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MAHARASHTRA SOCIETY OF EXTENSION EDUCATION
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College of Agriculture, Pune-411005
Maharashtra, India

Editorial

Maharashtra Society of Extension Education (MSEE) registered in 1982, has the foremost objective to publish the research journal. Accordingly, the society was publishing the journal entitled Maharashtra Journal of Extension Education. Since the year 2004 this journal has been renamed as Asian Journal of Extension Education.

The journal includes research articles form the researchers and extension workers in the field of extension education from various faculties of various institutes in the country. Extension education plays an important role not only in transfer of innovative technologies but also in developing appropriate methodology in the field of extension more suited for field application. The innovative research methods can be very well communicated for its application and use in further research by the extension fraternity. This can be achieved by publishing research articles.

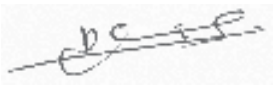
Asian Journal of Extension Education is a very humble attempt to provide platform towards this goal of networking with the all extension professionals who could kindle the minds of their peers and young scientists through their research articles.

I have immense pleasure to present this 34th issue of Asian Journal of Extension Education for the year 2016. The Journal has received an encouraging response from all corners of the country. We have made an effort to encompass the best articles for the issue. Thanks are due to all the authors who have contributed for this issue.

I extend sincere thanks to Dr. A. G. Sawant, Hon'ble President, Maharashtra Society of Extension Education, Dr. K. D. Kokate, Hon'ble DEE, MPKV, Rahuri and Former DDG (Agril. Extn.) ICAR, New Delhi and Dr. R. R. Sinha, Vice President, MSEE for their constant inspiration, valuable guidance and concrete suggestions to maintain the quality of the journal.

I appreciate the tireless contribution of my colleagues and Joint-Secretary Dr. H. P. Sonawane and Shri. S. S. Neware for their endless efforts in publishing this issue.

I am confident that this issue of the Journal will be appreciated by the extension scientists, researchers, students and readers for its usefulness and contents. I solicit their suggestions for further enhancement of quality of the Journal.



V. S. Shirke
Editor

College of Agriculture, Pune
Date: 7, December 2016

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RESEARCH ARTICLE

Leadership Behaviour of Zonal Agricultural Extension Agents in Kwara State, Nigeria

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ABSTRACT

Researchers have claimed that never before has strong leadership being more of a necessity than it is in our current age. The study examined the leadership behaviour employed by Kwara State's Zonal Agricultural Extension Agents (ZEAs). A random sampling technique was used to select 70 extension agents from 4 agricultural zones of the state in order to confirm the leadership behaviour they exhibit in the discharge of their extension activities. The result showed that out of the 30 behavioural statements, most of the respondents recorded higher disposition only in 11 behaviour such as persuades a followership towards a common goal (M=4.1250), searching for opportunities (M=4.0625), creates a followership towards a common goal (M=4.1406), encourage team work (M=4.0154), strengthening others (M=4.0625), helps others see their progress toward bigger goal (M=4.0781), sets the example (M=4.1875), always aim at winning (M=4.2813), never afraid to offer thanks or congratulations (M=4.0313), recognizes individual contribution (M=4.0000) and build trust in the organization (M=4.2813) while other behaviour were below higher scores. It is therefore recommended that on-the job training and retraining courses on leadership practices and behaviour should be introduced among the extension agents to acquire more relevant knowledge and skills necessary for effective leadership role in the course of their extension activities. The importance of leaders creating effective followers and reflecting problem-solving back to those followers has received much attention recently. Brown (1996) in his work sees effective leaders as encouraging and supporting workers to solve their own problems, so promoting the development of a problem-solving team. This will not work if there is an emphasis on status and control. Leaders, in this situation, are seen instead as facilitators of change rather than as the square-jawed decision-makers' of the past. This view of leadership means giving up any notion of 'always knowing best' and acknowledges that uncertainty, doubt and bewilderment are as important as energy and direction. Leadership is seen as something of a dance between knowing and not knowing. Leadership may be seen, therefore, as being about establishing what followers want and satisfying that through some process of exchange in which both sides can win.

Then, the achievement and credibility of extension services today, and in the past have to do with its ability to adapt and appropriately respond to the dynamics of its environment (Schauber and Castania, 2001). The increasingly competitive environment has demanded that many organisations undergo significant and profound change. Therefore extension is undergoing such a period of transition (Sanggin, 1993). The purpose of this study is to examine the leadership behaviour of Kwara State's Zonal agricultural extension agents. The specific objectives were to: Identify socio-economic characteristics of the zonal extension agents; ascertain the leadership behaviour of the zonal agricultural extension agents' and Determine significant relationship between some selected socio-economic characteristics of the zonal extension agents and their leadership behaviour.

***Keywords:** Leadership Behaviour, Agriculture, Zonal Extension Agents.*

METHODOLOGY

There are four agricultural zones in Kwara State and these are: A, B, C and D which have their headquarters in Kaima, Patigi, Malete and Igbaja respectively. All the four zones were included in the study. A random sampling technique was used to select 9 extension agents from zone A, 17 extension agents from zone B, 21 extension agents from zone C while 23 extension agents were selected from zone D. The total sample size was 70.

Data was collected using a structured questionnaire to elicit information on personal characteristics of the extension agents. And 5- point likert type scale instrument based on leadership practices and behaviour designed by Kouzes and Posner (1995) was used to collect information about leadership behaviour of zonal extension agents. It includes 5 leadership practices with 30 behavioural statements necessary for the assessment of leadership behaviours of the zonal agricultural extension agents.

Respondents were asked to rate themselves on behavioural statements as follow: Always = 4, Fairly often = 3, Sometimes = 2, Once in a while = 1, Not at all = 0.

In analysing the results, the mean scores falling below 3.0 is considered to indicate a low propensity to display a particular behaviour while a mean score of 4.0 and above would indicate a high disposition towards exhibiting the behaviour. Mean scores between 3.0 – 3.9 are considered to be medium.Data collected were subjected to statistical tools such as the percentage, frequency counts, mean scores, and Karl Pearson's coefficient of correlation.

Fig. 1: Kwara ADP Zones and their Headquarters

Zone	Local Government	Zonal Headquarters
A	Baruten, Kaiama	Kaiama
B	Patigi, Edu	Patigi
C	Asa, Ilorin West, Ilorin South, Ilorin East, Moro	Malete
D	Ekiti, Ifelodun, Irepodun, Oke-Ero, Offa, Oyun, Isin	Igbaja

Source: KWADP (2011) Annual Report

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents:

Table 1 .Socio-economic characteristics of the respondents

Variable		Frequency (n = 70)	Per cent
Zone	A	9	12.85
	B	17	24.29
	C	21	30.00
	D	23	32.86
Age (years)	21 – 30	14	21.9
	31 – 40	26	40.6
	41 – 50	23	35.9
	51 – 60	1	1.6
Gender	Male	51	79.7
	Female	13	20.3
Marital Status			
Married		51	79.7
Single		9	14.1
Widowed		2	3.1
Divorced		2	3.1
Rank			
Extension agent		50	78.1
Block Extension agent		4	6.3
Block Extension supervisor		5	7.8
Subject Matter Specialist		5	7.8
Area of specialization			
Agronomy		38	59.4
Forestry		7	10.9
Fishery		4	6.3
Livestock		3	4.7
Horticulture		4	6.3
Home Economics		8	12.5
Highest educational level			
Field Overseer		18	28.1
Certificate		19	29.7
OND		20	31.3
B.Sc., B. Agric.		7	10.9
Year of Experience			
1 – 9		10	15.6
10 – 18		24	37.5
19 – 27		5	7.8
28 – 36		1	1.6

It shows that most of the extension agents are from zone D (36%) followed by zone C (28%), while only (27%) are in zone B and zone A has the least extension agents (9.4%). This implies that the Kwara ADP has most of its extension activities concentrated in zone D and C respectively. Majority

of the extension agents were between 31 – 40 years old (40.6%), meaning that the extension agents were still young, more energetic and productive. Majority of the extension agents (79.7%) were male and 20% were female, this implies that the Kwara ADP extension system was male dominated. However, of the 64 extension agents almost 80% were married while only 14.1% were single and 3.1% each were widowed and divorced. This study revealed that 78% of the respondents were village extension agents, 6% were block extension agents, 8% were block extension supervisors, while 8% were subject matter specialists (SMS). This distribution may be beneficial to the rural farmers if the village extension agents that have direct contacts with the farmers are favourably predisposed to their duties and emphasis must be on their welfarism in performing effectively.

Fifty nine per cent of the extension agents specialised in agronomy, 13% were home economists, 11% specialised in forestry, 6% each were in fishery and horticulture while 5% were in livestock. It was found that 28% of the respondents had field overseer certificates, 30% had Ordinary National Diploma, while 31% had degree and 11% had other qualifications.

Leadership Behaviour of Zonal Agricultural Extension Agents:

Table 2 shows the mean score analysis of the leadership behaviour of zonal agricultural extension agents. Out of the 30 behavioural statements, the zonal extension agents recorded high disposition to eleven (11) behaviours these were: persuades a followership towards a common goal (M=4.1250), searching for opportunities (M=4.0625), creates a followrship toward a common goal (M=4.1406), encourage team work (M=4.0154), strengthening others (M=4.0625), helps others see their progress toward bigger goal (M=4.0781), sets the example (M=4.1875), always aim at winning (M=4.2813). Others are never afraid to offer thanks or congratulations (M=4.0313), recognizes individual contribution (M=4.0000) and build trust in the organization (M=4.2813). This implies that there is a wide gap in their disposition to leadership behaviours and the leadership practices.

Table 2 Leadership Behaviour of Zonal Agricultural Extension Agents

Practices and Behaviours	**M**
(a) Challenging the process	
Always looking for innovation	3.5156
Not afraid to take risk	3.8906
Knows that failure is inevitable	3.4375
Approach failure as learning experience	3.5156
Searching for opportunities	**4.0625***
Experimenting for opportunities	3.9531
Total	**21.3749**
(b) Inspiring a shared vision	
Makes organisation a reflection of the whole instead of an ideal of the leaders	3.5469
Ability to see what can be, while enlisting the creative energy of others.	3.8281
Persuades a followership towards a common goal	**4.1250***
Creates a followership toward a common goal	**4.1406***
Envisioning the future	3.8594
Enlisting others	3.8125
Total	**23.3125**
(c) Enabling others to act	
Delegates power to constituents to perform at their highest potential	3.5000
Builds team	3.7500
Encourage team work	**4.0156***
Develops individual strengths by helping others to contribute to the organisation.	3.9219
Fostering collaboration	3.2813
Strengthening others	**4.0625***
Total	22.**5313**
(d) Modelling the way	
Follows same rules and guidelines set forth for everyone in the organisation.	3.7188
Sets high standards for organisational performance.	3.7188
Helps others through bureaucratic stumbling blocks	3.8750
Practices and Behaviours	
Sets the example	**4.1875***
Always aim at winning	**4.2813***
Total	**23.8595**
(e) Encouraging the heart	
Never afraid to offer congratulations	**4.0313***
Recognises individual contribution	**4.0000***
Celebrates organisational wins	3.6250
Makes everyone feel as they are valued	3.2188
Celebrates team accomplishments	3.8125
Build trust in the organisation.	**4.2813***
Total	**22.9689**

M = Mean. *Significance level = 5%. Relationship between Selected Socio-economic characteristics of respondents and their Leadership Behaviour:

Table 3 reveals the summary of Karl Pearson's correlation coefficient result on the test of relationship between selected personal characteristics of ZEAs and their leadership behaviour. It shows that the relationship were significant at 1% level of significance.

The relationship between age and leadership behaviour of the respondents were found to be negative and statistically significant to the test. This indicates that old age affects leadership behaviour. The older people may have less or poor inclination to display leadership behaviour in the course of their duties. Thus, this is concluded that younger respondents were having strong inclination for leadership behaviour because they are at the prime of their careers unlike the older ones who have reached the climax point.

Those extension agents with higher years of experience may not have so much interest in showing leadership behaviour in their dealings. This is then concluded that the lower the years of experience the higher the propensity to display the leadership behaviour.

Table 3 Relationship between selected socio-economic characteristics of ZEAs and their Leadership Behaviour

Variables	'r' Value
Age	**-0.32****
Highest Educational Level	**0.24****
Years of Experience	**-0.35****

****Significance Level = 0.01**

CONCLUSION

The findings of this study revealed that most of the respondents were male, young and educated. Majority of them were also Village Extension Agents (VEAs), agronomists and had spent between 10 to 18 years in the profession. Then, age and years of experience of the respondents can hinder higher propensity to display leadership behaviour. And higher level of education of respondents can influence positively higher inclination to exhibit leadership behaviour. Extension agents' higher disposition to leadership behaviour was very low according to the number of behavioural statements in which they were rated. This means that, there is still a large room for them to improve on their leadership behaviour.

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RESEARCH ARTICLE

Adoption of Lac Production Technology in Bastar District of Chhattisgarh

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ABSTRACT

A study was conducted in Bastar district of Chhattisgarh to ascertain the extent of adoption of recommend Lac production technology. An interview schedule consisting of various types of questions related to the objectives of the study was developed and the primary data was collected from the selected sample of 160 Lac growers by personally interviewing each of the respondents. The data was statistically analysed and it was found that around 68 per cent of the respondents had medium adoption of recommended lac production technology. The variables knowledge, cosmopoliteness, scientific orientation and contact with extension agencies were found positively and significantly correlated with adoption at 0.01 per cent level of significance. . It was also observed that knowledge, scientific orientation and contact with extension agencies showed positive and significant contribution towards adoption at 0.01 per cent level of significance. Adoption percentage was low in case of spraying of insecticide, use of synthetic net and spray of fungicide by trained lac growers due to unavailability of these inputs in local market. Higher adoption rate of improved lac cultivation practices was found to be contributing significantly towards higher income and employment generation of trained lac growers in comparison to that in case of untrained lac growers. Keeping the above facts in mind, the study was conducted in Bastar district of Chhattisgarh state with the objectives:-to determine the extent of adoption of recommended lac production technology among the lac growers and to find out the relationship between independent and dependent variables.

