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**Socio- psychological-techno and economical
profile of banana growing community and its
impact on adoption**

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Abstract

The present study was designed to assess the socio-psychological, economical and technological feature and its overall impacts on the adoption of banana farming community in Durg district of Chhattisgarh. The data was gathered from two selected blocks i.e., Dhamdha and Berla of Durg district and a sum of 150 banana growers were selected on random basis for generating the information as per the objectives of the investigation. Majority of the farmers interviewed had medium level of scientific orientation and medium level of overall knowledge regarding recommended banana production technology. Majority of the banana growers had medium contact with extension personnel, medium utilization of information sources. Banana growers had utilized drip irrigation method for banana production. Majority of the banana growers had medium adoption of recommended banana production technology. Correlation analysis was done and it was found that the variables land holding, annual income, credit acquisition, scientific orientation, level of knowledge and irrigation method positive and significant correlation with adoption of recommended banana production technology. Occupation has significant but negative correlation with the adoption of recommended banana production technology. Multiple regression analysis was also done to find out the quantum of contribution of the different variables in adoption of recommended banana production technology and it was found that the scientific orientation, irrigation method and level of knowledge had positive and significant contribution toward adoption of recommended banana production technology. Only one variable i.e. occupation showed negatively significant contribution towards adoption of recommended banana production technology. There is an urgent need to improve banana growers' education and knowledge level through providing education and training, skill, demonstrations, fieldtrips and proper technical guidance. The skill demonstrations on use of various practices of banana crop may therefore be helpful in increasing the adoption of recommended banana production technology.

Keywords: Adoption, banana farming, economical, socio-psychological, technological features

Introduction

Agriculture is backbone of Indian economy and majority of the rural population mainly depends on farming to satisfying and deriving the basic needs and income (Poonam and Sarkar 2015) [3]. Past trend in development of horticulture has been satisfying and this inclination has been well-marked as "Golden Revolution" with India emerging as the second largest producer of fruits and vegetables and occupying first position in several horticultural crops. Production and export of flowers have increased manifold and the country has a major stake in global trade of spices and cashew nuts. Export of medicinal plants, fruits and vegetables have also exhibited rising trend. Even though India is leading in the productivity of some horticultural crops like grapes, cassava, ginger, turmeric, etc. and still there is a scope to increase the

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productivity in other horticultural crops in compared to other countries. Today, as a result of synergy between focused research, technological, policy initiatives and high efficiency inputs, horticulture in India, has become a sustainable and viable venture especially for the small and marginal farmers.

Banana (*Musa species*) is known to grown in substantial number of country (more than 130) worldwide and large area under cultivation along the production. In Indian perspectives, it has largest share of banana production (approx 28% of global production) among the country of the world (IHD 2009) [2]. Furthermore, India has wide diversity of fruits and share about 11.8% in total global fruit production (National Horticulture Board 2009) [1]. The diversity in agro-ecological and climatic zones of the India is supportive to grow and produce diverse fruits, vegetables and other agriculture and horticulture crops. The crop banana is well suited in humid tropics to humid subtropics and semi-arid subtropics up to an elevation of 2,000 m (Poonam and Sarkar 2015) [3]. The productivity of banana has increased from 20.30 to 37MT/ha, while the area increased from 383.9 to 709 thousand hectares (IHD 2009) [2].

Banana is one of the earliest crops cultivated by human and still remains as the staple food crop for millions of people. It is an important source of high calorific energy therefore constitutes an important component of the human diet. It is not only a rich source of easily digestible carbohydrate but also provides essential vitamin B, C and several minerals such as potassium, calcium and magnesium in addition to several medicinal properties. Owing to its multifaceted uses and more significant role in the socio-economic upliftment of masses, banana is nicknamed as kalpatharu or plant of virtues. Banana is not a new herb for Chhattisgarh, it is one of the most popular fruit crops in Chhattisgarh. Different parts of banana are used very frequently in different worship ceremonies by the natives. In dense forests of Chhattisgarh, many wild species of banana are found naturally. The natives and traditional healers have rich traditional medicinal knowledge about banana in Chhattisgarh (Poonam and Sarkar 2015) [3]. They use this herb in treatment of many common and complicated diseases, both internally and externally. In Chhattisgarh region, major horticultural crops are banana and papaya. The NHM (National Horticulture Mission) also works for dissemination of banana production technology in Durg district of Chhattisgarh state, especially in Dhamdha, Berla, Patan and Durg block. The innovative fruit growers of Chhattisgarh are taking keen interest in advanced farming of banana. Many of them are growing tissue cultured banana. According to the researchers engaged in development and promotion of tissue cultured banana, this improved version is a boon for the poor farmers. Adoption of improved banana production technology is influenced by a wide range of socio-psychological, economical and technological factors. It is important to understand the roles of these factors in order to ensure the development of appropriate technologies. Therefore, the present study was carried out to serve as a guideline for research and extension workers to work in line of farmer's perspective for improving the economics and productivity by adopting suitable and recommended technology in addition to minimizing the gap in extent of adoption of banana cultivation technology.

