.0930	4.1296	4.1306	0.1561 ^{NS}
2	The loan is not available quickly	3.7919	3.7209	4.0370	3.8131	2.1212*
3	Rate of interest on loan from money lender is comparatively higher	3.2183	3.3837	3.5370	3.3116	2.0728*
4	For bank loan, Planters are not able to provide collateral securities	3.9036	3.9186	3.7963	3.8902	0.4567 ^{NS}
5	Lengthy process is followed to get loan	3.6802	3.7558	3.9815	3.7478	1.8513*

Source: Primary Data

Of the five variables pertained to the level and importance of the constraint Lack of Financial Assistance, the large size planters' perceived highly on all the statements defining constraint with the mean scores of 4.1296, 4.0370, 3.5370, 3.7963 and 3.9815 respectively in the order of the statements presented in Table 1. The medium and small planters also perceive significantly of the constraints "The loan is not available quickly", "Rate of interest on loan from money lender is comparatively higher" and "Lengthy process is followed to get loan". There also existed variability among the statements concerning this constraint.

The significant difference among the three categories of planters is identified regarding the perception on the three statements related to Lack of Financial Assistance, since the respective F-statistics is significant at 5 per cent level.

Lack of Financial Assistance Index (LFAI) among the Cardamom Planters

In order to know about the quantum of these constraints stated in Table 1 on the cardamom production, attitude towards Lack of Financial Assistance Index (LFAI) among the planters was worked out for further analysis. The distribution of the planters on the basis of their attitude towards Lack of Financial Assistance Index (LFAI) is summarized in Table 2.

Table 2
LACK OF FINANCIAL ASSISTANCE INDEX

S.No.	Index Range (Percentage)	Size of Cardamom Planters			
		Small	Medium	Large	Total
1.	**Below 25**	1 (0.50)	-	-	1 (0.30)
2.	**25 – 50**	39 (19.80)	19 (22.10)	10 (18.50)	68 (20.20)
3.	**50 – 75**	121 (61.40)	54 (62.80)	35 (64.80)	210 (62.30)
4.	**75 – 100**	36 (18.30)	13 (15.10)	9 (16.70)	58 (17.20)
Total		197 (100.00)	86 (100.00)	54 (100.00)	337 (100.00)

Source: Primary Data

It is inferred from Table 2 that the majority of all the three categories of Planters fall in the index range of 50 to 75 per cent signifying that 'Lack of Financial Assistance' is a major constraint, thereby confirming the fact that almost all the statements of constraint do cause adverse impacts in their cardamom production. The large planters, medium planters and small planters shared the opinion with 64.80 percent, 62.80 percent and 61.40 percent respectively in the index range of 50 – 75 percent.

2. Lack of Disease and Disaster Management

In cardamom plantation, plants are grown in large number according to the area of the plantation. There are various diseases that affect the cardamom plant in the nursery as well as at the plantation stage. Though health care measures are undertaken very carefully in the plantations, plants are infected by the diseases. This will result in a huge loss. Therefore an attempt was made to analyse the factor 'disease and disaster Management' in cardamom plantation with the help of five variables. The cardamom planters are asked

to rate these variables at five point scale according to the order of existence from very high to low. The result of the mean score and the respective 'F' statistics are presented in Table 3.

Table 3
ATTITUDE OF CARDAMOM PLANTERS TOWARDS LACK OF DISEASE AND DISASTER MANAGEMENT

Sl.No.	Description	Mean Score of Cardamom Planters				F – Stat
		Small	Medium	Large	Overall	
1	Low Yield Variety	3.5381	3.5698	3.7778	3.5846	1.0947
2	Wild Animal Attack	3.7360	3.8372	3.9259	3.7923	1.0441
3	Diseases	3.8477	4.0233	4.1296	3.9377	2.4143
4	Poor Management	3.7970	3.6512	3.8148	3.7626	0.6206 ^{NS}
5	Natural Disaster	3.7462	3.4302	3.4815	3.6231	3.1450

Source: Primary Data

Of the five variables pertained to the level and importance of constraints, the large planters perceived highly of all the statements defining the constraint except 'natural disaster' with mean scores of 3.7778, 3.9259, 4.1296 and 3.8148 respectively in the order of the statements presented in Table 3. The small and medium planters also perceived highly of the two constraints "wild animal attack" and "diseases". The constraint 'Natural Disaster' has less impact on cardamom plantation under medium and large plantation since it is a rare phenomenon. Hence the variability in the attitudes could be observed among the three categories of planters.

