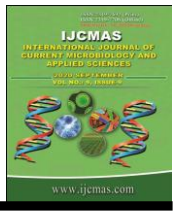
Int.J.Curr.Microbiol.App.Sci (2020) *9*(9): 174-178

International Journal of Current Microbiology and Applied Sciences
***ISSN: 2319-7706* Volume 9 Number 9 (2020)**
Journal homepage: http://www.ijcmas.com



Original Research Article https://doi.org/10.20546/ijcmas.2020.909.021

Constraints Faced by the Respondents in Adopting Inter-Cropping Practices of Black Pepper and Betel Vine in Arecanut Plantation in Jirang Block of Ri-Bhoi District, Meghalaya, India

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A B S T R A C T

Constraints are something that imposes a limit or restriction or that prevents something from occurring. These constraints affect the farming practices of the farmers in Jirang block and lower down their income level in many sphere. Therefore, the purposed of this research was to find out the constraints faced by the respondents in adopting inter-cropping practices of black pepper and betel vine in areca-nut plantation in Jirang block of Ri-Bhoi district, Meghalaya. Jirang Block which is in Ri-Bhoi district of Meghalaya was selected purposively keeping into the fact that less research has been conducted in the recent past and due to the maximum number of the farmers are cultivating areca nut and those of which practice inter-cropping within this block. Since time immemorial, areca nut has been grown in Meghalaya as an important commercial crop. Inter-cropping of crops like black pepper and betel vine has also been started by the farmers for many years as a source of income generation but the management practices was not up to the mark due to many constraints in their farming practices. The research design that was used for this study was an ex-post facto research design. The sample study was selected through multistage sampling method in the selected study area of the respondents. Number of respondents was selected using a simple random method by using computer aided random selection based on the criteria of farmers who were practicing areca nut plantation plus inter-cropping. A survey of 310 adopters was done by collecting the primary data using an interview schedule. Ranking method system was used as a statistical measurement for interpretation of the data and results. Independent variables included in this study were gender, age, marital status, educational level, and type of house, family size, family type, social category, and annual income, information seeking behaviour, participation in extension activities, social participation, innovativeness, scientific orientation, economic motivation and risk orientation which were used to analysed the socio-economic characteristics of the respondents.

Keywords

Areca nut, Black pepper, Betel vine, constraints, Inter-cropping, Ri-Bhoi

Article Info

Accepted:
04 August 2020
Available Online:
10 September 2020

Introduction

Areca nut is the major source of livelihood for small and marginal farmers in Ri-Bhoi District of Meghalaya. Most of the farmers depend on the income from areca nut due to its ability to thrive well in this area. Multiple cropping has been practiced for centuries by

small-scale farmers to reduce the risk of crop failure, attain higher yields, and to improve soil fertility (Litsinger and Moody, 1976).

The main objectives of this study to find out the constraints faced by the respondents in adopting inter-cropping practices of black pepper and betel vine in areca-nut plantation in Jirang block of Ri-Bhoi district, Meghalaya".

Review of literatures

Hong *et al.,* (2019) found out that the share of land under intercropping in the optimal land use is shrinking with the growing scarcity of water, with a declining maize price, and with increasing off-farm employment in combination with higher labor wages. Dai *et al.,* (2017) concluded that there was a significant decline in crop yields, increased demand for scarce water resources, increased demand for labor due to the labor-intensive nature of intercropping, and insecure land tenure. Haneef *et al.,* (2019) concluded that majority of the respondents (89.00 percent) expressed initial low price for the organic produce which is of the same case that happens for inter-cropping of black pepper and betel vine.

Materials and Methods

The present study was conducted in purposively selected district Ri-Bhoi of Meghalaya where practicing of areca nut plantation prevails in large numbers. Further, out of the three blocks in Ri-Bhoi district, Jirang block was selected purposively thereafter 12 villages and 310 respondents was selected through simple random sampling. An Ex-Post facto research design was used for this study. With the help of an ex-post facto research, the researcher tries to analyse the cause and effect phenomena of an event, action or behaviour or controlled and uncontrolled group which is appropriate for studying the constraints in inter-cropping among the areca nut growers in Ri-Bhoi district, since this event had already occurred.

