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A STUDY ON THE EXTENT OF CONSTRAINTS PERCEIVED BY THE FARMERS IN ADOPTION OF TECHNOLOGIES IN ARECANUT IN JALPAIGURI DISTRICT OF WEST BENGAL

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ABSTRACT

The extent of five types of constraints perceived by the farmers in adoption of areca nut technologies in Jalpaiguri district of West Bengal was assessed through the data collected from 260 respondents by interview schedule method. It was found that the social constraint- Apathy towards arecanut cultivation with a score of 4.00 ranked first followed by the economic constraint-lack of support/incentives for farmers(3.87), the extension constraint- lack of sufficient training (3.78) and the Bio-physical constrain- button shedding (3.46). The least score (3.11) was assigned to the input constraint-irrigation facilities not available. This finding identified that social, extension and economic constraints are more important than input or physical constraints in adoption of arecanut technologies. The study also found a negative and significant association between farming experience, social participation, mass media exposure, educational status and most of the constraints.

Key words: Arecanut technologies, Constraints, Adoption, Ranking, Correlation, Socio-Personal traits

INTRODUCTION

Arecanut (*Areca catechu L.*) also called betel nut, is a common masticatory condiment commonly used for chewing; usually wrapped in betel leaf, called *paan*. It has wide range of socio-religious and socio-cultural uses all over the country (Balasimha and Rajagopal, 2004). An interesting fact about arecanut is that though it is grown in certain region or parts, its use is spread across all parts of the country; with the non- producing regions, consuming major share of the produce. This gives the producers or growers an advantage and therefore they have the final say on the prices.

India ranks first, both in area (3.96 lakh hectares) and production (5.59 lakh metric tons) in arecanut, with a share of 55% and 57%, respectively, in the world (Sit, A.K. *et. al.* 2012). Karnataka, Assam and Kerala are the major producing states. The share of West Bengal is 3% in area (11.47 thousand hectares) and 4% in production (22.2 thousand tons). The bulk of area and production in West Bengal is contributed by Jalpaiguri district with 24 % share in area and 30% in production.

Though the exact share of arecanut in the agrarian economy of Jalpaiguri is

not known, it is agreed upon that the crop plays an important role in the economy of the district. Many families in some parts of the district are wholly dependent on arecanut.

A number of improved technologies in various aspects of arecanut were generated and disseminated to the farmers. These technologies were supposed to increase income of the farmers by maximizing yield and controlling pests (Sit, *et. al.*, 2008). The adoptions of arecanut technologies are hampered by many bottlenecks or constraints experienced by the end-users i.e. the farmers (Sivanarayana, 2000). The productivity of arecanut in India (1189 Kg/ ha) is low as compared to China s 3752 Kg/ ha (Tamil Selvan et.al, 2004.). The reason of low productivity is, among others, non- adoption of the technologies by the farming community, which in turn is due to the constraints faced by the farmers (Jagtap, 1985). Earlier studies on the adoption pattern have identified the influence of socio- personal and socio-economic traits of the farmers on the constraints (Bose, 1964).

It is in this context that the present study was undertaken to determine the extent of constraints to adoption of improved technologies in arecanut experienced by the farming community in the district.

MATERIALS AND METHODS

The study was conducted in all the 13 blocks of erstwhile Jalpaiguri district (undivided) of West Bengal during June-2014 to February-2015. From each block, 20 farmers were randomly selected, making up the sample size of 260. The information on socio-personal attributes as well as the constraints was collected through a pre-tested interview schedule specially designed for the purpose. The degree of constraints experienced by the respondents was measured through the interval scale in which the constraints were scored as 4, 3, 2 and 1, for extreme, moderate, somewhat and negligible, respectively (Bhairamkar *et. al.*, 2011).

The data was tabulated and analyzed using frequency and mean score an correlation coefficient was worked out with the help of SPSS. Based on the mean scores, the constraints were ranked as first, second and so on and also correlated with socio-personal traits of the respondents.