The significant difference among the three categories of planters is identified regarding the perception on the four statements related to the Lack of Disease and Disaster Management, since the respective F-statistics is significant at 5 per cent level.

Lack of Disease and Disaster Management Index (LDDMI) among the Cardamom Planters

In order to know about the quantum of these constraints stated in Table 3 on the cardamom production, attitude towards Lack of Disease and Disaster Management Index (LDDMI) among the planters was worked out for further analysis. The distribution of the planters on the basis of their attitude towards LDDMI is summarized in Table 4.

Table 4
Lack of Disease and Disaster Management Index

S.No.	Index Range (Percentage)	Size of Cardamom Planters			
		Small	Medium	Large	Total
1.	**25 – 50**	40 (20.30)	17 (19.80)	15 (27.80)	72 (21.40)
2.	**50 – 75**	131 (66.50)	53 (61.60)	33 (61.10)	217 (64.40)
3.	**75 – 100**	26 (13.20)	16 (18.60)	6 (11.10)	48 (14.20)
Total		197 (100.00)	86 (100.00)	54 (100.00)	337 (100.00)

Source: Primary Data

It could be inferred from Table 6.4 that the majority of all the three categories of Planters fall in the index range of 50 to 75 per cent signifying that 'Lack of Disease and Disaster Management' is a major constraint constituting 64.40 percent of the total, thereby confirming the fact that almost all the statements of constraint do cause adverse impacts in their cardamom production. The large planter with 61.10 percent, medium planters with 61.60 percent and small planters with 66.50 percent fall in the index range of 50 – 75 percent and also share the same opinion.

Lack of Spice Board Support

The Spices Board is the Indian government regulatory and export promotion agency for Indian spices. The board is headquartered in Kochi. Mr.Subash Vasu is the current chairman of Spices Board. The spices are cumin, pepper, fenugreek, cardamom, ginger, turmeric, fennel bulbs, cinnamom and the like. Spices board supports planters to enhance the productivity and planters livelihood. The board is a supportive agency for cardamom promotion in India. Therefore an attempt was made to analyse the factor 'Lack of Spices Board Support' in cardamom plantation with the help of five variables. The cardamom planters are asked to rate these variables at five point scale according to the order of existence from very high to low. The result of the mean score and the respective 'F' statistics are presented in Table 5.

Table 5
ATTITUDE OF CARDAMOM PLANTERS TOWARDS LACK OF SPICES BOARD SUPPORT

Sl.No.	Description	Mean Score of Cardamom Planters				F – Stat
		Small	Medium	Large	Overall	
1	Training on Plantation	3.7817	4.0930	3.9259	3.8843	3.7607 *
2	New Variety of Plant	3.5076	3.6395	3.7593	3.5816	1.3903 *
3	Commission on Auction	3.5381	3.5000	3.6481	3.5460	0.3714 ^{NS}
4	Advances on Cardamom	3.7868	3.9186	3.9630	3.8487	1.6068 *
5	Delayed Payment	3.4619	3.4884	3.6481	3.4985	0.7911 ^{NS}

Source: Primary Data

It could be understood from Table 5 that of the five variables pertained to the level and importance of constraints, all size planters have high perception on the two variables 'training on plantation' and 'Advances on Cardamom' significant. The variable 'New variety of plant' was also significant at five per cent level in small, medium and large planter with 3.5076, 3.6395 and 3.7593 respectively. With the support of bio-laboratory the spices board may introduce new varieties that are suitable to the level of soil and climatic conditions for more productivity. Thus the attitudes with variability could be observed among the three categories of planters.

The significant difference among the three categories of planters is identified regarding the perception on the four statements related to the Lack of Spices Board Support, since the respective F-statistics is significant at 5 per cent level.

Lack of Spices Board Support Index (LSBSI) among cardamom planters

The Spices Board provides various support services to the spice cultivators. The cardamom planters are also provided with valuable services. The cardamom planters are effect to some extent when they do not get any services from the board. In order to know about the quantum of these constraints stated in Table 5 on the cardamom production, attitude towards Lack of Spice Board Support Index (LSBSI) among cardamom planters was worked out for further analysis. The distribution of the planters on the basis of their attitude towards LSBSI is summarized in Table 6.