Keywords: *Adoption, Lac Production Technology*

METHODOLOGY

The study was conducted in Bastar district of Chhattisgarh state during year 2012-2013. Bastar district is situated in southeastern part of Chhattisgarh state. The district is bound by the state of Odisa on its east and to its east west lies Maharashtra. Bastar has an area of 8755.79 sq. km with more than 75 % forest cover (about 6654.24 km^2 forest area) and lies between north latitude 18^0 38, 8.5 and 20^0 14, 51.29. Bastar district has 7 blocks namely Jagdalpur, Bastar, Bakawand, Lohndiguda, Tokapal, Darba, Bastanar, out of these 7 blocks , only one block namely Jagdalpur was selected purposively for the study. Out of the total villages of Jagdalpur block, only eight villages were selected purposively. The lists of villages for the study are Machkot, Zeeragaon, Bamni, Kumbli, Kurandi, Jadiguda, Chawkavada and Pushpal. A list of lac growers of the selected 08 villages was obtained from lac facilitator and 20 lac growers were randomly selected (from the given list) from each selected village. Thus total 160 lac (20 x 08) growers were considered as respondents for the study. The information relevant to the study objectives was to be collected from farmers. An appropriate data collection tool was therefore, to be developed and used. An interview schedule was the only appropriate tool. An interview schedule consisting of various types of questions related to the objectives of the study was, therefore

developed. Initially the schedule was developed in English and was then translated to the local language *i.e.* Hindi.

Extent of adoption regarding recommended lac production technology by lac growers

Adoption is mental process through which an individual passes from hearing about an innovation to final adoption (Rogers, 1995).It was operationalized as the degree of the use of recommended practices. Adoption refers to the extent of use of recommended practices of lac production by lac growers. Extent of adoption of respondents about practices in lac production was measured by taking into consideration the recommended package of practices for higher production of lac which was released by Indian Institute of Natural Resins and Gum, Ranchi.

To measure extent of adoption, 28 important recommended practices were listed and responses for each practice were obtained on three point scale as under:

Categories	Score
Not adopted	1
Partially adopted	2
Fully adopted	3

The farmer's extent of adoption was ascertained in terms of selected practices of lac production technologies adopted. The adoption index was worked out as follows:

Adoption Index =	Sum of adoption score actually obtained by the respondent / Maximum possible adoption score obtainable by the respondent	100

The respondents were classified into three categories by using following formula:

A.I. = Mean ($\overline{X}$) ± S.D. (Standard Deviation)

Categories	
Low level of adoption	(< $\overline{X}$ – S.D.)
Medium level of adoption	(Between $\overline{X}$ ± S.D.)
High level of adoption	(> $\overline{X}$ + S.D.)

RESULTS AND DISCUSSION

Extent of adoption recommended lac production technology:

Over all extent of adoption is clearly indicated from the data presented in Table 1. Majority (68.75%) of them had medium level of adoption about recommended lac production technology. It was also observed that 20.00 and 11.25 per cent of the respondents had low and high level of adoption respectively.

Table 1: Distribution of respondents according to their extent of adoption (n=160)

S.N.	Adoption level	Frequency	Per cent
1.	Low (below 40 score)	32	20.00
2.	Medium (40-56 score)	110	68.75
3.	High (above 56 score)	18	11.25
	Total	**160**	**100.00**

X =48

It can be concluded that majority of the respondents have medium level of adoption regarding recommended lac production technology. While around 20.00 per cent respondents reported low level of adoption. Medium to high adoption may be due to the fact that the respondents possessed better utilization of information sources from forest department, better utilization of credit, better cosmopoliteness and better scientific orientation towards technologies used for lac production.

Correlation between independent variables with adoption of recommended lac production technology

Table 2: Correlation analysis of recommended lac production technology

Sr. No.	Independent variables	Coefficient of correlation "r" value
1.	Age	-0.126
2.	Education	0.125
3.	Family size	0.046
4.	Social participation	0.100
5.	Occupation	0.042
6.	Annual income	0.191*
7.	Size of land holding	0.024
8.	Credit acquisition	0.050
9.	Knowledge	0.904**
10.	Cosmopoliteness	0.623**
11.	Scientific orientation	0.756**
12.	Contact with extension agencies	0.505**
13.	Sources of information	0.045

** Significant at 0.01 level of probability * Significant at 0.05 level of probability

The result from table 2 reveals that the variables age, education, family size, social participation, occupation, size of land holding, credit acquisition

and sources of information were found to have no significant relationship with adoption. But, annual income was found positively and significantly related with adoption at 0.05 per cent level of significance. The positively significant relationship shows that when the level of the above variable i.e. annual income increases then the adoption of the respondents will increase. However, the variables knowledge, cosmopoliteness, scientific orientation and contact with extension agencies were found positively and significantly correlated with adoption at 0.01 per cent level of significance.

The above results showed that when the annual income, knowledge, cosmopoliteness, scientific orientation and contact with extension agencies of the respondents increase then the adoption of the respondents regarding lac production technology correspondingly increase. Findings clearly indicated that out of the thirteen independent variables only five were positively and significantly related with adoption of recommended lac production technology.

The R^2 value of 0.869 indicates that all the 13 independent variables jointly contributed towards adoption of recommended lac production technology to the extent of 86.90 per cent.

The data presented in table 3 reveals that out of the thirteen variables under study only two variables namely annual income and cosmopoliteness had positive and significant contribution towards adoption at 0.05 per cent level of significance. It was also observed that knowledge, scientific orientation and contact with extension agencies showed positive and significant contribution towards adoption at 0.01 per cent level of significance. Rest of the eight variables namely age, education, family size, social participation, occupation, size of land holding, credit acquisition and sources of information had no significant contribution towards adoption.

Table 3: Multiple regression analysis of independent variables with adoption

S.N.	Independent variables	Regression coefficient "b" value	"t" value
1.	Age	-1.021	1.637
2.	Education	-0.906	-0.319
3.	Family size	0.021	0.140
4.	Social participation	-0.211	-0.736
5.	Occupation	-0.151	-0.484
6.	Annual income	2.201*	2.377
7.	Size of land holding	-0.011	-0.065
8.	Credit acquisition	0.096	0.101
9.	Knowledge	0.585**	13.038
10.	Cosmopoliteness	1.983*	2.155
11.	Scientific orientation	0.433**	4.551
12.	Contact with extension agencies	2.413**	2.906
13.	Sources of information	0.728	1.693

** Significant at 0.01 level of probability
* Significant at 0.05 level of probability

CONCLUSION

The findings of the study reveal that there is a good scope for enhancing lac production in the district. Lac production can play a very important role in improving the socio-economic life of rural people who live nearby forest side in Bastar district. It provides additional income apart from cultivation of crops and in case of drought situations too.

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RESEARCH ARTICLE

Impact of Krishi Vigyan Kendra Programmes on Beneficiaries

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ABSTRACT

The present study was conducted in Krishi Vigyan Kendra, Aurangabad of Marathwada region in Maharashtra state. Out of 11 KVK in Marathwada region, Krishi Vigyan Kendra, Aurangabad was selected purposively for the present study. Six adopted and non-adopted villages with same ecological situation were purposively selected. Ten farmers were selected randomly from each Krishi Vigyan Kendra adopted village and ten farmers were selected from each from non-adopted villages each. Total sample of the study consist of 120 farmers. Front line demonstration programme on cotton organized by KVK, Aurangabad was considered to see the impact on knowledge of the beneficiaries. Ex-post facto research design was used for present study. The data were collected with the help of structured interview method with the help of interview schedule. It is revealed that majority of the beneficiaries (76.66%) and non-beneficiaries (65.00%) were from medium farming experience, whereas 35.00 per cent of beneficiaries and 28.33 per cent of non-beneficiaries were having education up to secondary level, 28.33 per cent of beneficiaries and 30.00 per cent of non-beneficiaries were having 'semi-medium' land holding. It also indicated that majority of beneficiaries (68.33%) and non-beneficiaries (65.00%) had 'medium' annual income, 65.00 per cent of beneficiaries and 61.66 per cent non-beneficiaries had 'medium' social participation, 73.33 per cent of beneficiaries and 71.66 per cent non-beneficiaries had 'medium' extension contact. Regards to knowledge level of the farmers about cotton cultivation, 76.66 per cent of beneficiaries and 51.66 per non-beneficiaries had 'medium' impact of knowledge.

Keywords: *Impact, Krishi Vigyan Kendra, Beneficiaries*

The National Commission on Agriculture (1971-73) recommended that by the end of Sixth Five Year Plan one Krishi Vigyan Kendra must be established in each district of the country. For speedy implementation of this scheme, the Director-General, Indian Council of Agricultural Research, constituted a Committee (1973) under the Chairmanship of Dr. Mohan Sinha Mehta to work out the details for the establishment of the Kendras. The first Krishi Vigyan Kendra was established in 1974 at Pondicherry under the administrative and supervisory control of the Tamil Nadu Agricultural University, Coimbatore. By the end of June, 2015, 641 KVKs were functioning in India out of which 44 were in Maharashtra and 11 KVKs were in Marathwada region. Effective action plan depends on the translation of the technology to those for whom it is meant. It is proven fact that adoption of technology be hasten by identifying the needs of training effectively to all those who need the same, so it is essential for accelerating the process of adoption which leads to increase agricultural production. The KVKs have to play four important functions i.e. demonstrations, vocational training to farmers and farm women, in service training to extension workers and on farm trials. These functions play crucial role to set the stage for innovation dissemination system in action. The KVK is one of the first line innovative schemes of the ICAR devoted to vocational training of the practicing farmers, farm women and young farmers. The approach and methodology is unique. The KVK in the country are the primary links for the farmers to know about the agricultural technologies being generated. The present study was conducted with the following specific objective:1. To study the profile of beneficiaries and non-beneficiaries of Krishi Vigyan Kendra.2. To study the impact of extension programmes on beneficiaries of Krishi Vigyan Kendra.

METHODOLOGY

The present study was conducted during 2015-16 in Marathwada region of Maharashtra state. Out of eleven KVKs in Marathwada region, Krishi Vigyan Kendra, Aurangabad was selected purposively for the present study. Six adopted and six non-adopted villages with same ecological situation were purposively selected under the jurisdiction of Krishi Vigyan Kendra. Ten farmers from each Krishi Vigyan Kendra adopted village and 10 each from non-adopted villages were selected randomly, each total to the tune 60 + 60=120 sample. Front line demonstration programme on cotton production technology organized by KVK, Aurangabad was considered to see the impact of FLD on knowledge of the beneficiaries. Ex-post facto research design was used for present study. The data were collected with the help of structured interview method with the help of interview schedule. Data was classified, tabulated and analyzed by using methods mean, frequency, percentage, standard deviation, coefficient of correlation and Fisher's 'Z' Test.

RESULTS AND DISCUSSION

1. The profile of the farmers.

It was observed that majority of the beneficiaries (76.66%) and non- beneficiaries (65.00%) were from medium farming experience category. Whereas, 20.00 per cent of beneficiaries and 11.66 per cent of non-beneficiaries were found in high farming experience category while 3.33 per cent of beneficiaries and 23.33 per cent non beneficiaries were from low farming experience category. In case of education, 35.00 per cent and 28.33 per cent of beneficiaries and non-beneficiaries were having education up to secondary level. Regarding land holding of the respondents, 28.33 per cent and 30.00 per cent of beneficiaries and non-beneficiaries were having 'semi-medium' land holding, while 26.66 per cent of beneficiaries and 20.00 per cent of non-beneficiaries were having 'small' land holding. Whereas 16.66 per cent of beneficiaries and 23.33 per cent of non-beneficiaries, 18.33 per cent of beneficiaries and 15.00 per cent of non-beneficiaries were having marginal land holding, while 10.00 per cent of beneficiaries and 11.66 per cent of non-beneficiaries were having 'big' land holding, whereas majority 68.33 per cent of beneficiaries and 65.00 per cent of non-beneficiaries had 'medium' annual income, whereas 15.00 per cent of beneficiaries and 30.00 per cent of non-beneficiaries had 'low annual income while, 16.66 per cent of beneficiaries and 05.00 per cent of beneficiaries had 'high' annual income.

Majority 65.00 per cent of beneficiaries and 61.66 per cent non-beneficiaries had 'medium' social participation, whereas 25.00 per cent of beneficiaries and 35.00 per cent of non-beneficiaries had 'low' social participation while, 10.00 per cent of beneficiaries and 03.33 per cent of non-beneficiaries had 'high' social participation, majority 73.33 per cent of beneficiaries and 71.66 per non-beneficiaries had 'medium' extension contact, whereas 11.66 per cent of beneficiaries and 21.66 per cent of non-beneficiaries had 'low' extension contact while, 15.00 per cent of beneficiaries and 06.66 per cent of non-beneficiaries had 'high 'extension contact, majority 61.66 per cent of beneficiaries and 58.33 per non-beneficiaries had 'medium' socio- economic status, whereas 25.00 per cent of beneficiaries and 30.00 per cent of non-beneficiaries had 'low' socio-economic status while, 13.33 per cent of beneficiaries and 11.66 per cent of non-beneficiaries had 'high' socio-economic status, 73.33 per cent of beneficiaries and 46.66 per non-beneficiaries had 'medium' market orientation, whereas 15.00 per cent of beneficiaries and 43.33 per cent of non-beneficiaries had 'low' market orientation while, 11.66 per cent of beneficiaries and 10.00 per cent of non- beneficiaries had 'high ' market orientation.

Majority 75.00 per cent of beneficiaries and 60.00 per non-beneficiaries had 'medium' risk orientation, whereas 15.00 per cent of beneficiaries and 35.00 per cent of non-beneficiaries had 'low' risk orientation while, 10.00 per cent of beneficiaries and 5.00 per cent of non- beneficiaries had 'high ' risk orientation, 65.00 per cent of beneficiaries and 63.33 per cent of non-beneficiaries had 'medium' cosmopoliteness, whereas 26.66 per cent of Beneficiaries and 28.33 per cent of non-beneficiaries had 'low' cosmopoliteness.

2. Impact of FLD of cotton production technology on beneficiaries of KVK.

Table 1 : Distribution of the respondents according to their practice wise knowledge about various components of improved practices of cotton cultivation by farmers.