RESULTS AND DISCUSSION

The results obtained from the analysis of data are presented in tabular format. The degree of five types of constraints and their association with socio- personal traits of the respondent-farmers are discussed in each section.

Extent of constraints in adoption of plantation crops technology :

The extent of constraints experienced by the respondents in respect of input aspect for adoption of plantation crops technologies has been depicted in Table 1. Among the four constraints; Non availability of irrigation facilities ranked the highest with a mean score of 3.11, followed by the constraint-High cost of inputs, ranking second with a mean score of 2.55. The least importance was attached to –Non availability of plant protection chemicals with a score of 1.52, ranking fifth. Lack of irrigation facilities and non-accessibility of the existing facilities in most of the study area explains the high score in these aspects in the table.

EXTENT OF CONSTRAINTS PERCEIVED BY THE FARMERS

Table 2 reveals the extent of constraints experienced by the respondents in respect of Technical/ extension aspect for adoption of plantation crops technologies. Among the five constraints; Lack of sufficient training; ranked the highest with a mean score of 3.78, followed by the constraint-.Inadequate extension contact, ranking second with a mean score of 3.67. Lesser importance was attached to Improper use of fertilizers/pesticides and lack of knowledge on harvesting technologies – ranking fourth and fifth respectively. Lack of irrigation facilities and non-accessibility of the existing facilities in most of the study area explains the high

Table 1. Input constraints as perceived by the respondents

n=260

Constraints	Extent of constraints					
	Extreme (4)	Moderate (3)	Somewhat (2)	Negligible (1)	Mean score	Rank
Non availability of quality planting materials	44	58	56	102	2.17	III
High cost of inputs	106	29	25	100	2.55	II
Non-availability of plant protection chemicals	04	20	84	152	1.52	V
Non-availability of organic manures	12	82	50	116	1.97	IV
Irrigation facilities not available	153	27	34	46	3.11	I

Maximum obtainable score =4.00

Table 2. Extension constraints as perceived by the respondents

Constraints	Extent of constraints					
	Extreme (4)	Moderate (3)	Somewhat (2)	Negligible (1)	Mean score	Rank
Lack of sufficient training	205	53	1	1	3.78	I
Inadequate extension contact	183	69	5	3	3.67	II
Improper use of fertilizers/ pesticides	66	95	83	16	2.82	V
Low level of knowledge in management of decision	114	87	48	11	3.17	III
Lack of knowledge on harvesting technologies	74	98	73	15	2.88	IV

Maximum obtainable score =4.00

score in the table. The two extension related constraints experienced by the respondents indicates the importance of extension work for dissemination of technologies in the area.

The social constraints experienced by the respondents in adoption of plantation crops technologies has been enumerated in table 3.. Among the eight constraints in this aspect, apathy towards plantation crops cultivation was ranked number one, with a mean score of 4.00 followed by the constraint; Low level of participation of youth, ranking second. The constraint; Switch over to other crops like Tea was ranked last with a score of 2.38. The general apathy of the respondent; particularly, youth; towards agriculture is reflected in this table.

Five constraints on economic aspects have been identified in this study (Table 4). Lack of support/incentives for farmers was ranked number one, with a mean score of 3.87 followed by the constraint; Declining yield/Low economic returns ranking second. The constraint; Market restricted to middlemen was ranked last with a score of 2.89. The high ranking of .Lack of support/incentives for farmers is indicative of almost negligible support from Government agencies.

Table 5 reveals the Bio-physical constraints experienced by the respondents in adoption of plantation crops technologies. Among the ten constraints in this aspect; Button shedding was ranked first, with a mean score of 3.46 followed by the constraint; High incidence of *Ganoderma* disease and

Table 3. Social constraints as perceived by the respondents

n=260

Constraints	Extent of constraints					
	Extreme (4)	Moderate	Somewhat	Negligible	Mean	Rank
Labour problem-high charges, inadequate availability, low output	156	54 IV	44	6	3.39	
Low level of participation of youth	154	77	26	3	3.47	II
Fragmented holdings, low investment in plantation crops(PC)	149	82	25	4	3.45	III
Low integration among various organizations	80	124	49	7	3.07	VII
Low bargaining capacity of farmers	116	107	30	7	3.28	V
Diminishing motivation among farmers about PC	126	86	32	16	3.24	VI
Apathy towards PC cultivation	156	104	46	14	4.00	I
Switch over to other crops like Tea	62	79	17	102	2.38	VIII