Methodology

The methodology adopted in the present study is a field based survey and for this purpose the investigator has raised questions and interviewed people through well structure questionnaire.

Study sites

The study was conducted in Durg district of Chhattisgarh state. Durg district situated in the south-western part of the Chhattisgarh plain and characteristic feature of hilly part in the south, south-west and north-west, conferred with immense natural resources. Durg lies between 20° 23' N & 22° 02' N latitude and 80° 46' E & 81° 58' E longitude. The total geographical area of district is 8701.80 Sq. Kms. The District occupies the south-western part of the upper *Sheonath-Mahanadi* valley and the bordering hills in the south and south-west. The Chhattisgarh plain inhabit the largest area in the district.

Sampling Techniques and Data collection

Out of 12 blocks of Durg district, 2 blocks Dhamdha and Berla were selected purposively, because the maximum numbers of farmers of these blocks are involved in banana cultivation and five villages were randomly selected from each block. A list of villages where maximum banana growers are residing was obtained from the horticulture department officials and five villages were randomly selected from each block (from the list of villages). Thus total 10 villages (Ahiwara, Banburad, Bagdumar, Nandani, Aheri, Sodh, Patharpunj, Silghat, Devri & Matia) were selected for the study. A list of banana growers of the selected 10 villages was obtained from RHEO/ ADO (Hort.). Fifteen banana growers were randomly selected from each selected village. Thus total 150 banana (15 x 10) growers were considered as respondents and they were interviewed to collect the primary data on the basis of objectives and variables of the study. The data were tabulated and analyzed statistically to draw appropriate conclusions.

Data processing and statistical framework

The data collected during the course of investigation was tabulated into the coding sheet and then appropriate analysis of data was made according to objectives. The statistics applied were percentage, frequency, mean, standard deviation, coefficient of correlation, multiple regression etc. the analysis was carried out with help of Computer. Frequency and percentage were used for making simple comparison. Mean of sample and standard deviation were calculated. Pearson's coefficient of correlation was used to find out the relationship between two variables. Multiple regressions was used to know the partial and complete influence of independent variables.

Results and Discussion

Psychological Characteristics of the respondents

Scientific-orientation: Scientific orientation refers to the degree to which an individual is inclined to use scientific method in farming and decision-making. The results in the Table 1 showed that majority of the respondents (64.00%) had medium level of scientific-orientation, followed by 23.33 per cent had low level of scientific-orientation, while 12.67 per cent of respondents had high level of scientific-orientation regarding banana production technology. It can be concluded that majority of the respondents came under the medium level of scientific-orientation category. The reason of medium and low level of scientific orientation of banana growers might be due to the fact that the only 15.33 per cent banana growers had college and above level of formal education. This finding is in line with Tiwari *et al.* (2007) [4] observed that 1.21 per cent had low scientific orientation, whereas 70.75 per cent

had medium and 28.04 per cent of respondents found in high scientific orientation category.

Table 1: Distribution of respondents according to their scientific orientation

Scientific-orientation	Frequency	Per cent
Low (upto 15 score)	35	23.33
Medium (16– 22 score)	96	64.00
High (above 22 score)	19	12.67
Total	150	100.00
\bar{X} = 18.27	S.D.=3.68	

Level of knowledge of the respondents: The data presented in Table 2 indicated that out of total respondents majority (70.67%) of them had medium level of knowledge regarding recommended banana production technology. Whereas 18.00 per cent and 11.33 per cent of the respondents were having low and high level of knowledge, respectively. It can be concluded that most of the respondents had medium to high level of knowledge and about eighteen per cent of the respondents had low level of knowledge regarding recommended banana production technology.

Table 2: Over all level of knowledge regarding recommended banana production technology

Level of knowledge	Frequency	Per cent
Low (upto 34 score)	27	18.00
Medium (35-43 score)	106	70.67
High (above 43 score)	17	11.33
Total	150	100.00
\bar{X} = 38.04	S.D.=4.85	

Ongoing into the minor details of practice wise level of knowledge regarding recommended banana production technology reveals that majority of banana growers had high level of knowledge on propagation method (79.33%), cutting-pruning and stacking (64.67) and irrigation management (59.33%).), whereas, the respondents who had medium level of knowledge regarding practices of banana production technology i.e. planting method (68.67%), yield (62.67%) and time of harvesting (57.33%) and respondents had low level of knowledge regarding selected practices of banana production technology i.e. usages of banana (94.00%), storage of banana (92.00%), use of manure at the time of field preparation (62.00%). The reasons observed for the low level of knowledge of usage and storage of banana through personnel discussion by researcher was harvested crop direct send to market for sell so that there were no needs of storage of banana.