Sr. No.	Improved Practices	Beneficiaries (N=60)		Non-Beneficiaries (N=60)	
		F	%	F	%
1.	Selection of soil	52	86.66	41	70.00
2.	Preparatory tillage	55	91.66	53	88.33
3.	Recommended dose of FYM	47	78.33	32	53.33
4.	Recommended varieties	56	93.33	40	66.66
5.	Time of sowing	45	75.00	33	55.00
6.	Method of sowing	50	83.33	40	66.66
7.	Spacing (150x30cm)	42	70.00	30	50.00
8.	Seed rate	38	63.33	30	50.00
9.	Recommended dose of NPK	39	65.00	28	46.66
10.	Hand weeding 2 to 3 times	54	90.00	48	80.00
11.	Hoeing 3 to 5 times	43	71.66	35	58.33
12.	Total no of irrigation	37	61.66	30	50.00
13.	Imp sucking pest of cotton	40	66.66	29	48.33
14	Use of magnesium sulphate and urea for control of reddening	43	71.66	24	40.00

The information about general impact of FLD on knowledge of the farmers was obtained and presented in Table 2 revealed that cent per cent of beneficiaries (93.33%) were having knowledge of recommended varieties, whereas it was 66.66 per cent among non-beneficiaries as per as preparatory tillage is concern 91.66 per cent of beneficiaries and 88.33 per cent non- beneficiaries were knowing about preparatory tillage. Upto 90.00 per cent beneficiaries and 80.00 per cent non-beneficiaries were well known about 2 to 3 hand weeding in cotton crop while, 86.00 per cent beneficiaries and 40.00 per cent non-beneficiaries were aware about the soil required for cotton crop.

Method of sowing of cotton was known by 83.33 per cent and 66.66 per cent beneficiaries and non-beneficiaries respectively. Required FYM for cotton crop was known by 78.33 per cent beneficiaries and 53.33 per cent non-beneficiaries. As per as sowing time was concern 75.00 per cent beneficiaries and 55.00 per cent non-beneficiaries were having knowing about the practice while,71.66 per cent beneficiaries and 58.00 per cent non-beneficiaries were knowing practice like number of hoeing required for cotton crop. Use of MgSo4 and urea was known by 71.00 per cent beneficiaries and 40.00 per cent non-beneficiaries respectively. Recommended spacing was known by 70.00 per cent beneficiaries and 50.00 per cent non-beneficiaries, 66.00 per cent beneficiaries and 48.00 per cent non-beneficiaries were known about sucking pest of cotton. While, 65.00 per cent beneficiaries and 46.00 per cent non-beneficiaries were well known about NPK required by cotton crop whereas, 63.33 per cent of beneficiaries and 50.00 per cent non-beneficiaries were having knowledge about correct seed rate and 61.66 per cent of beneficiaries and 50.00 per cent non-beneficiaries were having knowledge about total number of irrigation required by cotton crop respectively.

2. Overall impact of FLD on the knowledge about cotton cultivation on the beneficiaries of KVK.

It was observed from Table 3, that majority 76.66 per cent of beneficiaries and 51.66 per cent of non-beneficiaries had ‘medium’ impact of FLD on knowledge level, whereas 10.00 per cent of beneficiaries and 40.00 per cent of non-beneficiaries had ‘low’ impact of FLDs on knowledge while, 13.33 per cent of beneficiaries and 08.33 per cent of non- beneficiaries had ‘high’ impact of FLD on knowledge level about cotton production technology. However calculated ‘Z’ value shows that there was significant difference between beneficiaries and non-beneficiaries in respect to

impact of FLD on knowledge level about cotton production technology. There was significant difference between the knowledge of cotton production technology among the beneficiaries and non-beneficiaries was due to various training programmes organized by KVK scientists to KVK beneficiaries.

Table 2. Distribution of farmers according to their overall impact of knowledge on the front line demonstration of cotton on beneficiaries and non-beneficiaries

Sr. No.	Category	Beneficiaries (N=60)		Non-beneficiaries (N=60)		'Z' value
		F	%	F	%	
1.	Low (Up to 10)	06	10.00	24	40.00	**3.61****
2.	Medium (11 to 12)	46	76.66	31	51.66	
3.	High (13 and above)	08	13.33	05	08.33	
	Total	**60**	**100**	**60**	**100**	
	Mean	**11.20**		**10.09**		
	SD	**1.82**		**1.84**		

CONCLUSION

Majority of the beneficiaries and non-beneficiaries were from medium farming experience, having education up to secondary level, 'semi-medium' land holding, had 'medium' annual income, social participation, 'extension contact, socio-economic status, market orientation', risk orientation, and cosmopoliteness. Majority of the beneficiaries and non- beneficiaries had 'medium' impact of FLD on knowledge level about cotton production technology. There was significant difference between the knowledge of cotton production technology among the beneficiaries and non-beneficiaries was due to various training programmes and FLDs organized by KVK scientists to KVK beneficiaries.

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RESEARCH ARTICLE

Social Media: An Information Communication Tool for Empowering Farming Communities

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ABSTRACT

Social media are Internet sites where people interact freely, sharing and discussing information about each other and their lives, using a multimedia mix of personal words, pictures, videos and audio. Social media got a slow start in 1969 with the development of CompuServe, and took off in exponential growth in 1994 as personal computers became common and then in the 2000s as cell phones and mobile communication devices proliferated. Social media differs greatly from traditional media in many ways. Social media is accessed much more frequently than traditional methods. There is also an expectation from users that there are frequent updates and the ability to share with immediate results. Social media also reaches individuals and populations at a much faster rate than traditional methods. Internet users spend more time with social media sites than any other type of site. Social media is powerful tool for empowering rural communities past researches have shown that 42% of farmers who use Facebook and Twitter are using it every day. Whether sharing personal stories or using the sites as news sources, farmers are making their presence known online. YouTube is the most popular social media platform for agriculture professionals. Of the 51% of farmers that use the site, 60% seek out general news, 58% tune in for music, and 56% enjoy educational or how-to videos. Farmers are more likely to be found on social media in the early morning hours or in the evening. The area of rural development in India is as multi- faceted as the country itself and by and large media has affected almost every aspect of rural development. The paper extends the definition of social media networks from just being the social networking sites and micro blogging to other media networks like Community Radio, news channels and NGOs. Various success stories were collected and analyzed. The paper aims to discuss various fields where social media has affected rural people's lives, empowerment of rural communities and also of the fields where media has been lacking in its role.

Keywords: *Rural development, social media, Information, Empowerment*

METHODOLOGY

Present paper is written on the basis of past research studies. The focus has been made on numerous case studies from various fields where social media affects the lives of rural people. Data was collected from various sources, journals, research papers and also through number of discussions with people from the fields like journalism, social work etc. After closely examining the various case studies, the author has critically examined the social media networks' performance in rural India field wise. The study was based on various case studies and success stories so as to reaffirm the beliefs cited in the introduction section.

RESULTS AND DISCUSSION

Social media are media where information and content is generally created by users themselves using new technologies that allow easy use and access by powerful publishing technologies, publication and exchange. Social media are rich in the influence and interaction between peers and a public hearing which is increasingly intelligent and participative. The social media revolution is operating at several levels. It empowers farmers with knowledge. Farmers continuously need information about new seeds, pest attacks, weather and rainfall, machinery, plant protection and prices. This helps them choose the right crop, utilise resources efficiently, maximise yield and income. Present paper aim to discuss the impact of social media on rural communites.

Community Radio: A boon to rural farmers

Agriculture is one area in which Community Radio can be very useful. **Acharya (2009).** Agriculture has always been a highly knowledge-intensive sector requiring continuous information flow.

Farmers' quest for authentic, credible and usable information both from established systems and traditional practices is ever increasing in this fluctuating global environment, to operate efficiently and compete economically. The rapid changes happening around with WTO/globalization, uncontrolled urbanization, uncertainty in climate change, discerning consumer segment and continued farm crisis emphasize the importance of timely, appropriate and need based information and knowledge to meet myriad developmental challenges. Community Radio (CR) reaches out to various people simultaneously and in diverse locations such as farms, while fishing out in the sea, at local shops, public places, as long as radio is within the reception range. The end user just needs to have an FM radio to listen to the broadcast. Farmers and other representatives of the community can also participate in program production. CR can thus play an immense role as an information and communication technology for development (ICT4D), especially in rural India where other ICTs have limitations. **(Sharma, 2011).**

Facebook: Outstanding contribution in agriculture

Although many of the Indian villages are deprived of regular supply of electricity and the internet connectivity is still a farfetched dream for the masses but still there are success stories where Facebook, the famous social networking site has helped to make a difference in lives of rural people. **Rai and Shahila (2013).** It is true that there are very few computers in India's six lakh villages. Less than 0.5% of families have internet facility at home, says the National Sample Survey Organization report on expenditure in 2009-10. But that is no longer a barrier to internet access. With mobile phones in the pockets of four out of every 10 rural people, internet, Facebook and email are a push-button away. This has transformed the game. Farming has, as always, been a sociable sort of business. Farmers chat with other farmers to pick up cultivation tips and news about the outside world. Till now, the chats were face to face under the village banyan tree. Now, farmers are spreading the word, whether personal or business, through email, SMS, Facebook, Twitter, You Tube and blogs. And it is no teenage fad. Social Media has become Indian farm's latest survival tool. **Srinivas (2012).** As per a report in The Economic Times dated February 10, 2012, it saved many farmers of Maharashtra's Sangli district's farmers from perishing. Due to oversupply of turmeric, prices crashed exorbitantly in the local market. One of the local farmers used Facebook to connect to other turmeric farmers across the country and discussed the situation and discussed the prices with them. They decided not to participate in the local auction. Using social media, the news spread like a forest fire and 25000 turmeric farmers of Sangli heard of the boycott. The boycott served its purpose as the prices doubled. Earlier, a village sarpanch would sit under a tree and discuss certain issues with villagers before taking a final call. Facebook and Twitter are an extension of this concept. Farmer bodies are quick to point out the advantages of social media. Agropedia, spearheaded by IIT-Kanpur, is trying to create a kind of Facebook for agriculture where experts from across India can easily communicate with each other. Literate farmers are using Facebook to create a pan-India community of people growing the same crop, which can mobilise opinion and rapidly transmit information. It's a potent tool. Social media is helping farmers close the urban-rural divide. Farmers in organic, dairy, horticulture and floriculture have understood that they can customise their products better by using websites and blogs to connect with customers. Small tea growers in West Bengal are on Facebook and Twitter to interact with foreign buyers.

SMS based services for farmers

Reuters Market Light, and Iffco Kisan Sanchar, launched in some states in 2007 and 2008, are now becoming popular. Farmers pay to get customised SMSes and voice mails, several times daily, in the local language, which provide a variety of information throughout the cultivation cycle of their chosen crops, right up to mandi prices. Social media encourages smarter farming through opportunities to learn from agricultural experts, progressive farmers and the community's thought leaders. Avaaj Otalo, an on-demand information service launched by Standford University and IBM Research India in Gujarat, allows farmers to dial a phone number and listen to a voice message board, where they can post questions, listen to the questions and answers of other farmers, and post answers to the questions themselves.

Mobile based services for farmers

Social media is able to cross the hurdle of illiteracy that has left small and marginal farmers to the mercy of traders and middlemen. Services such as Digital Green, Spoken Web, Conspeakous VoiceGen and VoiKiosk are using audio and video

uploads to convey crop and market information. A mobile-based service, called Gappa Goshti, allows Maharashtra farmers to send audio and video messages without using the keypad. During a tour of Punjab, two users shared videos of paddy fields on the social network. The rest of the users in Maharashtra could see the fields without actually travelling to Punjab. Social media is allowing farmers to take charge of their lives. With this 'invisible technology' under the hood, people with no access to newspapers, TV or radios that broadcast in their native language, are becoming citizen reporters by using audio and video to record events in and around their fields, their villages and their community. Mobile news service CGnet Swara (Voice of Chhattisgarh), developed with the help of Microsoft Research India, is transforming how people in remote areas receive and share news. Word has spread that a quick cell phone call can lead to food deliveries for hungry children, government investigation of police brutality and medical help. The spread of mobile phones proves rural folk are ready to invest and adopt any new technology that can dramatically improve their lives. Social media gives the phone extra potency by empowering farmers with knowledge, encouraging precision agriculture and bridging the producer-customer and urban-rural divide. The digital revolution is promising millions of Indian farmers escape from poverty. And the chance to make new friends.

Positive Impact of social media on Agriculture:

In terms of any field Rural India could be a large market because approximately 750 million people live in 637,000 in Indian villages. Primarily the majority of rural population's livelihood depends on agriculture. So it is not wrong to say that even now India is an agriculture country. Given different topological conditions, farmers cultivate a wide range of crops in villages. Most of the farmers being illiterate face a lot of problems: right from the correct quality of seeds, insecticides, pesticides, new methods of cultivating etc. The success of agricultural development programs in developing countries largely depends on the nature and extent of use of mass media in mobilization of people for development. Many Indian social media networks have committed themselves to provide information to the farmers regarding cultivation as well as animal husbandry especially Community Radio which has been committed to rural audience for many years. Among the several mass media, newspaper and farm magazine are commonly used. They have a vital role to play in the communication of agricultural information among the literate farmers. Increasing rate of literacy in the country offers new promises and prospects for utilizing print medium as a means of mass communication. Agriculture journalism is a new field in India and is growing rapidly as the food giver of India is becoming literate now. As it has been seen by and large that Indian media has been unconcerned about the problems and hard realities of Indian farmer. A CMS (Center for Media Studies) media Lab study brings out that while 24 hour national news channels have by and large ignored reported farmers distress, coverage of national newspapers was disjointed of larger phenomena of rural indebtedness and Government policies. Farmers and agriculture related news constitute not even one percent of total news items of rational news channels despite the fact that agriculture constitutes 14.2 per cent of the GDP at constant 2004-2005 prices during 2010-2011 as per Central Statistics Office of India. Therefore, social media networks still have loads of opportunities to support Indian agriculture. Many farmers are already there. A recent study about how farmers use media found that 42 percent who use Facebook and Twitter are using it every day. Whether sharing photos and stories about how their farms are operated, making a personal connection with consumers or shedding light on important issues, farmers are starting to make their presence known online.