Maximum obtainable score =4.00

EXTENT OF CONSTRAINTS PERCEIVED BY THE FARMERS

Table 4. Economic Constraints as perceived by the respondents

n=260

Constraints	Extent of constraints				Mean	Rank
	Extreme (4)	Moderate (3)	Somewhat (2)	Negligible (1)		
Decling yield/Low economic returns	191	48	16	5	3.64	II
Price fluctuation in PC produces	113	93	37	17	3.17	IV
Lack of support/incentives for farmers	233	23	2	2	3.87	I
Low awareness about credit/ insurance	160	84	14	2	3.55	III
Market restricted to middlemen	66	114	65	15	2.89	V

Maximum obtainable score =4.00

Table 5. Bio-physical constraints as perceived by the respondents

n=-260

Constraints	Extent of constraints				Mean	Rank
	Extreme (4)	Moderate (3)	Somewhat (2)	Negligible (1)		
High incidence of *Ganoderma* disease	71	42	46	121	3.10	II
Low organic content of soil	28	41	65	126	1.89	IX
Delayed flowering/bearing	75	74	53	58	2.64	V
Leaving arecanut neglected	54	84	49	73	2.46	VI
Nutrient deficiency	49	33	60	118	2.05	VIII
Button shedding	169	57	18	16	3.46	I
Height of the crop	64	105	46	45	1.63	X
Bud rot disease	106	50	32	72	2.74	IV
Odd maturity time	43	64	56	107	2.25	VII
Drought	150	29	29	52	3.08	III

Maximum obtainable score =4.00

Drought ranking second and third respectively. The constraint; Height of the crop was ranked least with a score of 1.63.The higher rankings attached to these constraints is probably due to non-adoption of improved technologies by the respondents and lack of support/ incentives for farmers in providing

irrigation to the crops. These may be, in turn, due to inadequate extension support to the respondents.

In the overall rankings of all the constraints listed in the five aspects, above; the social constraint Apathy towards arecanut cultivation with a score of 4.00 ranked first followed by the economic constraint; Lack of support/incentives for farmers (score 3.87), the extension constraint; lack of sufficient training (score 3.78) and the Bio-physical constraint; Button shedding (score 3.46). The least score of 3.11 was assigned to the input constraint; Irrigation facilities not available.

This corroborates the findings that social and extension constraints are more important than input or physical constraints

Association of socio- personal traits of respondents with Constraints perceived by them :

In this section relationship (r value) between of socio- personal traits of respondents with five types of constraints perceived as barriers to adoption of of areca nut technologies is presented (Guilford and Fruchter, 1973).

From table 6, it is evident that the four socio-personal traits-age, farming experience, material possession and social participation scores are negatively and significantly related to the input constraint experienced of the respondent but mass media exposure bears a positive and significant relationship with this constraint. This can be explained from the fact that material possession and higher participation in social organization leads to the elimination of input constraint. On the other hand exposure to the mass media helps the respondents towards the identification of input constraints.

Educational status, material possession, social participation, extension contact and mass media exposure of the respondents bears a positive and significant relationship with social constraint; thereby contributing to the awareness surrounding their social environment thereby resulting to subsequent enhanced feeling of constraints is demonstrated in table 7. All other socio-personal traits of the respondents bear a non-significant relationship.