Socio-economic characteristics of respondents

The independent variables i.e. size of land holding, occupation, annual income, and credit acquisition were considered as socio-economic characteristics of the respondents.

Size of land holding: It is apparent from the Table 3 that 74.00 per cent of the respondents had large size of land holding (above 4 ha), followed by 26.00 per cent who belonged under medium size of land holding and none of the respondents were found in marginal and small size of land holding category. It could be concluded from the table that maximum number of respondents had large size of land holding.

Table 3: Distribution of respondents according to their size of land holding

Size of land holding	Frequency	Per cent
Marginal (upto 1 ha)	00	00.00
Small (1.1 to 2 ha)	00	00.00
Medium (2.1 to 4 ha)	39	26.00
Large (above 4 ha)	111	74.00
Total	150	100

Occupation of Respondents: It is observed from Table 4 that majority of the respondents (66.00%) were involved in farming + others, followed by farming + animal husbandry + service (14.00%), farming + business + service (10.67%), farming + service (09.33%) and none of the respondents were found in farming and farming + labour category, respectively as their main occupation. In other occupations the respondents were mostly cultivating other crops such as paddy, vegetables like cabbage, bottle gourd, chilli, tomato etc. and fruit crops like papaya etc. It may be concluded that majority of respondents (66.00%) had other occupation in addition to farming (banana cultivation) as their main source of livelihood.

Table 4: Distribution of respondents according to their occupation

Occupation	Frequency	Per cent
Farming (banana cultivation)	00	00.00
Farming + Labours	00	00.00
Farming + Service	14	09.33
Farming + Animal husbandary + Service	21	14.00
Farming + Business + Service	16	10.67
Farming + Others	99	66.00
Total	150	100.00

Annual income of respondents: Annual income of family helps to project the overall economic position and it is an indicator of the economic stability of the family. The distribution of the respondents according to their annual income is presented in Table 5. It was found that majority (64.00%) of the respondents were having their annual income between Rs.4.1 to 12 lakh followed by 23.33 per cent of respondents who were having their annual income upto 4 lakh. Whereas 12.67 per cent of respondents were having their annual income above Rs.12 lakh. The results clearly indicated that majority of the respondents belonged to Rs. 4.1 to 12 lakh annual income group.

Table 5: Distribution of respondents according to their annual income

Annual income	Frequency	Per cent
Upto Rs.4 lakh	35	23.33
Rs.4.1 to 12 lakh	96	64.00
Above Rs.12 lakh	19	12.67
Total	150	100
\bar{X} = 7.87	S.D. = 4.10	

Credit acquisition pattern of respondents: The data presented in Table 6 reveals that majority of the respondents (69.33%) had acquired the credit, whereas, only 30.67 per cent respondents had not acquired the credit. Out of the credit acquiring respondents (total 104) the majority of the respondents (69.23%) had taken the short term credit followed by medium term credit (20.19%) and long term credit (10.58%). It can be concluded that majority of the respondents had acquired short term credit while small

percentage of the respondents had acquired long term credit. The acquired short term credit might have been taken for purchasing seeds, fertilizers, while long term credit might have been taken for irrigation facilities or buying implements etc. In case of sources of credit the maximum number of the respondents (61.54%) had acquired credit from the co-operative society followed by 17.31 per cent of respondents who had taken credit from nationalized bank, 13.46 per cent of respondents had taken credit from friends, neighbour, relative and others while only 07.69 per cent of the respondents had taken credit from money lenders. This reveals that the respondents were aware about the source of credit and facilities provided by co-operative societies and nationalized banks. In case of availability of credit out of the total respondents who had acquired credit majority of the respondents (77.88%) had acquired credit easily whereas, 22.12 per cent of the respondents have not acquired it so easily. It can be concluded that majority of the respondents had acquired short term credit; cooperative society was the major source of credit and the credit facilities were available to them very easily and quickly.