Mobile based system for rural health

Aside from the more common forms of social media such as Twitter and Facebook, there are numerous other forms of technology, that in conjunction with social media, are also changing the way individuals receive health messages and access healthcare. Mobile health technology (mHealth) uses text messages to support patients with chronic disease and help them with treatment compliance. mHealth is also used to engage individuals in behavior changes such as smoking cessation and healthy eating. mHealth allows for the quick and timely delivery of daily support at increased convenience and lower cost. eHealth equity use is another form of social media increasing at rapid rates, this includes the use of apps and podcasts to access and manage health information. This allows a patient to customize and learn about specific health interests

and concerns. Both mHealth and eHealth have been especially successful in reaching vulnerable populations who are not likely to access preventive care or manage chronic conditions on a regular basis. With the continued increase in the use of social media in public health, it is crucial to ensure that the public has the skill sets to use and access social media campaigns, this skill is known as eHealth Literacy and is defined as "the ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem.

Positive Impact of social media on health:

Rural development means as overall development of rural areas social, economic, political and cultural so that the people are to lead a pleasant life. Social media networks have played a pivotal role in improving the health of rural people and creating awareness among rural people. Public health professionals can use social media in their efforts to assess health needs, set policy, and communicate health concerns as they focus on protecting and improving the health of the community. It has been estimated that traditional health messaging campaigns reach less than 10 % of the targeted population. **Arora (2006).** The National Rural Health Mission has launched many campaigns. There are many advertisements by NRHM on right age of marriage, importance breast feeding, anganwadi programs, use of contraceptives, HIV AIDS. These advertisements directly appeal to village people as these are interactive and are in vernacular languages along with being in Hindi and English. Also, media has played a role of whistle blower in case of poor quality of mid day meals provided to children in rural schools. The major achievement of social media in this area will be the eradication of polio from India. There have been many strategies successfully implemented by India National Polio plus Society (INPPS) of Rotary International. The advertisements carried out on TV as well as radio with slogans like, *Do boond zindagi ki*' and bollywood celebrities appealing to all people to give polio drops to their children can be visualized of the main soldiers of this campaign. Also broadcast of spots on All India Radio and articles in national newspapers, especially in U.P. with polio messages of Muslim clerics, Maulanas, Maulvis and scholars. INPPS had arranged for media interviews with highly respected and eminent Muslim religious leaders and scholars to address the issue of polio menace in their community, during which they urged their communities to cooperate in polio eradication initiatives and requested the Ulemas (clerics) of respective regions to help the campaign by educating the community about polio and installing booths camps at Madarsas during NIDs/SNIDs. The articles based on these interviews were published in leading vernacular newspapers of U.P. India celebrated its first polio free year in 2012. Social media can prove to be of utmost importance in creating awareness in rural people about issues like sanitation, benefits of usage of LPG over cow dung cakes, drugs eradication etc. Media has covered miles in improving health of rural India and there are still many more miles to go. Google Trends is an example of social media surveillance outpacing traditional public health surveillance tools. A recent study has shown that Google trends predict influenza outbreaks days before traditional surveillance methods. By counting how many people are searching on Google for terms associated with the flu, public health officials can determine outbreak locations before the outbreaks occur. Similarly, placing links to web pages on printed media can help determine the effectiveness of traditional forms and expand the quantity of information available to the interested person. Quick Response Codes or QR Codes are an example of this.

Social media as an effective tool in politics:

Social media Whatsapp was the effective tool of the panchayat elections in Haryana which is turning out to be an effective tool to reach out the voters. Candidates contesting the election of zila parishad, block samiti and even sarpanch posts are using Facebook and WhatsApp as a platform to seek votes in the elections, which is considered as a popularity test for these leaders. Pictures and video clippings about the election campaign, including promises to the voters, are being shared on the Facebook accounts of candidates who are also inviting suggestions and issues of the people to woo voters. However, the lack of android mobile phones and high cost of internet packs remain major barriers for such a social media campaign in rural areas. "The candidates are making optimum use of WhatsApp. However, 50 per cent youths in the rural areas have Android phones and internet access. Personal and door to door contact, though, is still a more effective medium for elderly voters. **[Hindustantimes, 2015]**

NDTV-Toyota Greenathon- A campaign which light thousand of rural lives

NDTV-Toyota Greenathon was launched in April 2008 and it creates a nationwide awareness to save the environment. The GREENATHON is a fund raising event that brings in people to donate money to support TERI‟s initiative which aims at providing solar power to villages without electricity. In year 1, they raised funds to light up 56 villages and in Greenathon 2, the resulted in 115 villages being provided with solar power. The initiative is greatly supported by celebs like Priyanka Chopra, Shahrukh Khan and Katrina Kaif etc. As India played host to World Environment Day, the NDTV-Toyota Greenathon enthusiastically participated in the movement, by involving millions of people from across the globe in building an environment conscious society. In its third edition, the NDTV-Toyota Greenathon was bigger and greener as it expanded its reach internationally, with Greenathon hubs in Tokyo, Los Angeles, Toronto, London and Sydney. It received an overwhelming response and garnered support from all corners of the world, including the country's leading corporate houses, top Bollywood stars, musicians, environmentalists, NGOs and educational institutions.

Other positive impact of social media: [1] Increasing broadband penetration: The Government of India (GoI) has launched a INR 20,000 crore project to build National Optic Fibre Network (NOFN), also known as Bharat Broadband. This project is expected to connect 2,50,000 gram panchayats (covering more than 90%) and provide 'last mile' broadband connectivity to rural areas. [2] **Mobile devices:** Mobile devices (feature phones, smart phones & tablets) have emerged as the game changer in bringing Internet to rural areas. Availability of smartphones and tablets in the sub-INR 5000 will ensure widespread availability of devices that can connect to Internet. Low cost tablets provided to students will also drive usage. Aakash 3 is expected to have SIM card slot. In 2012, the number of mobile Internet users in rural areas grew 7.2 times. [3] **Mobile networks in rural areas:** The penetration will depend upon the capacity of the rural telecom networks to handle additional data demands created by new users. Telecom companies are slowly rolling out 3G and 4G services across country. The data plans offered should be affordable for people. The 2G data rates are already the lowest in world but do not provide high speeds and capacity. [4] **Visibility to conflicts and violence:** Issues related to land, environment, communal tensions, human rights violations, illegal mining and logging, which would take long time to reach traditional media (from far away regions) will now get more exposure. People can take pictures, videos and testimonies using cheap phones. They can quickly upload them online so that it gets quick coverage. They will also become more vocal against any law that is unpopular. As they discover newer interconnections, they will find it easier to mobilize, find common cause and disrupt traditional power balances. [5] **Creation of content in local language:** User generated content on social networks will solve the long-standing problem of unavailability of local language content on Internet. Users will create enormous amount of content through blogs, micro-blogs, social news and content sites like 9gag, Reddit and Delicious. [6] **Women empowerment:** Women, largely restricted to homes, are more likely to be exposed to this medium. They will use it for entertainment primarily and hopefully for education too. Usage patterns will differ from men. The medium provides a fertile ground for new struggles between genders, as men might try to control women's exposure to medium. [7] **Reduced violence**: Cheap hardware and connectivity will make it easier to record, document and publicize any violence. This will deter potential criminals and trouble mongers. But at the same time there are chances of violence fuelled by rumors as mentioned before. [8] **Greater voice in medium**: Currently, social media perceived weakly within mainstream politics. But if large numbers of rural populace embraces the medium, political parties will need effective social media strategies. They will have to guard themselves from potentially explosive false rumors and campaigns. [9] **Responsive Governance**: Social media will provide a platform to various govt. departments to directly interact with the masses. Delhi police has a Facebook page on which it provides regular updates useful to public. Local govt. officials on social platforms can set up similar pages to provide more responsive governance at a minimal cost. [10] **Ease of sharing content and commercializing creativity**: People can set up pages/profiles to display their creativity and commercialize it rather than setting up websites. **[Anonymous, 2012].**

Challenges of social media: The challenges themselves though have provided rural India with a very unique solution. Social media penetrated into rural areas in a different form through community radios like Mobile Vaani and Radio Dhadkan. Gram Vaani (meaning voice of the village), a social tech company based at IIT Delhi, has initiated an

interactive voice response (IVR) system called the Mobile Vaani for the rural community. This serves as their "social social media platform." This network enables rural households to create their own voice media that generates local action, greater awareness and empowerment for development. Sambhav, a voluntary nongovernmental organization, established a community radio station called Radio Dhadkan with a lot of support from UNICEF. It broadcasts content about education, health, livelihood and entertainment for mass education and awareness.

CONCLUSION

Social media networks have no doubt affected the lives of rural people. As far as agriculture is concerned, these have provided many opportunities to the farmers and eased the process of selling the crop through online schemes which has resulted in elimination of middlemen. There are innumerable success stories in field of health care as well. Rural politics is the area where social media networks haven't achieved to the required extent. As far as IT is concerned by making the resources like unregulated supply of electricity, subsidies in purchase of computers etc, available in villages, information centers can alleviate the asymmetry between urban and rural environments. In order to accelerate rural growth, it is essential that we learn new ways of integrating social and human infrastructure development into the installation of basic information and communications infrastructure. Also, it is true that if we want to penetrate the message of development among the rural masses we would have to opt for the folk forms of this country in more planned manner. Villagers comprise the core of Indian society and also represent the real India. And it is for these villagers that social media networks must realize their power as well as responsibility towards rural development. History has shown how nations have been built by social media. Now it's India's turn to grow with its 637,000 villages! Rural development will pave the path to India Vision 2020.

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RESEARCH ARTICLE

Knowledge and Adoption Behavior of Pigeon Pea Growers

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ABSTRACT

The study was conducted to know the extent of knowledge and adoption of recommended pigeon pea package of practices by the growers of Parbhani district in Maharashtra. The study was conducted in Parbhani district comprising 120 respondents from twelve villages. The result showed that maximum farmers possessed knowledge about intercultural operation, fertilizer dose, and irrigation while minimum farmers had knowledge about name and concentration of insecticide for control of pod borer, seed rate and seed treatment. The present study revealed that sowing time, intercultural operation were the practices fully adopted by most of the farmers but the plant protection measures, fertilizer dose were the practices partially adopted by more than half of the respondents. However it could further be seen that majority of respondents did not adopt seed treatment with rizhobium culture. Hence there is need to adopt the complete package of improved recommended practices of pigeon pea for reaching maximization in crop yield. This crop is widely grown in India but, the yield and productivity of pigeon pea is not satisfactory as compared to area under cultivation. The low productivity of pigeon pea may be due to non-adoption or poor adoption of production technology which may be due to low knowledge about recommended production technology. It was therefore, felt necessary to probe into the various dimensions particularly on knowledge and adoption of recommended package of practices of pigeon pea cultivation and to come with certain concrete findings. The present study was proposed to be undertaken with the following specific objectives. To study the extent of knowledge about recommended pigeon pea package of practices by the growers and to study the extent of adoption of recommended pigeon pea package of practices by the growers.

***Keywords**: Adoption, Knowledge, Package of practices*

METHODOLOGY

The present study was undertaken in Parbhani district of Maharashtra. Three talukas namely Manwat, Selu and Pathri from Parbhani district were randomly selected and from each talukas four villages were selected randomly. Ten farmers from each village who were cultivating this crop were selected randomly. Thus, the total numbers of respondents were one hundred and twenty. The data pertaining to the objectives of the study were collected with the help of structured interview schedule by personal interview method. The data thus collected were subjected to the statistical analysis by using, frequency and percentage. The extent of adoption was based on the weightage given to the recommended practices followed by respondents. If respondent adopts recommended practice fully two score was given, for partial adoption one score was given and for non-adoption zero score was given. Knowledge of respondents about recommended practices was measured by directly asking them questions about the advocated practices. In this, 31multiple choice questions were prepared in consultation with the scientists of MKV and literature available. The answers given by the respondents were marked in the questionnaire.

RESULTS AND DISCUSSION

The results of the present research work presented below.

Extent of knowledge of respondents about recommended package of practices of pigeon pea

Knowledge is an important variable which determine the use and application of agricultural technology. It was delighted to know from Table 1 that 83.33 per cent of respondents had knowledge about suitable soil for cultivation of pigeon pea crop, 79.16 per

cent of respondents had knowledge of ploughing and harrowing and 75.00 per cent of respondents had knowledge about requirement of FYM/ha for pigeon pea crop.

Table1. Knowledge of respondents about recommended package of practices of pigeon pea

Sr. No.	Recommended package of practices of pigeon pea	Knowledge level	
		Freq.	Per cent
A.	**Preparatory tillage**		
1.	Type of soil	100	83.33
2.	Ploughing and harrowing	95	79.16
3.	FYM requirement	90	75.00
B.	**Seed rate and seed treatment**		
1.	Seed rate	70	58.33
2.	Seed treatment with Rhizobium culture	65	54.16
3.	Quantity of Rhizobium culture	60	50.00
C.	**Sowing**		
1.	Sowing time	92	76.66
2.	Spacing	76	63.33
D.	**Fertilizer dose**	115	95.83
E.	**Intercultural operations**		
1.	Hoeing	119	99.16
2.	Weeding	119	99.16
F	**Plant protection measures**		
1.	Major pests and diseases of pigeon pea	99	82.50
2.	Use of wilt resistant varieties	72	60.00
3.	Name of insecticide for pod borer	74	61.66
4.	Concentration of monocrotophos	54	45.00
G	**Irrigations**	109	90.83
H	**Harvesting**		
1.	Proper stage of harvesting	110	91.66
2.	Sign of maturity of pigeon pea	103	85.83
I	**Yield/ha**	74	61.66

Regarding seed rate and seed treatments, it was observed that (58.33 per cent) respondents were having knowledge about seed rate. While, 54.16 per cent respondents had knowledge regarding seed treatment with rhizobium culture and 50.00 per cent of respondents were aware about quantity of rhizobium culture to be used. Above 99.16 per cent of respondents had knowledge about weeding and hoeing 76.66 per cent of respondents were having knowledge about time of sowing, While,63.33 per cent and 95.83 per cent of respondents had knowledge of spacing and fertilizer requirement of pigeon pea. It was clearly observed that 82.50 per cent of respondents were aware about major pests and diseases observed on pigeon pea crop. Whereas, 61.66 per cent of respondents had knowledge about particular insecticide for control of pod borer followed by 45.00 per cent of respondents had knowledge about concentration of monocrotophos to be used for control of pod borer. It was also noticed that 90.83 per cent of respondents were aware about irrigations to be required for pigeon pea crop. Whereas, 60.00 per cent of respondents were having knowledge of wilt resistant varieties. Further, it was noticed that 61.66 per cent of the respondents had knowledge about yield of pigeon pea per hectare. While 91.66 per cent and 85.83 per cent of respondents were aware about proper stage of harvesting and sign of maturity of pigeon pea crop.