Table 6. Correlation between Socio-Personal traits of the respondents with Input Constraints

n=260

Socio-personal traits	*r* value
Age	-0.14751*
Educational status	-0.03829
Family members	-0.10986
Income	-0.06412
Number of coconut trees	0.04188
Number of Arecanut trees	-0.0575
Farming experience	-0.13204*
Material possession	-0.35462**
Animal possession	0.15613*
Social participation	-0.25673**
Extension contact	-0.13591*
Mass media exposure	0.25285**
Cosmopoliteness	0.04665
Information seeking behavior	-0.06254

** indicates significant at 1% level of probability

* indicates significant at 5% level of probability

It is evident from table 8 that this variable i.e. extension constraints experienced by the respondents have negative association with number of arecanut trees, farming experience and material possession; while social participation is positively related. This can be explained in the context of the fact that as the number of arecanut trees, material possession and experience increases the farmer becomes prosperous and his or her constraints are minimized.

Table 7. Correlation between Socio-Personal traits of the respondents with Social Constraints

n=260

Socio-personal traits	*r* value
Age	-0.04771
Educational status	0.26129 **
Family members	-0.06699
Income	-0.19417 *
Number of coconut trees	0.06819
Number of Arecanut trees	0.02961
Farming experience	-0.05175
Material possession	0.20049 *
Animal possession	?????
Social participation	0.15731 *
Extension contact	0.17 *
Mass media exposure	0.18826 **
Cosmopoliteness	0.15731

In case of economic constraints, the educational status and cosmopoliteness have a negative and significant relationship with this variable whereas it bears a positive and significant relationship with income as seen from table 9. Education and outgoing nature of respondents influences them to overcome the constraint.

Table 8. Correlation between Socio-Personal traits of the respondents with Extension Constraints n=260

Socio-personal traits	*r* value
Age	-0.10315
Educational status	-0.05388
Family members	-0.11307
Income	-0.05843
Number of coconut trees	0.05767
Number of Arecanut trees	-0.18904 *
Farming experience	-0.14806 *
Material possession	-0.18406 *
Animal possession	-0.02279
Social participation	0.11618 *
Extension contact	-0.19086
Mass media exposure	0.0606
Cosmopoliteness	-0.02279
Information seeking behavior	0.0547

* indicates significant at 1% level of probability

Table 9. Correlation between Socio-Personal traits of the respondents with Economic Constraints n=260

Socio-personal traits	*r* value
Age	0.09592
Educational status	-0.13764 *
Family members	0.10336
Income	0.1327 *
Number of coconut trees	0.03555
Number of Arecanut trees	0.06281
Farming experience	0.04051
Material possession	0.07228
Animal possession	0.02383
Social participation	0.0273
Extension contact	-0.02026
Mass media exposure	0.00611
Cosmopoliteness	-0.12861 *
Information seeking behavior	-0.06471

* indicates significant at 5 % level

Table 10. Correlation between Socio-Personal traits of the respondents with Bio-physical Constraints

n=260

Socio-personal traits	*r* value
Age	-0.09027
Educational status	-0.00928
Family members	-0.07958
Income	-0.04114
Number of coconut trees	0.01473
Number of Arecanut trees	-0.09426
Farming experience	-0.12525 *
Material possession	-0.25218 **
Animal possession	0.15227 *
Social participation	-0.10184
Extension contact	0.02892
Mass media exposure	-0.18276 *
Cosmopoliteness	-0.03897
Information seeking behavior	-0.01133

** indicates significant at 1% level * indicates significant at 5 % level

From table 10, it can be inferred that the socio-personal traits- farming experience, material possession, social participation and mass media exposure are negatively and significantly related to the bio-physical constraint experienced by the respondents. This can be explained in the context of the fact that higher possession of materials, higher experience and enhanced media exposure helps the respondents to overcome the constraint with regards to Bio-physical resources.

Conclusion:

In the overall rankings of all the constraints listed in the five aspects, above; the social constraint- Apathy towards arecanut cultivation with a score of 4.00 ranked first followed by the economic constraint-lack of support/ incentives for farmers, the extension constraint- lack of sufficient training and the Bio-physical constrain- button shedding. The least score was assigned to the input constraint-irrigation facilities not available.

This corroborates the findings that social and extension constraints are more important than input or physical constraints (Sivanarayana, 2000). The negative and significant association between farming experience, social participation, mass media exposure, educational status and most of the constraints suggest the importance of these traits in minimizing constraints leading to higher adoption of arecanut technologies.

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