The independent variables selected for this study were age, gender, marital status, educational status, type of house, family size, family type, social categories, occupation ,size of land holdings, annual income, information seeking behaviour, participation in extension activities, social participation, innovativeness, economic motivation, scientific orientation and risk orientation. The data was gathered using pre-tested and semi-structured interview schedule. Collected data were analysed with the suitable statistical tools and the results was therefore interpreted subsequently.

Results and Discussion

Over-all socio-economic characteristics level of the adopters and the non-adopters

From table 1, it is revealed that the majority of the adopters accounted for 47.42 per cent are having high socio-economic characteristics, followed by 40.33 per cent of medium level and 12.25 per cent that of low level characteristics.

he findings were also corroborated those of Jaganathan and Nagaraja (2015) and Kumaran *et al.,* (2018).

The table 2 shows the following results:

Input constraints

The input constraints faced by the adopters in inter-cropping practices depicted from the table 2 based on the ranking from the major to the minor includes the non availability of inputs supplier (I^{st} Rank), non-availability of good quality inputs (II^{nd} Rank), non-availability of good planting materials (III^{rd}

Rank), unavailability of labour (IVth Rank) and the shortage of water (Vth Rank).

Technological constraints

The technological constraints faced by the adopters in inter-cropping practices depicted from the table 2 based on the ranking from the major to the minor includes the lack of government support for inter-cropping system (Ist Rank), lack of knowledge about pest and disease (IInd Rank), lack of training infrastructure (IIIrd Rank), lack of knowledge on inter-cropping system (IVth Rank) and lack of resistant varieties against pest and diseases (Vth Rank).

Economic constraints

The economic constraints faced by the adopters in inter-cropping practices depicted from the table 2 based on the ranking from the major to the minor includes the non availability of subsidies(Ist Rank), unavailability of regular market(IInd Rank), they did not get minimum price as compare top areca nut (IIIrd Rank), exploitation by middle man (IVth Rank), price fluctuation of farm produce (Vth Rank), low yield of the inter-crops (VIth Rank) and increased cost of cultivation (VIIth Rank)

Biophysical constraints

The biophysical constraints faced by the adopters in inter-cropping practices depicted from the table 2 based on the ranking from the major to the minor includes the non-availability of space for planting (Ist Rank), poor quality of the soil (IInd Rank), incidence of pests and diseases (IIIrd Rank), due to high slope of the land (IVth Rank) and sometimes the attack by domestic animals at the younger stage of the crops (Vth Rank).

Psychological constraints

The psychological constraints faced by the adopters in inter-cropping practices depicted from the table 2 based on the ranking from the major to the minor are the difficulty for intercultural operations/harvesting(Ist Rank), reduction in yield of main crop by component crops(IInd Rank) and due to time consuming(IIIrd Rank).

In input constraints the farmers faced a major restriction in inter-cropping due to the unavailability of supplier within the locality. The lack of infrastructure and support by the government make the farmers more difficult for the success of their crop production because the farmers are mostly having a medium level income to poor level of income.

Table.1 Over-all socio-economic characteristics level of the respondents

Sr. No.	Category	Adopters		Non-Adopters	
		Frequency	Percentage	Frequency	Percentage
1.	Low (18 to 45 Score)	38	12.25	93	30.00
2.	Medium (46 to 73 Score)	125	40.33	152	49.04
3.	High (74 to 103 Score)	147	47.42	65	20.96
Total		**310**	**100.00**	**310**	**100.00**

Table.2 Constraints faced by the respondents in adopting inter-cropping in areca-nut