Extent of adoption of recommended package of practices of pigeon pea by the respondents

Practice wise adoption index of recommended package of practices of pigeon pea by the respondents Adoption refers to both mental acceptance and also covers use of recommended package of practices of pigeon pea. The data revealed in Table 2 that 83.33 per cent of respondents had selected the recommended soil, whereas, 16.66 per cent of respondents did not select the soil for pigeon pea cultivation as per recommendation. While 79.16 per cent of respondents were following the ploughing and harrowing operations as per recommendations as against 20.83 per cent respondents who have not followed the same. As regards the application of FYM, data revealed that full adoption was done by only 42.50 per cent respondents and 32.50 per cent respondents applied FYM partially. While, 25.00 per cent respondents did not applied FYM to their crop. As far as use of seed, it was observed that

75.00 per cent respondents used recommended seed rate fully as against 25.00 per cent of respondents who have not adopted seed rate as per recommendation. It was noticed that only, 8.33 per cent of respondents partially adapted treatment of seed with Rhizobium culture and 75.00 per cent of respondents have not adopted seed treatment of Rhizobium culture for pigeon pea crop, respectively. As regards to sowing, 91.66 per cent respondents followed recommended sowing time and remaining 8.33 per cent do not sown their crop in recommended time, 59.16 per cent of respondents had fully adopted the recommended spacing as recommendation. About use of recommended fertilizer dose, 45.83 per cent respondents applied recommended dose, whereas 50.00 per cent respondents partially adopted the recommended dose of fertilizer and very negligible (4.16 per cent) respondents did not used any fertilizer dose for pigeon pea crop. In case of intercultural operations 77.50 per cent of the respondent fully adopted hoeing operation, whereas 21.66 per cent respondents partially adopted and 0.83 per cent respondents do not adopted hoeing operation as per recommended in pigeon pea cultivation. 86.66 per cent of the respondent fully adopted recommended weeding operation, whereas 12.50 per cent respondents partially adopted and 0.83 per cent respondents do not adopted weeding operation as per recommended in pigeon pea cultivation. Regarding plant protection measures it was observed that 25.00 per cent of respondents had fully adopted plant protection measures for cultivation of pigeon pea, whereas, 58.33 per cent respondents partially adopted plant protection measures, while 16.66 per cent of respondents do not use any kind of plant protection measures for cultivation of pigeon pea.

Table 2. Distribution of respondents according to their practice wise adoption of different package of practices of pigeon pea. (N=120)

Sr. No.	Package of practices of pigeon pea	Adoption					
		Full		Partial		No	
		Freq.	Per cent	Freq.	Per cent	Freq.	Per cent
I.	**Preparatory tillage**						
1.	Selection of soil (medium to heavy)	100	83.33	--	--	20	16.66
2.	One ploughing and two harrowing	95	79.16	--	--	25	20.83
3.	Recommended FYM	51	42.50	39	32.50	30	25.00
II.	**Seed and seed treatment**						
1.	Seed rate	90	75.00	--	--	30	25.00
2.	Seed treatment with Rhizobium culture	20	16.66	10	8.33	90	75.00
III.	**Sowing**						
1.	Recommended sowing time (15 June to 15 July)	110	91.66	--	--	10	8.33
2.	Spacing (60 x 30 cm)	71	59.16	29	24.16	20	16.66
IV.	**Fertilizer dose (25:50:25 NPK kg/ha)**	55	45.83	60	50.00	5	4.16
V.	**Intercultural operations**						
1.	3 hoeings	93	77.50	26	21.66	1	0.83
2.	2 weedings	104	86.66	15	12.50	1	0.83
VI.	**Plant protection measures**	30	25.00	70	58.33	20	16.66
VII	**Harvesting and threshing**						
1.	Time of harvesting	39	32.50	66	55.00	15	12.50
2.	Threshing with labour	30	25.00	--	--	90	75.00
3.	Threshing with machine	90	75.00	--	--	30	25.00

As regards harvesting it was clear from above table that only 32.50 per cent, 55.00 per cent and 12.50 per cent of respondents had fully adopted, partially adopted and not adopted the required days harvesting. Non availability and high wages for labour were the reasons responsible for 75.00 per cent of respondents not adopted and 25.00 fully adopted threshing with the help of labour. While, 25.00 per cent of respondents not adopted threshing with machine and 75.00 fully adopted threshing with the help of machine. Here it may be pointed out that it is no use to adopt some of improved practices only and neglecting some other one.

CONCLUSION

It may be concluded that the most of pigeon pea growers had knowledge about intercultural operation, fertilizer dose, harvesting, irrigation, etc. But only 45.00 per cent of respondents knew the concentration of insecticides for control of pod borer. Similarly, 58.33 per cent and 54.16 per cent of respondents were having knowledge of seed rate and seed treatment. It also revealed from the present study that most of the respondents fully adopted the recommended sowing time, intercultural operation, selection of soil, etc. The package of practices like plant protection measure, fertilizer dose was partially adopted. It was found that majority of respondent (75%) yet not adopts the seed treatment with rizobium culture which may be due to lack of knowledge. Hence, all the essential supplies and services for transfer of technology through extension activities should be made available to the farmers and intensive efforts by all concerned to convince the farmers about package of practices of pigeon pea are needed.

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RESEARCH ARTICLE

Vegetable and Fruit Growers Awareness about the Adverse Effects of Pesticides

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ABSTRACT

The present study was conducted in Pune district of Maharashtra state. Pune district was purposively selected for the study because it is having large area under vegetable and fruit cultivation. From Pune district Ambegaon, Junnar and Khed tahsils were selected on the basis of area under vegetable and fruit cultivation as the area of present research study. There were 13 villages from 3 tahsil selected. The findings of the study are based on the data collected by interviewing 115 selected vegetable and fruit growers. Out of 110 vegetable and fruit growers who used 'Fipronil', vast majority (80.00 per cent) were using it 'more than recommended dose', while in case of 'Dimethoate', majority (90.00 per cent) of the respondents were using 'more than recommended dose' and of those who were using 'Thiamethoxam', 52.00 per cent were using it 'as per recommended dose'. Majority (94.78 per cent) of the respondents were aware about adverse effects namely, 'Headache'(94.78 per cent), 'Irritation in eyes' (93.91 percent), 'Itching on skin'(90.43 per cent), 'Nausea' (84.35 per cent), 'pesticide causes death of valuable pollinators like honey bee' (72.17per cent), 'persistent chemicals contaminate soil for longer period'(59.13 per cent) and 'developed pesticide resistant in pest due to constant use' (53.91 per cent).

Keywords: *Awareness, Pesticides, Adverse effects*

The use of pesticides in India is increasing at the rate of 2.00 to 5.00 per cent per annum and is about 3.00 per cent of total pesticides used in world. About 90,000 metric tonnes of technical grade pesticides are currently produced and more than 67.00 per cent is used in agriculture sector alone (Nigam and Murthy, 2000). However, the consumption of pesticides in India is relatively less i.e. 0.400 kg /ha than in USA (3 kg/ha), Malaysia (9 kg/ha) or Japan (11 kg/ha). Among the various states, Uttar Pradesh is the largest consumer followed by Punjab, Haryana and Maharashtra. Regarding the pesticide share across agricultural crops, cotton account for 45%, followed by rice (25%), chillies/vegetables/fruits (13-24%), plantations (7-8%), cereals other than rice seeds (6-7%), sugarcane (2-3%) and other (1-2%) (Gupta, 2004; Abhilash and Singh, 2009). There are 400 insecticides in the schedule of Insecticide Act 1968 as against 129 at the time of enactment of the Act. Of these, 164 pesticides are registered so far, 78 products are being producedin India (Kulsheshta1992). With this background, the present study was conducted with following specific objectives. 1. To study the profile of the respondent farmer. 2. To study the awareness of respondent farmers about adverse effects of pesticides.

METHODOLOGY

The study was conducted in Pune district of Maharashtra. Considering the maximum area under vegetable and fruit cultivation, three tahsils *viz;* Khed, Ambegaon and Junnar were selected. From Ambegaon and Junnar tahsil, four villages were selected. Ten vegetable and fruit growers were selected randomly from each village from Ambegaon and Junnar tahsil and from Khed tahsil five villages were selected and seven vegetable and fruit growers were selected randomly from each village. In all, 115 farmers were selected. An interview schedule was specially designed in line with the objectives set forth to collect the needed information. The data were collected by personally interviewing the selected farmers.

RESULTS AND DISCUSSION

1. Profile of the vegetable and fruit **growers**

It was observed that majority (62.61 per cent) of the respondents was in the 'middle' age group and their average age was 46.00 years. As regards education, a maximum number (**60.87** per cent) of the respondents had completed 'Secondary' followed by 'College' education (**14.78** per cent). Amongst the respondents, 46.09 per cent and 35.65 per cent had 'marginal' and 'small' land holdings, respectively. The average land holding of the respondents was 1.75 ha. It is revealed that, majority number (62.61 per cent) of the respondents had 'medium' annual income. The average annual income of the respondents was Rs. 3.77 lakh. Regarding experience in vegetable and fruit cultivation, 61.74 per cent of the respondents had 'medium' experience in vegetable and fruit cultivation. On an average, the respondents had 19 years of experience in vegetable and fruit cultivation. With regards to area under vegetable and fruit, 53.91 per cent of the respondents were having 'low' area under vegetable and fruit cultivation with an average area of 1.5 ha. Maximum numbers of the respondents (68.70 per cent) were in the 'medium' category of extension contact. Majority of the respondents (59.13 per cent) were in the category of 'medium' **source of information**. Whereas, 74.78 per cent of the respondents had 'medium' risk preference and 71.30 per cent of the respondents in the 'medium' category of economic motivation.

Details of awareness of vegetable and fruit growers about adverse effects of pesticides

It was observed that majority (59.13 per cent) of the respondents were aware about adverse effects namely 'Persistent chemicals contaminate soil for longer period', followed by 'kills pest as well as small organism in soil' (37.39 per cent), and 'decrease in biodiversity of soil'(33.04 per cent). Large majority of the respondents were not aware about the adverse effect of pesticide 'decrease in water retention' (93.04 per cent). It was observed that, majority (72.17 per cent) of the respondents were aware about 'pesticide causes death of valuable pollinators like honey bee', followed by 'pest may become resistant to pesticide due to constant use year after year' (53.91 per cent). It was further observed that vast most (95.65 per cent) of the vegetable and fruit growers were not aware about fact that pesticide leads to 'reduction in reproduction capacity of animals', followed by 'water contamination leads to death of fishes and aquatic insects' (75.65 per cent), and 'grazing on contaminated grass leads to animals' poisoning' (68.70per cent). More than three-fifth (60.87 per cent) of the respondents were not aware about the adverse effect 'amphibians like frog leads to major damage'.

As regards to adverse effects of pesticides on human health, it was observed that majority of the respondents were aware of the adverse effects namely, 'irritation in eyes'(93.91 per cent) and 'itching on skin of workers' (90.43 per cent) during production , transport and use of pesticides. While, majority of the respondents were not aware about the fact that, pesticide poisoning leads to 'brain disorders' (92.17) per cent) and 'loss of appetite' (81.74 per cent) of workers during production, transport and use of pesticides. Majority (86.09 per cent) of the respondents were not aware about the adverse effect that 'children seem to be greatly susceptible to toxic effects of pesticides like leukaemia, brain cancer and birth defects'. Most (94.78 per cent) of the respondents were aware about eating of foods having chemical residues leads to 'headache', followed by 'nausea' (84.35 per cent), 'vomiting' (61.74 per cent) and 'fatigue'(59.13 per cent). Whereas, most (94.78 per cent) of the respondents were not aware about the adverse effect that eating of foods having chemical residues leads to 'loss of weight', followed by 'paralysis' (96.52 per cent), 'muscle pains' (91.30 per cent), 'blood disorders' (88.70 per cent) and 'breathing problems' (67.83 per cent). Majority (87.83 per cent) of the respondents were not aware about fact that 'constant contact of pregnant women with pesticides leads to disorders in new born or death', whereas, 79.13 per cent of the respondents were not aware about fact that, 'pesticides lead to danger of fire'.

Table 1: Distribution of respondents according to details of awareness of respondents about adverse effects of pesticides (n=115)

Sr. No.	Adverse effects of pesticides	Respondents	
		Yes (%)	No (%)
A.	**Soil and water pollution**		
1	Decrease in biodiversity of soil	38 (33.04)	77 (66.96)
2	Kills pests as well as small organisms in soil	43 (37.39)	72 (62.61)
3	Decrease in water retention	8 (6.96)	107 (93.04)
4	Persistent chemicals contaminate soil for longer period	68 (59.13)	47 (40.87)
B.	**Effects on living creatures**		
1	Death of valuable pollinators like honey bee	83 (72.17)	32 (27.83)
2	Developed pesticide resistance in pest due to constant use	62 (53.91)	53 (46.09)
3	Amphibians like frog leads to major damage	45 (39.13)	70 (60.87)
4	Water contamination leads to death of fishes and aquatic insects	28 (24.35)	87 (75.65)
5	Grazing on contaminated grass leads to animals poisoning	36 (31.30)	79 (68.70)
6	Reduction in reproduction capacity of animals	5 (4.35)	110 (95.65)
C.	**Effects on human health**		
1.	Adverse effects on workers during production, transport and use, as follow		
a.	Irritation in eyes	108 (93.91)	7 (6.09)
b.	Itching on skin	104 (90.43)	11 (9.57)
c.	Brain disorders	9 (7.83)	106 (92.17)
d.	Loss of appetite	21 (18.26)	94 (81.74)
2.	Children seem to be greatly susceptible to toxic effects of pesticides like leukemia, brain cancer and birth defects	16 (13.91)	99 (86.09)
3.	Eating of foods having chemical residues leads to		
	Fatigue	68 (59.13)	47 (40.87)
	Headache	109 (94.78)	6 (5.22)
	Nausea	97 (84.35)	18 (15.65)
	Vomiting	71 (61.74)	44 (38.26)
	Breathing problems	37 (32.17)	78 (67.83)
	Blood disorders	13 (11.30)	102 (88.70)
	Loss of weight	6 (5.22)	109 (94.78)
	Muscle pains	10 (8.70)	105 (91.30)
	Paralysis	4 (3.48)	111 (96.52)
4.	Constant contact of pregnant women with pesticides leads to death or disorders in new born.	14 (12.17)	101 (87.83)

Awareness of vegetable and fruit growers about adverse effects of pesticides

It is observed that, majority (61.74 per cent) of the respondents had 'medium' awareness about adverse effects of pesticides, while remaining 20.00 per cent and 18.26 per cent of the respondents had 'low' and 'high' awareness, respectively. On an average, awareness of the respondents had 17 score.