Table 6
LACK OF SPICES BOARD SUPPORT INDEX

S.No.	Description	Size of Cardamom Planters			
		Small	Medium	Large	Total
1.	**Below 25**	1 (0.5)	-	-	1 (0.3)
2.	**25 – 50**	34 (17.3)	21 (24.4)	13 (24.1)	68 (20.2)
3.	**50 – 75**	131 (66.5)	50 (58.1)	33 (61.1)	214 (63.5)
4.	**75 – 100**	31 (15.7)	15 (17.4)	8 (14.8)	54 (16.0)
Total		197 (100.0)	86 (100.0)	54 (100.0)	337 (100.0)

Source: Primary Data

It could be inferred from Table 6 that the majority of all the three categories of Planters fall in the index range of 50 to 75 per cent signifying that 'Lack of Spices Board Support Index is a major constraint constituting 63.50 percent, thereby confirming the fact that almost all the statements of constraint do cause adverse impacts in their cardamom production. The large planter with 61.10 percent, medium planters with 58.1 percent and small planters with 66.50 percent fall in the index range of 50 – 75 percent and also share the same opinion.

LACK OF MARKET SUPPORT

The market is a juncture to get any produce sold. The market plays a vital role in the disbursement of goods and services, satisfaction of consumer needs, the economic development and the like. The cardamom is agricultural produce which requires market information, price details, demand, and nature of traders or buyers to reach the end consumer. The cardamom is to be sold out at reasonable price to continue to be cultivate. If there is any lack of information it will have adverse and serious effects on the cardamom. Therefore, this constitutes a major constraint for the cardamom planters. The result of mean score and the respective 'F' statistics are presented in Table 7.

Table 7
ATTITUDE TOWARDS LACK OF MARKET SUPPORT

S.No.	Description	Mean Score of Cardamom Planters				F – Stat
		Small	Medium	Large	Overall	
1	Price Fluctuation	3.4112	3.4186	3.6296	3.4481	0.6935 ^{NS}
2	Middlemen	3.5787	3.6163	3.8704	3.6350	1.1144 *

3	Stocking Cost	3.4721	3.5465	3.6667	3.5223	0.9685 ^{NS}
4	Process Loss	3.7310	3.6860	3.5926	3.6973	0.3590 ^{NS}
5	Cardamom at Free of Cost	3.2944	3.4884	3.6296	3.3976	3.4444 *

Source: Primary Data

Of the five variables pertained to the constraints faced by the cardamom planters the large planters have significant perception on the factor 'middlemen' and cardamom at free of cost' since the mean scores are 3.6350 and 3.3976 respectively which implies that many traders and sellers are involved which cost more as commission and margin. The quantity of cardamom was taken as sample at free of cost by the auction center and trader as well. The small and medium planters also have high mean score in the variable 'middlemen' 3.5787 and 3.6163 respectively. The small and medium planters have low perceptions on variables 1, 3 and 4. This indicates that cardamom plantations run with moderate market support.

The significant difference among the three categories of planters is identified regarding the perception on the four statements related to the Lack of Market Support, since the respective F-statistics is significant at 5 per cent level.

Lack of Market Support Index (LMSI) among cardamom planters

In order to know about the quantum of these constraints stated in Table 7 on the cardamom production, attitude towards Lack of Market Support Index (LMSI) among cardamom planters was worked out for further analysis. The distribution of the planters on the basis of their attitude towards LMSI is summarized in Table 8.

Table 8
LACK OF MARKET SUPPORT INDEX

S.No.	Description	Size of Cardamom Planters			
		Small	**Medium**	**Large**	**Total**
1.	**Below 25**	1 (0.5)	-	-	1 (0.3)
2.	**25 – 50**	39 (19.8)	24 (27.9)	9 (16.7)	72 (21.4)
3.	**50 – 75**	127 (64.5)	50 (58.1)	41 (75.9)	218 (64.7)
4.	**75 – 100**	30 (15.2)	12 (14.0)	4 (7.4)	46 (13.6)
Total		197 (100.0)	86 (100.0)	54 (100.0)	337 (100.0)

Source: Primary Data

It could be inferred from Table 6.6 that the majority of all the three categories of Planters fall in the index range of 50 to 75 per cent signifying that 'Lack of Market Support Index' is a major constraint constituting 64.7 percent, thereby confirming the fact that almost all the statements of constraint do cause adverse impacts in their cardamom production. The large planter with 75.9 percent, medium planters with 58.1 percent and small planters with 64.50 percent fall in the index range of 50 – 75 percent and also share the same opinion.

ESSENTIAL PROBLEM

For cardamom plantation there are pre-requisites for cultivation namely conducive climate condition, fertile and suitable soil, regular rainfall, labour support and the like. They have a vital role in the growth and production of cardamom. Lacking in any of them will affect the production and causes economic development. The planters have no control over climate, fertility of soil, seasonal rainfall since it is a natural phenomenon. It takes three years to yield its fruit. The gestation period holds more investment without any return. Hence an attempt was made to analyse the factor 'Essential Problem' in cardamom plantation with the help of five variables. The cardamom planters were asked to rate these variables at five point scale according to the order of existence from very high to low. The resulted mean score and the respective 'F' statistics are presented in Table 9.