Table 6: Distribution of respondents according to their credit acquisition

Particulars	Frequency	Per cent
Credit acquisition		
Not acquired	46	30.67
Acquired	104	69.33
Duration of credit (n=104)		
Short term	72	69.23
Mid term	21	20.19
Long term	11	10.58
Source of credit (n=104)		
Co-operative society	64	61.54
Nationalized bank	18	17.31
Money lender	08	07.69
Friends/neighbour/ relatives/ others	14	13.46
Availability of credit (n=104)		
Easy	81	77.88
Difficult	23	22.12

Technological characteristics of the respondents

Table 7: Utilization of irrigation method for banana production by respondents

Irrigation Method	Frequency	Per cent
Flood Irrigation	00	00
Border Irrigation	00	00
Furrow Irrigation	00	00
Basin Irrigation	00	00
Ring Irrigation	00	00
Sprinkler Irrigation	00	00
Drip Irrigation	150	100
Total	150	100

Irrigation Method: It is apparent from the Table 7 that cent per cent of the respondents (100%) had utilized drip irrigation method for banana production. None of the respondents were found to use any other method of irrigation for banana production. It was observed during the data collection that farmers cultivate banana crop on their farm if they had facility of drip irrigation. This can be attributed to the findings of Table 3 that majority of respondents had large land holding. As Timbadia *et al.* (2008) [5] observed that in general, farmers opined that they could save water above 25 per cent, weed control expenses by 51 to 75 per cent and labour charges to

the extent of 26 to 50 per cent along with increase in the crop yields. The farmers were of the opinion that though higher fruit yield of banana with drip method was obtained in comparison to surface method, there is further scope to increase the fruit yield of banana.

Socio- psychological-techno and Economical characteristics of banana growers and its Impact on adoption of recommended banana production technology:

Table 8: Correlation analysis of Socio- psychological-techno and Economical characteristics of banana growers with adoption level of recommended banana production technology

S.N.	Independent variables	Coefficient of correlation "r" value
1	Scientific orientation	0.6213**
2	Knowledge level	0.9585**
3	Land Holding	0.5428**
4	Occupation	-0.3590**
5	Annual income	0.6662**
6	Credit acquisition	0.5596**
7	Irrigation Method	0.2015*

**Significant at 0.01 level of probability;

*Significant at 0.05 level of probability

The coefficient of correlation result reveals that the variable irrigation method were found positively and significantly related with adoption at 0.05 per cent level of significance. The significant relationship shows that when the level of the above variables viz. irrigation method increases then the adoption of recommended banana production technology of the respondents will increase.

However, the variables land holding, annual income, credit acquisition, scientific orientation, and knowledge were found positively and significantly correlated with adoption at 0.01 per cent level of significance. Occupation has significant but negative correlation with the adoption of recommended banana production technology at 0.01 level of significance.

The above results showed that when the land holding, annual income, credit acquisition, scientific orientation, and knowledge of the respondents increases then the adoption of the respondents correspondingly increase but when respondents engage in more than one occupation so adoption of respondents correspondingly decreases.

The results of multiple regression reveals that out of the seven variables under study only two variables namely annual income and knowledge had positive and significant contribution towards adoption at 0.01 per cent level of significance. four variables namely land holding, credit acquisition, scientific orientation and irrigation method had significant and positive contribution towards adoption at 0.05 per cent level of significance and only one variable i.e. occupation contributed negatively and significantly toward adoption of banana production technology.

Conclusion

On analyzing the data it was found that majority (64.00%) of the respondents had medium scientific orientation and 70.67 per cent of the respondents had medium overall level of knowledge about recommended banana production technology. The study revealed that majority (66.00%) of the respondents practiced farming + others as the principal occupation with 64.00 per cent recording an annual income between Rs. 4.1 to Rs. 12 lakh. 74.00 per cent respondents had large sized (above 4 hac) land holding. When credit acquisition was analyzed it was found that 69.23 per cent respondents had acquired short term credit, 61.54 per cent

respondents utilized cooperative society as their main source of credit and majority of respondents (77.88%) believed that the availability of credit was very easy and quick. Cent per cent of the respondents (100%) had utilized drip irrigation method for banana production. None of the respondents were found to use any other method of irrigation for banana production. From the results of correlation and multiple regression analysis it can be concluded that if the level of knowledge of banana growers regarding recommended banana production technology is expanded, the extent of adoption will also be increased. There is an urgent need to improve their education and knowledge level through providing education and training, skill, demonstrations, fieldtrips and proper technical guidance. The skill demonstrations on use of various practices of banana crop may therefore be helpful in increasing the adoption of recommended banana production technology.

Suggestions for future action: The findings of the study showed that majority of the banana growers came under medium level of adoption category; they were not using recommended technology fully. It is necessary to convince the banana growers with the help of various extension efforts should be made like kisan mela, exhibition, group discussion, film shows and organization of demonstrations on improved technologies of banana crop in the villages with the help of extension agents, uses of information sources in time and contact with other developmental organizations for providing the facilities and proper guidance to the banana growers regarding adoption of recommended banana production technology.

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