CONCLUSION

Majority of the vegetable and fruit growers belonged to the middle age group most of them had received secondary education, having marginal land holding and followed by small, medium income group, medium experience in vegetable and fruit cultivation, had medium extension contact, medium **Source of information**, medium risk orientation, with medium economic motivation. Majority of vegetable and fruit growers possessed medium awareness about adverse effect of pesticides.

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RESEARCH ARTICLE

Measurement and Content Analysis on Attitude of Women towards Self Help Groups in Andhra Pradesh

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ABSTRACT

Women's participation in Self Help Groups have obviously created tremendous impact upon the life pattern and style of poor women and have empowered them at various levels not only as individuals but also as members of the family members of the community and the society as whole. SHG is a more attractive scheme with less effort. Self help groups are necessary to overcome exploitation, create confidence for the economic self-reliance of rural people, particularly among women who are mostly invisible in the social structure. These groups enable them to come together for common objective and gain strength from each other to deal with exploitation, which they are facing in several forms. Hence it is a need for hour to know their attitude towards this self employment program which would be helpful for the government to know the pros and cons of the program. So the study was undertaken in three districts of Andhra Pradesh on attitude of women members towards self help groups.Considering the growing significance of self-help groups for women empowerment, the study attitude of rural women through self-help group was conducted in three districts of Andhra Pradesh. The sample consisted of 240 women members of SHGs from 12 villages who were selected randomly based on a criteria that a group which was working for more than five years. The research revealed that majority (91.66%) of the members strongly agree that Decreases ill effects of borrowing from money lenders followed by SHGs promotes women members to meet their day-to-day family expenses (87.50%) and SHGs include members from the same family for easy management of groups (83.33%) with regard to strongly agree. With respect to agree majority (75%) of the women members agreed that SHGs serve as medium of delivering micro credit to the members and SHGs serve as an alternative instrument of financial intermediation for the poor (64.29%). With regard to disagree statements majority (59.17%) of the members expressed that SHG promotes conflicts among the members and in case of undecided statements majority (33.33%) were expressed that Women are capable of exerting influence on their husbands was mostly undecided. With respect to attitude a scale was developed to measure the attitude of rural women towards self-help groups by using summated rated scale method. The results of the study revealed that majority (55.83%) of the women members were having medium level of attitude

***Key words**: SHGs, Attitude and Content Analysis*

METHODOLOGY

The study was conducted by using ex-post facto research design. The state, Andhra Pradesh was selected purposively as the researcher belonged to this state and well acquainted with the regional language i.e., Telugu which would help to build a good rapport and also facilitates for indepth study through personal observation and interview. One district had been selected from each region of Andhra Pradesh based on highest number of self help groups i.e. East Godavari from coastal, Chitoor from Rayalaseema and Nalgonda from Telagana region. Two mandals had been selected from each district based on highest number of SHGs. From East Godavari Rajahmundry and Kakinada, Thirupati and Madanapallemandals representing Chitoor region and Meriyalaguda and Naredcharala representing Nalgonda region. From the selected mandals two villages been selected randomly using random table method. Accordingly, twelve villages were selected. From Rajahmundry Mandal Chechucolony and Dawaleshwaram were selected randomly. From Kakinada Mandal S Achutapuram and Sarpavaram villages were selected. From Meriyalaguda Mandal Badhlipuram and Alagadappa villages were selected. From Naredcharalamandal Kadulavarigudem and

Nandipadu villages were selected. From Thirupati Mandal Padepeta and Peruru villages were selected. From Madanapalle Mandal Raygantipalli and Nalamvadlapalli villages were selected. From the selected villages two women SHGs from each village have been selected based on a criteria i.e the Self Help Groups, which have been functioning for more than five years. Accordingly, twelve villages and twenty four self help groups were selected. So total of 240 sample size had been included in the study. The scale was constructed by following 'Summated Rating or Likert Rating' scaling technique developed by Edwards (1969). Possible statements concerning the psychological object i.e. 'self-help groups' based on review of literature, discussion with scientists and extensionists were collected. Totally fifty six statements were collected which were organized and structured in the form of items. The items were screened and edited by following the informal criteria suggested by Edwards (1969) in the construction of the attitude scale. Based on the screening, forty six items were finally selected which formed the universe of contents. The 46 selected statements were then subjected to judge's opinion on a five-point continuum ranging from most relevant to least relevant. The list of statements was then sent to 70 judges that comprised of scientists of State Agricultural Colleges, Extension Education Institute (Hyderabad), National Institute of Rural Development, MANAGE and others. Out of 70 judges, 60 judges responded by sending their judgements. By applying the formula, the scale values i.e. t-values were computed for 46 statements. After computing the't' value for all the statements comprising of thirty three positive and eleven negative statements with t value equal to or greater than 1.75 were finally selected and included in the scale developed to measure the attitude of women towards Self Help Groups. There were 44 statements in the final scale developed. Reliability and validity were also calculated then subjected to content analysis. It was used to determine the relative emphasis or frequency of various communication phenomena.

Reliability of the scale

The reliability of the scale was determined by 'split-half' method (Garrett and Woodworth, 1973). The forty four selected attitude items were divided into two equal halves by odd-even method (Singh, 2008). The two halves were administered separately to 50 self-help group women in a non-sample area. The score for each respondent were recorded separately for even and odd questions based on five point continuum i.e. 5,4,3,2 and 1 for positive statement and vice-verse for negative statement. Then scores were summed to get the total score of each respondent. The scores were subjected to Pearson product-moment correlation coefficient (r) between the respondents scores on the even-numbered items and their scores on the odd-numbered items. The resulting coefficient is an estimate of the half-test reliability i.e., the reliability of the odd-numbered items, or the even-numbered items, but not both combined. The value of r is 0.69. So, further the reliability coefficient of the whole test was computed using the Spearman-Brown prophecy formula because only half the number of items is used so the reliability coefficient is reduced so in order to get a better estimate of the reliability of the full test we apply this correction.

The formula of Spearman-Brown correction is:

$$\rho = \frac{2 \times r\,half - test}{1 + r\,half - test}$$

The whole test reliability (rtt) was 0.82. According to Singh (2008), when the mean scores of the two groups are of narrow range, a reliability coefficient of 0.50 or 0.60 would suffice. Hence, the constructed scale is reliable as the rtt was greater than 0.60.

Content validity of the scale

It referred to the representativeness or sampling adequacy of the content of a measuring instrument (Kerlinger, 2007). Content validation was carried out by subjecting the selected attitude items to judge's opinion. Experts in the selected field of study were the judges. They were asked to indicate the extent to which each attitude item covered the different aspects of women attitude towards self help groups or judge each item for its presumed relevance to the property being measured. The responses were obtained on a four-point continuum of 'most relevantly covers', 'more relevantly covers', 'less relevantly covers' and 'least relevantly covers'. Scores of 4, 3, 2 and 1 were given for the points on the continuum respectively. Totally 60 judges responded by sending their judgements. The content validity of the scale of the

mean score was fixed by calculating the total score continuum divided by number of point continuum categories. The value obtained was 3.86 so if the overall mean score of the attitude items as rated by the judges was above 2.5, the scale will be declared as valid and if not otherwise. In the present case, the overall mean score was worked out as 3.86 (most relevantly covers and more 'relevantly 'covers) therefore, the constructed attitude scale is said to be valid.

Administration of the scale

The forty four items selected were arranged randomly in order to avoid biased responses. A five-point continuum of 'strongly agree', 'agree', 'undecided' 'disagree' and 'strongly disagree' was used as response categories. The scoring procedure adopted is as follows. This scale was administered to obtain SHG women's responses. The score obtained for each statement was summed up to arrive at the attitude score for that respondent. The score ranged from 220 (maximum) to 44 (minimum). The responses were grouped as less favourable, moderately favourable and highly favourable based on the mean and standard deviation.

Nature of the statement	Continuum				
	Strongly Agree	Agree	Un decided	Dis agree	Strongly Disagree
Positive	5	4	3	2	1
Negative	1	2	3	4	5

The primary data were collected using a pre-tested structured interview schedule by conducting personal interview. Data was tabulated, classifieds and analyzed using frequency percentage.

RESULTS AND DISCUSSION

Data on content analysis of attitude statements of women towards self help groups were furnished accordingly on the nature and magnitude of the attitude statements in Table statement wise responses as shown in the table are discussed below:

Table: 1. Content Analysis on Attitude of Women towards Self Help Groups

Sr. No	Statements	Response Category									
		SA		A		UD		DA		SDA	
		F	%	F	%	F	%	F	%	F	%
1	SHGs promotes Better work environment	187	77.92	46	19.17	7	2.92	0	0	0	0
2	SHG works as a powerful tool for socio-economic empowerment of women	117	48.75	121	50.42	2	0.83	0	0	0	0
3	SHGs promotes savings among the members	76	31.67	140	58.33	24	10	0	0	0	0
4*	SHG promotes conflicts among the members	19	7.92	28	11.67	36	15.00	142	59.17	15	6.25
5	SHGs improves self confidence level to talk within family	95	39.58	121	50.42	14	5.83	10	4.17	0	0
6	SHGs improves standard of living	165	68.75	66	27.50	5	2.08	2	0.83	2	0.83
7	SHGs helps in gaining respect in family	137	57.08	97	40.42	6	2.50	0	0	0	0
8	Increases participation in household decision making	80	33.33	142	59.17	13	5.42	5	2.08	0	0
9	SHG formation can be a way to eradicate the poverty and unemployment	58	24.17	139	57.92	36	15.00	7	2.92	0	0
10	SHGs facilitates the formation of social capital	94	39.17	101	55.42	11	4.58	2	0.83	0	0
11	SHGs serve as medium of delivering micro credit to the members	60	25	180	75	0	0	0	0	0	0
12	SHGs improves the saving behaviour of women	137	57.08	101	42.08	2	0.83	0	0	0	0
13	It creates self image in the family and community	99	41.25	119	49.58	22	9.17	0	0	0	0

14*	It is very difficult to promote skills for income generation activities	22	9.17	27	11.25	24	10.00	101	42.08	66	27.50
15	SHGs inculcates good Leadership qualities	80	33.33	104	43.33	45	18.75	11	18.75	0	4.58
16	Improvement in the literacy level	77	32.08	77	32.08	66	27.50	14	5.83	6	2.50
17	It improves social status in the society	91	37.92	120	50.00	29	12.08	0	0	0	0
18	Women have freedom of mobility	28	11.67	119	49.58	69	28.75	24	10	0	0
19	Women are capable of exerting influence on their husbands	44	18.33	52	21.67	80	33.33	60	25.00	4	1.67
20	SHGs promotes a change in the consumption pattern	101	42.08	120	50.00	17	7.08	2	0.83	0	0
21	SHGs helps in the creation of assets	83	34.58	59	24.58	41	17.08	51	21.25	6	2.50
22	SHG promotes women members to meet their day-to day family expenses.	210	87.50	30	12.5	0	0	0	0	0	0
23	SHGs helps to improve their communication skills	165	68.75	61	25.42	14	5.83	0	0	0	0
24*	It is very difficult to promote coordination among members.	3	1.25	4	1.67	12	5.00	64	26.67	157	65.42
25	Problem solving ability increased among the members	110	45.83	109	45.42	13	5.42	8	3.33	0	0
26	Knowledge level of members increased	66	27.50	78	32.50	9	35.83	8	3.33	2	0.83
27	Decreases ill effects of borrowing from money lenders	220	91.66	10	4.17	5	2.08	4	1.67	1	0.42
28	Acquaintance with the banking operations	111	46.25	129	53.75	0	0	0	0	0	0
29	Meetings of SHGs promotes better exposure	64	26.67	118	49.17	35	14.58	23	9.58	0	0
30	Entrepreneurial activities promotes risk bearing capacity	95	39.58	89	37.08	47	19.58	9	3.75	0	0
31*	SHGs are not always catering to the needs of all their members.	16	6.67	14	5.83	19	9.17	169	70.42	22	9.17
32*	Members of self help groups are irregular in payments	11	4.58	9	3.75	19	7.92	131	54.58	70	29.17
33	SHG membership can contribute to women's election to panchayati raj	74	29.17	47	19.58	20	8.33	72	30	27	11.25
34	Women members can better utilize their spare time in productive activities through groups	58	24.17	50	20.83	47	19.58	57	23.75	28	11.67
35*	Members of self help groups are irregular in savings	3	1.25	12	5.00	14	5.83	126	52.50	85	35.42
36	SHGs helps in developing good entrepreneurs	92	38.33	100	41.67	22	9.17	21	8.75	5	2.08
37*	There is no cooperation among the women members	7	2.92	20	8.33	46	19.17	142	59.17	25	10.42
38*	SHGs include members from the same family for easy management of groups.	200	83.33	20	8.33	3	1.25	15	6.25	2	0.83
39	SHGs create awareness among members on the social evils	124	51.67	81	33.75	16	6.67	18	7.50	1	0.42
40	SHGs serve as an alternative instrument of financial intermediation for the poor.	61	25.63	153	64.29	21	8.82	3	1.26	0	0.00
41	SHGs promotes change in the attitude of men towards women	81	33.75	82	34.17	64	26.67	12	5.00	1	0.42
42*	SHGs unable to solve all the problems of the group	4	1.67	39	16.25	77	32.08	107	44.58	13	5.42
43*	Rural women were generally found to be least participative in social programmes	1	0.42	4	1.67	51	21.25	160	66.67	24	10.00

***(Negative Statements)**

From the table 1. it was observed that majority of the members strongly agree that Decreases ill effects of borrowing from money lenders 91.66 per cent, remaining 4.17 per cent, 2.08 per cent, 1.67 per cent and 0.42 per cent agree, undecided, disagree and strongly disagree respectively. The other statements which the members strongly agree majorly were SHGs promotes women members to meet their day-to-day family expenses (87.50%), SHGs include members from the same family for easy management of groups (83.33%), SHGs promotes Better work environment(77.92%) improves standard of living (68.75%), SHGs helps to improve their communication skills (68.75%), SHGs create awareness among members on the social evils (51.67%).SHGs helps in gaining respect in family (57.08%), SHGs improves the saving behaviour of women (57.08%), Problem solving ability increased among the members (45.83%), SHGs helps in the creation of assets (34.58%), Improvement in the literacy level (32.08%), SHGs membership can contribute to women's election to panchayati raj (29.17%), SHGs serve as medium of delivering micro credit to the members (25%), Women members can better utilize their spare time in productive activities through groups (24.17%).