Table 9

ATTITUDE OF THE CARDOM PLANTERS TOWARDS ESSENTIAL PROBLEM

S.No.	Description	Mean Score of Cardamom Planters				F – Stat
		Small	Medium	Large	Overall	
1	Infertile Soil	2.949	3.023	2.796	2.944	0.4373 ^{NS}
2	Irregular Rainfall	3.244	2.942	3.130	3.148	1.2858 *
3	Long Gestation Period	2.934	3.012	3.185	2.994	0.6603 ^{NS}
4	Lack of Labour	2.929	2.953	2.796	2.914	0.2324 ^{NS}
5	Varying Weather	2.944	3.244	3.019	3.033	1.4112 *

Source: Primary Data

Of the five variables pertained to the level and importance of constraints, the large planters perceived highly of all statements defining the constraint except 'fertile soil' and 'lack of labour' with mean scores of 3.130, 3.185 and 3.019 respectively in the order of the statements presented in Table 6.9. The medium planters perceived highly of the two constraints 'irregular rainfall' and 'varying weather'. Perhaps the large planters are the main sufferers due to the constraints mentioned in the above two statements. Thus variability in the attitudes could be observed among the three categories of planters.

The significant difference among the three categories of planters is identified regarding the perception on the two statements related to the Essential Problem, since the respective F-statistics is significant at 5 per cent level.

Essential Problem Index (EPI) among the cardamom planters

In order to know about the quantum of these constraints stated in Table 9 on the cardamom production, attitude towards Essential Problem Index (EPI) among cardamom planters was worked out for further analysis. The distribution of the planters on the basis of their attitude towards EPI is summarized in Table 10.

Table 10
ESSENTIAL PROBLEM INDEX

S.No.	Index (Percentage)	Size of Cardamom Planters			
		Small	Medium	Large	Total
1	**25 – 50**	46 (23.4)	19 (22.1)	10 (18.5)	75 (22.3)
2	**50 – 75**	124 (62.9)	55 (64.0)	42 (77.8)	221 (65.6)
3	**75 – 100**	27 (13.7)	12 (14.0)	2 (3.7)	41 (12.2)
Total		197 (100.0)	86 (100.0)	54 (100.0)	337 (100.0)

Source: Primary Data

It is inferred from Table 10 that the majority of all the three categories of planters fall in the index range of 50 – 75 per cent signifying that 'Essential Problem' is a major constraint, thereby confirming the fact that almost all the statements of constraint do cause adverse impacts in their cardamom production. The large planter with 77.80 percent, medium planters with 64.0 percent and small planters with 62.90 percent fall in the index range of 50 – 75 percent and also share the same opinion.

6.6 OVERALL CONSTRAINTS INDEX

The Overall Constraints Index (OCI) is computed by the formula:

$$OCI = \frac{\sum_{i=1}^{n} S\,O\,C\,V_i}{\sum_{i=1}^{n} M\,S\,O\,C\,V_i} \times 100$$

Where,

OCI	-	Overall Constraint Index
SOCV	-	Score on Overall Constraint Variables
MSOCV	-	Maximum Score on Overall Constraint Variables
i = 1, … n	-	Number of (Overall Constraint) Variables

The distribution of the planters on the basis of their attitude towards EPI is summarized in Table 11.

Table 11
Overall Constraints Index

S.No,	Description	Size of Cardamom Planters			
		Small	Medium	Large	Total
1.	**25 – 50**	10 (5.1)	3 (3.5)	2 (3.7)	15 (4.5)
2.	**50 – 75**	185 (93.9)	82 (95.3)	52 (96.3)	319 (94.7)
3.	**75 – 100**	2 (1.0)	1 (1.2)	-	3 (0.9)
Total		197 (100.0)	86 (100.0)	54 (100.0)	337 (100.0)

Source: Primary Data

The analysis of the overall index of the constraints in the cardamom plantation in Idukki District clusters shows that the majority of the small, medium and large size categories of planters constituting 93.9, 95.3 and 96.3 per cent respectively fall in the index range of 50 – 75 per cent. The numbers of cardamom planters who are in the index range of above 50 per cent constitute 95.6 per cent of the total. It implies that almost all the cardamom planters are facing problems. Large size planters have faced majority of constraints while the others are quite moderate in this regard.