Sr.No	Constraints	Agreed Farmers	Neutral Farmers	Disagreed Farmers	Rank
A	**Input constraint**				
	Non-availability of good quality inputs	150 (48.38%)	140 (45.16%)	20 (6.45%)	II
	Unavailability of labour	90 (29.03%)	200 (64.51%)	20 (6.45%)	IV
	Non-availability of good planting materials	110 (35.48%)	150 (48.38%)	50 (16.12%)	III
	Shortage of water	80 (25.80%)	210 (67.74%)	20 (6.45%)	V
	Non availability of inputs supplier	250 (80.64%)	50 (16.12%)	10 (3.22%)	I
B	**Technological constraints**				
	Lack of knowledge on inter-cropping system	200 (64.52%)	100 (32.26%)	10 (3.22%)	IV
	Lack of training infrastructure	250 (80.65%)	50 (16.13%)	10 (3.22%)	III
	Lack of knowledge about pest and disease	270 (87.10%)	20 (6.45%)	20 (6.45%)	II
	Lack of government support for inter-cropping system	300 (96.78%)	5 (1.61%)	5 (1.61%)	I
	Lack of resistant varieties against pest and diseases	190 (48.39%)	80 (25.81%)	40 (12.90%)	V
C	**Economic constraints**				
	Price fluctuation of farm produce	150 (48.38%)	110 (35.49%)	50 (16.13%)	V
	Non availability of subsidies	300 (96.78%)	5 (1.61%)	5 (1.61%)	I
	Increased cost of cultivation	5 (1.61%)	5 (1.61%)	300 (96.77%)	VII
	Low yield	10 (3.22%)	80 (25.80%)	220 (70.96%)	VI
	Exploitation by middle man	240 (77.42%)	60 (19.36%)	10 (3.22%)	IV
	Did not get minimum price as compare top areca nut	250 (80.65%)	50 (16.13%)	10 (3.22%)	III
	Unavailability of regular market	290 (93.56%)	10 (3.22%)	10 (3.22%)	II
D	**Biophysical constraints**				
	Incidence of Pests and diseases	100 (32.26%)	200 (64.52%)	10 (3.22%)	III
	Non availability space for planting intercrops	200 (64.52%)	50 (16.13%)	60 (19.35%)	I
	Attack by domestic animals	50 (16.13%)	220 (70.97%)	40 (12.90%)	V
	Poor quality of soil	150 (48.38%)	120 (38.71%)	40 (12.91%)	II
	Due to high slope of the land	90 (29.03%)	210 (67.75%)	10 (3.22%)	IV
E	**Psychological constraints**				
	Difficult for intercultural operations/harvesting	50 (16.13%)	70 (22.58%)	190 (61.29%)	I
	Time consuming	10 (3.22%)	30 (9.68%)	270 (87.10%)	III
	Reduction in yield of main crop by component crops	10 (3.22%)	120 (38.71%)	180 (58.07%)	II

The unavailability of space for plantation of crops is another major constraint faced by the farmers. The last but not the least, the major constraint face by the farmers is the difficulty for inter-culture operations and harvesting of the intercrops due to the lack of knowledge of the proper agriculture techniques. These results and findings are having similarities with the findings of Karmawati *et al.,* (2019), Hong *et al.,* (2019) and Bui *et al.,* (2013).

It is therefore concluded that the socio-economic characteristics of the adopters of inter-cropping were mostly of high level. The major constraints were the unavailability of supplier within the locality, lack of Government support, lack of subsidies, non availability of space and difficulty for intercultural operations/harvesting. If all these constraints are taking into proper considerations the farmers socio-economic status will increase tremendously. The government needs to provides proper training and carried out proper extension activities to help the farmers in developing their knowledge and skills and in persuading the non-adopters to practice the inter-cropping practices as a source of doubling the income of the farmers.

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How to cite this article:

Dasiewdorshisha Sancley and Syed H. Mazhar. 2020. Constraints Faced by the Respondents in Adopting Inter-Cropping Practices of Black Pepper and Betel Vine in Arecanut Plantation in Jirang Block of Ri-Bhoi District, Meghalaya, India. *Int.J.Curr.Microbiol.App.Sci.* 9(09): 174-178.
doi: https://doi.org/10.20546/ijcmas.2020.909.021