It was found that the statements which were majorly agreed by majority of the members are SHGs serve as medium of delivering micro credit to the members (75%), SHGs serve as an alternative instrument of financial intermediation for the poor (64.29%), Increases participation in household decision making (59.17%), SHGs promotes savings among the members (58.33%), SHGs formation can be a way to eradicate the poverty and unemployment (57.92%), SHGs facilitates the formation of social capital (55.42%), Acquaintance with the banking operations (53.75%), SHG works as a powerful tool for socio-economic empowerment of women (50.42%), SHGs improves self confidence level to talk within family (50.42%), It improves social status in the society (50.00%), SHGs promotes a change in the consumption pattern (50.00%), Women have freedom of mobility (49.58%), Meetings of SHGs promotes better exposure (49.17%), It creates self image in the family and community (41.25%), SHGs inculcates good Leadership qualities (43.33%), SHGs helps in developing good entrepreneurs (41.67%), SHGs promotes change in the attitude of men towards women (34.17%), Knowledge level of members increased (32.50%) and Decreases ill effects of borrowing from money lenders (4.17%).

From the perusal of the table 1, it was clearly observed that the statements like SHG promotes conflicts among the members were mostly disagreed (59.17%) followed by undecided (15.00%) and strongly disagreed (6.25%), It is very difficult to promote skills for income generation activities was mostly disagreed (42.08%) followed by strongly disagreed (27.50%) and undecided (10.00%), Women are capable of exerting influence on their husbands was mostly undecided (33.33%) followed by disagree (25.00%) and strongly disagreed (1.67%), SHGs helps to improve their communication skills was mostly agree (25.42%) and (5.83%) are undecided. It was very difficult to promote coordination among members was mostly strongly disagreed (65.42%) followed by disagreed (26.67%) and undecided (5.00%), SHGs are not always catering to the needs of all their members was mostly disagreed (70.42%) followed by strongly disagreed (9.17%) and undecided (9.17%), SHGs promotes Better work environment was mostly agree (19.17%) and undecided (2.92%), Members of self help groups are irregular in payments was mostly disagreed (54.58%) followed by strongly disagreed (29.17%) and undecided (7.92%), Members of self help groups are irregular in savings was mostly disagreed (52.50%) followed by strongly disagreed (35.42%) and undecided (5.83%), There is no cooperation among the women members was mostly disagreed (59.17%) followed by undecided (19.17%) and strongly disagreed (10.42%), SHGs unable to solve all the problems of the group was mostly disagreed (44.58%) followed by undecided (32.08%) and strongly disagreed (5.42%), Rural women were generally found to be least participative in social programmes was mostly disagreed (66.67%) followed by undecided (21.25%) and strongly disagreed (10.00%) and Low levels of motivation and family support was mostly disagreed by 52.92 per cent, the remaining 35.00 and 10.42 per cents were strongly disagreed and undecided respectively.

Table 2: Distribution of SHG members based on Attitude

Sr. No.	Category	Number	Per cent
1.	Less favourable	34	14.17
2.	Moderately	134	55.83
3.	favourable	72	30.00
	Highly favourable	**240**	**100.00**
	Total		
Mean = 187.54		S.D. = 21.04	

It could be seen from the Table 2 that among the total respondents, majority (55.83%) were found to possess moderately favourable attitude towards self-help groups while (30%) of the respondents had highly favourable attitude towards self -help groups. Less favourable attitudinal pattern has been observed with only (14.17%) of the members.

CONCLUSION

The attitude of women towards SHGs was very much positive in most of the statements and also there was a change in their lives and improved their standard of living. Most of them were saved from the hands of money lenders who charged high rates of interest for their barrowings. Due to participation in SHG the major changes that was observed was improvement in their communications skills, leadership qualities, saving behaviour, self confidence level and social status. Hence, the government agencies and private organizations should give due importance to SHG's, enroll more number of members and enhance activities of SHG's specially for women empowerment purpose.

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RESEARCH ARTICLE

Knowledge and Adoption of Bio-Fertilizers among the Farmers

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ABSTRACT

The present study was conducted in Kolhapur district of Maharashtra. Data were collected personally from 120 farmers from ten villages of Karveer, Kagal, and Hatkanagale tahsils to study the knowledge and adoption of bio fertilizers among the farmers. The findings of the research revealed that Majority (68.33 per cent) of the respondents had medium level knowledge, followed by 20.00 per cent of them having low level of knowledge and 11.67 per cent of the respondents had high level of knowledge. Majority (64.17 per cent) of the respondents had medium adoption level, followed by 20.00 per cent of them having low adoption level and 15.83 per cent of the respondents had high adoption level of bio fertilizers. More than half (52.50 per cent) farmers reported low shelf life of bio fertilizers, 42.50 per cent farmers reported non availability of bio fertilizers locally at times when needed, 35.00 per cent farmers reported lack of knowledge about bio fertilizers practices and 29.17 per cent farmers reported lack of knowledge about bio fertilizers as the constraints. More than half (52.50 per cent) of the farmers suggested to increase the shelf life of bio fertilizers, 46.67 per cent of the farmers suggested that bio fertilizers should be available at local level, 43.33 per cent of the farmers suggested to provide useful information and literature on bio fertilizers from Agriculture Department and University, 33.33 per cent of the farmers suggested to conduct the demonstrations regarding use of bio fertilizers.

Keywords: *Knowledge, Adoption, Bio fertilizers*

METHODOLOGY

In Kolhapur district, total consumption of bio-fertilizers during 2013-14 was 20640 kg. Maximum consumption of bio fertilizers was in Hatkanagale, Karveer and Kagal tahsils (3988, 3444 and 2944 kg., respectively) as per the report of Maharashtra Agriculture Industrial Development Corporation, Kolhapur (2013-14). The present study was conducted in three tahsils of Kolhapur District namely Karveer, Kagal and Hatkanagale selected on the basis of maximum use of bio fertilizers. From each of selected tahsils, four villages were randomly selected from the list of villages covered in the use of bio fertilizers. From each selected village, 10 farmers were selected randomly and treated as respondents for present study. Hence, collectively 120 respondents were selected for the study.

RESULTS AND DISCUSSION

1. Knowledge and adoption of the farmers about bio-fertilizers

Table 1. Classification of the respondents according to their overall knowledge

Sl. No.	Category (Score)	Respondents (n=120)	
		Number	Per cent
1.	**Low level** (Up to 20)	24	20.00
2.	**Medium level** (Between 21 to 66)	82	68.33
3.	**High level** (67 and above)	14	11.67
	Total	**120**	**100.00**

It was observed from Table 1 that majority (68.33 per cent) of the respondents had medium level knowledge, followed by 20.00 per cent of them having low level knowledge and 11.67 per cent of the respondents had high level knowledge.

Table 2. Classification of the respondents according to their knowledge and adoption about bio fertilizers

Sl. No	Particulars		Knowledge (N=120		Adoption (n=120)		
			Yes	No	Complete	Partial	No
1.	Types of Bio fertilizers.	1. Rhizobium	94 (78.33)	26 (21.66)	69 (57.50)	24 (20.00)	27 (22.50)
		2. Azotobacter	61 (50.83)	59 (49.17)	33 (27.50)	25 (20.83)	62 (51.67)
		3. P.S.B.	97 (80.83)	23 (19.17)	75 (62.50)	20 (16.66)	25 (20.84)
		4. Azospirillum	31 (25.83)	89 (74.17)	17 (14.17)	10 (8.33)	93 (77.50)
		5. Acetobacter	78 (65.00)	42 (35.00)	55 (45.83)	21 (17.50)	44 (36.67)
2.	Forms of Bio fertilizers.	1. Liquid	89 (74.17)	31 (25.83)	50 (41.67)	39 (32.50)	31 (25.83)
		2. Powder	97 (80.83)	23 (19.17)	74 (61.67)	22 18.33)	24 (20.00)
3.	Sources of Bio fertilizers Availability	1. Agriculture University	41 (34.17)	79 (65.83)	03 (2.50)	01 (0.83)	116 (96.67)
		2. Agriculture College	96 (80.00)	24 (20.00)	57 (47.50)	37 (30.83)	26 (21.67)
		3. Agriculture department	43 (35.83)	77 (64.17)	01 (0.83)	30 (25.00)	89 (74.17)
		4. Agro service centre	95 (79.17)	25 (20.83)	59 (49.17)	36 (30.00)	25 (20.83)
		5. Krishi Vigyan Kendra	6 (5.00)	114 (95.00)	00 (00)	00 (00)	120 (100.0)
4.	Methods of Bio fertilizers application	1. Seed treatment	97 (80.83)	23 (19.17)	82 (68.33)	13 (10.83)	25 (20.84)
		2. Seedling dipping	72 (60.00)	48 (40.00)	03 (2.50)	33 (27.50)	84 (70.00)
		3. Soil application	79 (65.83)	41 (34.17)	05 (4.17)	45 (37.50)	70 (58.33)
		4. Application through water	95 (79.17)	25 (20.83)	73 (60.83)	15 (12.50)	32 (26.67)
5.	Time of application	1. Before sowing	97 (80.83)	23 (19.17)	86 (71.67)	09 (7.50)	25 (20.83)
		2. After sowing	95 (79.17)	25 (20.83)	69 (57.50)	27 (22.50)	24 (20.00)
6.	Dose of Bio fertilizers application	1. Seed treatment: 25gm./kg seed	98 (81.67)	22 (18.33)	83 (69.17)	13 (10.83)	24 (20.00)
		2. Seedling dipping: 10 gm./lit.	75 (62.50)	45 (37.50)	01 (0.83)	34 (28.33)	85 (70.84)
		3. Through water (Drip) 2 lit./Acre.	97 (80.83)	23 (19.17)	81 (67.50)	15 (12.50)	24 (20.00)
		4. Soil application: 2 kg. in 50 kg. FYM mixture.	81 (67.50)	39 (32.50)	04 (3.33)	44 (36.67)	72 (60.00)
7.	Keep away bio fertilizers from heat and sunlight.		98 (81.67)	22 (18.33)	86 (71.67)	12 (10.00)	22 (18.33)
8.	Do not mix Bio fertilizers with pesticides and fungicides.		98 (81.67)	22 (18.33)	84 (70.00)	14 (11.67)	22 (18.33)
9.	Adequate soil moisture at the time of application of bio fertilizers.		98 (81.67)	22 (18.33)	81 (67.50)	17 (14.17)	22 (18.33)
10	Use of Bio fertilizers before expiry date.		99 (82.50)	21 (17.50	84 (70.00)	14 (11.67)	22 (18.33)
11	Treated seed sown after shade drying.		99 (82.50)	21 (17.50	72 (60.00)	23 (19.17)	25 (20.83)

Knowledge about types of bio fertilizers- It is concluded from Table 2 that majority of the respondents had knowledge on type of bio fertilizer used PSB (80.83 per cent), Rhizobium (78.33 per cent), Acetobacter (65.00 per cent), Azotobacter (50.83 per cent) and Azospirillum (25.83 per cent), respectively.

Knowledge about forms of bio fertilizers- Majority (74.17 per cent) of the respondents had knowledge about liquid forms of bio fertilizers and 80.83 per cent of the respondents had knowledge about powder form of bio fertilizers.

Knowledge about sources of bio fertilizers availability- It is observed from Table 2 that majority of the respondents had knowledge about sources of bio fertilizers availability are Agriculture College (80.00 per cent), Agro Service Centre (79.17 per cent), Agriculture Department (35.83 per cent), Agriculture University (34.17 per cent), and Krishi Vigyan Kendra (5.00 per cent), respectively.

Knowledge about methods of bio fertilizers application- It is observed from Table 2 that majority of the respondents had knowledge about methods of bio fertilizer application namely seed treatment (80.83 per cent), application through water (79.17 per cent), soil application (65.83 per cent) and seedling dipping (60.00 per cent), respectively.

Knowledge about time of bio fertilizers application- Majority (80.83 per cent) of the respondents had knowledge about before sowing and 79.17 per cent of the respondents had knowledge after sowing application of bio fertilizers.

Knowledge about dose of bio fertilizers application- Majority (81.67 per cent) of the respondents had knowledge about dose of seed treatment and 80.83 per cent had knowledge about dose of bio fertilizers application through irrigation water, while more than two third (67.50 per cent) had knowledge about dose of soil application with FYM and less than two third (62.50 per cent) of the respondents had knowledge about dose of bio fertilizers through seedling dipping.

Knowledge about care and management of bio fertilizers- Majority (81.67 per cent) of the respondents had knowledge about keeping away bio fertilizers from heat and sunlight, not mixing of bio fertilizers with pesticides and fungicides and having adequate soil moisture at the time of application of bio fertilizers. Majority (82.50 per cent) of the respondents had knowledge about use of Bio fertilizers before expiry date and sowing treated seed after shade drying.

Adoption level of type of bio fertilizers- It was observed from Table 2 that majority (62.50 per cent) of the respondents had complete adoption about PSB, 57.50 per cent had complete adoption about Rhizobium, 45.83 per cent had complete adoption about Acetobacter, 27.50 per cent had complete adoption about Azotobacter and 14.17 per cent had complete adoption about Azospirillum. It was observed from Table 2 that the respondents (20.83 per cent) had partial adoption about Azotobacter, 20.00 per cent had partial adoption about Rhizobium, 17.50 per cent had partial adoption about Acetobacter, 16.66 per cent had partial adoption about PSB and 8.33 per cent had partial adoption about Azospirillum.