IMPACT OF PROBLEMS ON PROFIT IN CARDAMOM PLANTATION

The Impact of important Production Problem in the cardamom plantation may have its own influence on the profit of the plantations. It is highly imperative to analyse the impact of IPPs on the profit of the plantations. The multiple regression analysis has been executed to analyse such impact in cardamom plantation in small, medium and large sizes separately. The annual average gross return of the cardamom planter is treated as dependent variable whereas production problems such as Lack of Financial Assistance, Lack of Disease and Disaster Management, Lack of Spices Board Support, lack of Market Support, Essential problem and problems related to growing charge are taken as independent variables. The fitted regression model is

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + eu$$

Where,

Y	-	Gross Return of the Cardamom Plantation (in rupees)
x_1	-	Score on Lack of Financial Assistance
x_2	-	Score on Lack of Disease and Disaster Management
x_3	-	Score on Lack of Spices Board Support
x_4	-	Score on Lack of lack of Market Support
x_5	-	Score on Essential problem
$b_1, b_2, ..., b_5$	-	Regression coefficient of independent variables
a	-	Intercept and
eu	-	Error term

The result of regression analysis is presented in Table 12.

Table 12
IMPACT OF PROBLEMS ON PROFIT IN CARDAMOM PLANTATION

S.No.	Independent Variable	Small	Medium	Large	Overall
1	Lack of Financial Assistance	0.168*	0.246*	0.162*	0.139^{NS}
2	Lack of Disease and Disaster Management	0.010^{NS}	0.002^{NS}	0.105^{NS}	0.389*
3	Lack of Spice Board Support	0.186*	0.195*	0.299*	0.147*
4	Lack of Marketing Support	0.467*	0.171*	0.540*	0.258*
5	Essential Problem	0.222*	0.492*	0.086*	0.281^{NS}
	Constant	11.329	11.275	7.761	3.173

	R^2	0.883	0.678	0.882	0.819
	F-statistics	495.414	21.741	190.785	18.759

'* Significant at five per cent level

The regression analysis for small plantations reveals the R^2 value of 0.883. This implies that 88.30 per cent of variation in the gross returns of the cardamom plantation has been explained by all the five independent variables included in the regression model. The F-value is significant at one percent level indicating that the model is fit for analytical interpretation.

The significantly influencing Important Production Problems on the gross returns of the cardamom plantations in small cardamom plantation is Lack of Financial Assistant, Lack of Spice Board Support, Lack of Marketing Support and Essential Problem, since their respective regression coefficient are significant at five per cent level. One percent increase in the perception on the above said IPPs results in a decline in profit by 0.168, 0.186, 0.467 and 0.222 percent respectively from its mean level.

In case of medium size cardamom plantations, the analysis has pointed out that regression co-efficient of Lack of Financial Assistant, Lack of Spice Board Support, Lack of Marketing Support and Essential Problem have been statistically significant. This implies that one percent increase in the above said production problems results in decrease in gross returns of the planter by 0.246, 0.195, 0.171 and 0.492 from the mean level. The change in perception on IPPs explains the changes in the gross returns of the medium size plantations to the extent of 67.80 percent since its R^2 is 0.678.

Among the large planters, the significantly influencing independent variables are Lack of Financial Assistant, Lack of Spice Board Support, Lack of Marketing Support and Essential Problem. One percent increase in the above variables will result in decrease in gross return among large planters by 162, 0.299, 0.540 and 0.086 respectively from its mean level. The change in perception on IPPs explains the changes in profit of the large size plantations to the extent of 88.20 percent since its co-efficient of determination is 0.882.

In case of cardamom plantation in the study area as a whole, the significantly influencing independent variables are Lack of Financial Assistant, Lack of Spice Board Support and Lack of Marketing Support. The regression co-efficient of the said variables are statistically significant. It implies that one percent increase in the said problems would decrease the gross returns of the cardamom cultivation by 0.389, 0.147 and 0.258 respectively from its mean level. The change in perception on IPPs explains the changes in the profit of the overall plantations to the extent of 81.90 percent since its co-efficient of determination is 0.817.

Conclusion

Cardamom industry is booming now in terms of employment and revenue. It has inherited problems which affect the growth of the plantation in this analysis it is found that the significantly influencing independent variables are Lack of Financial Assistant,

Lack of Spice Board Support and Lack of Marketing Support. The regression co-efficient of the said variables are statistically significant. It implies that one percent increase in the said problems would decrease the gross returns of the cardamom cultivation by 0.389, 0.147 and 0.258 respectively from its mean level. Cardamom industry has more potential to exploit the export oppourtunity in the world market.

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