Adoption level of forms of bio fertilizers- It was observed from Table 2 that majority (61.67 per cent) of the respondents had complete adoption about powder form of bio fertilizers and 41.67 per cent had complete adoption about liquid forms of bio fertilizers. It was observed from Table 2 that less than one third (32.50 per cent) of the respondents had partial adoption about liquid form of bio fertilizers and 18.33 per cent had partial adoption about powder form of bio fertilizers.

Adoption level of sources of bio fertilizers availability- Less than half (49.17 per cent) of the respondents had complete adoption of bio fertilizers from agro service centre and 47.50 per cent of the respondents had complete adoption of bio fertilizers from Agriculture College. Less than one third (30.83 per cent) of the respondents had partial adoption of the bio fertilizers from Agriculture College and 30.00 per cent of the respondents had partial adoption of the bio fertilizers from agro

service center. One fourth (25.00 per cent) of the respondents had partial adoption of the bio fertilizers from Agriculture Department.

Adoption level of methods of bio fertilizers application - More than two third (68.33 per cent) of the respondents had complete adoption of seed treatment and majority (68.83 per cent) of the respondents had complete adoption of application of bio fertilizers through irrigation water. Very few (4.17 per cent and 2.50 per cent) of the respondents had complete adoption of soil application and seedling dipping methods of bio fertilizers application, respectively. More than one third (37.50 per cent) of the respondents had partial adoption of the soil application method and 27.50 per cent of the respondents had partial adoption of seedling dipping method of bio fertilizers application. Only 12.50 per cent of the respondents had partial adoption of application through irrigation water method and 10.83 per cent had partial adoption of seed treatment method of bio fertilizers application.

Adoption level of time of bio fertilizers application- Majority (71.67 per cent) of the respondents had complete adoption of bio fertilizers before sowing, while 57.50 per cent of the respondents had complete adoption of bio fertilizers after sowing of the crops. Less than one fourth (22.50 per cent) of the respondents had partial adoption of bio fertilizers after sowing, while only 7.50 per cent of the respondents had partial adoption of bio fertilizers before sowing of the crops.

Adoption level of dose of bio fertilizers application- It is observed from Table 2 that majority (69.17 per cent) of the respondents had adopted complete seed treatment dose and only 10.83 per cent of the respondents had adopted partial seed treatment dose for application of Bio fertilizers to crops. More than two third (67.50 per cent) of the respondents had completely adopted dose of bio fertilizers application by irrigation water method. Only 12.50 per cent had adopted partial dose of irrigation water method of Bio fertilizers application. More than one fourth (28.33 per cent) of the respondents had partial adoption of dose of seedling dipping method of Bio fertilizers application. More than one third (36.67 per cent) of the respondents had partial adoption of dose of soil application method of Bio fertilizers and only 3.33 per cent of the respondents had adopted complete dose of soil application method of bio fertilizers.

Adoption level of care and management of bio fertilizers- Majority (71.67 per cent) of the respondents had completely kept away bio fertilizers from heat and sunlight and 70.00 per cent respondents had complete use of bio fertilizers without mixing with pesticides and fungicides and use of bio fertilizers before expiry date. More than two third (67.50 per cent) of the respondents had completely adopted application of bio fertilizers at adequate moisture condition and 60.00 per cent of respondents had completely adopted treated seed sown after shade drying.

Table 3. Classification of the respondents according to their overall adoption

Sl. No.	Category (Score)	Respondents (n=120)	
		Number	Per cent
1.	**Low level** (Up to 26)	24	20.00
2.	**Medium level** (Between 27 to 104)	77	64.17
3.	**High level** (105 and above)	19	15.83
	Total	**120**	**100.00**

Regarding overall adoption, Table 3 indicated that majority (64.17 per cent) of the respondents had medium level adoption, followed by 20.00 per cent of them having low level adoption and 15.83 per cent of the respondents had high level adoption. It is concluded that majority of the respondents had medium overall adoption of bio fertilizers.

Respondent's opinion about bio fertilizers use-

Table 4. Classification of respondents according to their opinion about bio fertilizers use

Sl. No.	Particulars	Respondents (n=120)	
		Yes	No
1.	Saving in chemical fertilizers due to use of bio fertilizers.	98 (81.67)	22 (18.33)
2.	Crop productivity increases.	98 (81.67)	22 (18.33)
3.	Average productivity increased.	10.30 %	

Majority (81.67 per cent) of the respondents had agreed about the saving in chemical fertilizers due to use of bio fertilizers and crop production increased by using bio fertilizers. About 10.30 per cent average crop production increased due to use of bio fertilizers reported by the farmers

2. Constraints and obtained suggestions about use of bio fertilizers from farmers

Table 5. Constraints faced by the farmers in adoption of bio fertilizers (n=120)

Sl. No	Constraints	Respondents	
		Number	Percentage
1.	Low shelf life of bio fertilizers.	63	52.50
2.	Non availability of bio fertilizers locally at times when needed.	51	42.50
3.	Lack of knowledge about bio fertilizers practices.	42	35.00
4.	Lack of knowledge about bio fertilizers.	35	29.17

The data from Table 5 revealed that the more than half (52.50 per cent) of the respondents reported low shelf life of bio fertilizers as a major constraint, followed by 42.50 per cent respondents reported non availability of bio fertilizers locally at times when needed, 35.00 per cent farmers reported lack of knowledge about bio fertilizers practices and 29.17 per cent respondents reported lack of knowledge about bio fertilizers as constraints.

It is observed from Table 6 that more than half (52.50 per cent) of the respondents suggested that increase the shelf life of bio fertilizers, 46.67 per cent of the farmers suggested that bio fertilizers should be available at local level, 43.33 per cent of the farmers suggested to provide useful information and literature on bio fertilizers from Agriculture Department and University, 33.33 per cent of the farmers suggested to conduct the demonstrations on bio fertilizers practices and use.

Table 6. Suggestions obtained from farmers about use of bio fertilizers (n=120)

Sl. No	Suggestions	Respondents	
		Nos.	Per cent
1.	Increase the shelf life of bio fertilizers.	63	52.50
2.	Bio fertilizers should be available at local level.	56	46.67
3.	Provide useful information and literature on bio fertilizers from Agriculture Department and University.	52	43.33
4.	Conduct the demonstrations on bio fertilizers practices and use.	40	33.33

CONCLUSION

Majority (64.17 per cent) of the respondents had medium adoption level, followed by 20.00 per cent of them having low adoption level and 15.83 per cent of the respondents had high adoption level of bio fertilizers. 35.00 per cent farmers reported lack of knowledge about bio fertilizers practices and 29.17 per cent farmers reported lack of knowledge about bio fertilizers as the constraints. More than half (52.50 per cent) of the farmers suggested to increase the shelf life of bio fertilizers, 46.67 per cent of the farmers suggested that bio fertilizers should be available at local level, 43.33 per cent of the farmers suggested to provide useful information and literature on bio fertilizers from Agriculture Department and University, 33.33 per cent of the farmers suggested to conduct the demonstrations regarding use of bio fertilizers.

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RESEARCH ARTICLE

Socio-Techno-Economic Change As A Result Of Construction of Check Dam on Tribal Farmers of Dahod District

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ABSTRACT

The study was carried out in Dahod District of Gujarat state with specific objective to study the socio-techno-economic change as a result of construction of check dam on tribal farmers of Dahod district. Dahod district has eight talukas, out of eight talukas two talukas Dahod and Zalod were selected purposively. The data were collected with the help of structural schedule by personal interview method. Dependent and independent variables were measured by using suitable scale. The statistical measure i.e. paired't' test was used. Check dams meet the needs of people who are deprived of major and medium irrigation system and also bridge the imbalance between the progressive regions and backward regions. Check dam has bought significant change in all the aspects (dependent variable) in the study. The irrigation through check dam results in increasing production and ultimately resulted in rising of socio-techno-economic status of farmer in tribal areas of Dahod district of Gujarat state.

Keywords: *socio-techno-economic change, beneficiary tribal farmers.*

Irrigation is the most important natural resources of a country that decides socio-techno-economic development of a civilization. The impact of irrigation is all pervading as it leads to change in cropping pattern, increase yield rates and labour utilization and in the ultimate analysis, brings prosperity to the area. It is recognised that irrigation coupled with high yielding varieties of crops and fertilizers has been the factor in changing production. The irrigation through check dam results in increasing production and ultimately resulted in rising of socio-techno-economic status of farmer in tribal areas. The impacts of the check dam are reflected in terms of socio-techno-economic changes like modern technology, household items, saving and investment, food habit, clothing, housing, social status, social relationship, self-sufficiency, productivity, and cropping intensity generating more income from agriculture and ultimately improving the overall economic condition of tribal farmers. Hence, there is an absolute need to know the present status of technological uptake and adoption of check- dam by the beneficiary farmers. Keeping this in view, the present study was carried out with specific to know the "socio-techno-economic changes as a result of check dam"

METHODOLOGY

The present investigation was undertaken in Dahod district which comes under the jurisdiction of Anand Agricultural University, Anand. This district is comprised of eight talukas. Out of these, two talukas namely Dahod and Zalod was purposively selected for the study as they have maximum area under check dam irrigation. From each selected taluka, six villages were selected purposively. Out of which, three villages having check dam beneficiary farmers and nearby three villages having non-beneficiary farmers. Thus, total twelve villages were selected for the study. From each selected village ten farmers were randomly selected for the study. Thus, total 120 farmers (60 beneficiaries and 60 non-beneficiaries) were selected for the study. Ex-post-facto research design was used for the present study. The data were collected with the help of interview schedule by conducting personal interview method. For the measurement of independent and dependent variables, appropriate scales developed and used with suitable modifications. The statistical tools

were percentage, mean, independent paired‘t’ test and correlation coefficient.

RESULTS AND DISCUSSION

The socio-techno-economic changes that occur to an individual or to a social system as a result of adoption or rejection of an innovation. An attempt has been made to know resultant changes in terms of 11 aspects, viz., modern technology, household items, savings and investment, food habit, clothing pattern, housing condition, social status, social relationship, self-sufficiency, productivity and cropping intensity which were considered as impact of check dam. The data in this regard are presented in Table 1.

Table 1: Aspect wise change occurred as a result of impact of check dam on socio-techno economic status of tribal farmers.

Sr. No.	Characteristics	Mean value		‘t’ value
		Beneficiary farmers (n=60)	Non-beneficiary farmers (n=60)	
1.	Change in modern technology	17.43	14.00	4.057**
2.	Change in house hold item	23.03	16.33	4.664**
3.	Change in saving and investment	3.43	1.85	4.688**
4.	Change in food habits	8.40	6.75	5.597**
5.	Change in clothing patterns	7.27	6.23	7.222**
6.	Change in housing condition	3.37	2.75	4.023**
7.	Change in social status	6.22	4.78	4.480**
8.	Change in social relationship	7.83	7.53	3.418*
9.	Change in self sufficiency	4.12	3.25	5.022**
10.	Change in productivity	1682.40	1408.78	2.648*
11.	Change in cropping intensity	192.33	126.32	19.841**

The data presented in Table 1 revealed that the significant progress was observed in beneficiary farmers in all aspects of socio-techno-economic change. The probable reason for positive change in modern technology might be the farmers increase their purchasing capacity by raising the income through achieving more production. Change in household item might be due to check dam irrigation boosted agriculture growth that leads to increase in income of the beneficiary tribal farmers which ultimately increase their household items. Change in saving and investment might be due to farmers having increased their purchasing capacity by raising the income through achieving more production, therefore change in their saving and investment habit. Change in food habit due to check dam irrigation helps them to take more than one crop in a year that is increase in their income through achieving more production. Now-a-days farmers have taking wheat, rice, milk, maize as well as fruits pulses, vegetables and beans in their daily life different varieties of food in festivals. Change in clothing pattern might be due to raising income through more production they spent more money on basic needs such as clothing, food and household item. Change in housing condition might be due to increase in income has helped them to built pukka houses, traditional houses and maintain every year, designed for proper aeration and whitewash their residence every year. Change in social status due to construction of check dam have positive impact on socio-techno-economic status of farmers there has been an increase in income, improvement in standard of living, education, food habits, crop productivity, farmers have become financially independent and sound. These factors automatically improved their social status. Change in social relationship due to conversation and interaction with people of different organization motivate them

as well as give confidence and develop social communication skill might be the reason for change in relationship. Change in self sufficiency due to adoption of technology, possession of animals, scientific orientation, knowledge and favourable attitude all together makes farmers capable for self sufficient might have been the probable reason for above results. Change in productivity and intensity due to increase in irrigation facilities to the farmers and increase of ground water table might be the possible reason for above result.

CONCLUSION

Check dams meet the needs of people who are deprived of major and medium irrigation system. The check dams are not only benefit to the most dis-advantaged and deprived people, but also bridge the imbalance between the progressive regions and backward regions. Impact occurred due to implementation of check dam was admirable. It has bought significant change in all aspects in the study. Check dam played an important role in accelerating agricultural productivity and positive change in life standard of the beneficiary tribal farmers of Dahod district.

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RESEARCH ARTICLE

The Awareness of Farmers about Weather Forecasting Advisory Services

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ABSTRACT

Weather forecasting is the application of science and technology to predict the state of atmosphere for the future time and a given location. Weather forecasts are made by collecting quantitative data about the current state of atmosphere and using scientific understanding of atmosphere processes to reject the atmosphere will evolve.Knowledge of seasonal climatic forecast allows farmers and other user of climate information to develop seasonal management strategies learning to potential improvement in the productivity. Although the full potential is yet to be realized, seasonal climate forecast have shown promise in determining planting dates, irrigation needs, crop types, fertilization and planting varieties. Expected market condition, pest and disease and the need for the farm insurance for upcoming season can all be estimated using seasonal forecast.The emerging ability to provide timely a skillful weather forecast offers the potential to reduce human vulnerability to agricultural impacts on weather vagaries (Hansen, 2002). The main advantage of weather forecasting advisory services is to help farmers, maximize profit by decreasing weather related losses and increasing the timeliness of farm production, Indian farmers are still depend on the seasonal rains which are highly variable both in time and space including weather event like drought, flood, heat waves, and tropical storms cyclones severely effects the agriculture production.

METHODOLOGY

The study was conducted in purposively selected districts Hisar from western zone and Kaithal from eastern zone of Haryana state, respectively. It is also because of familiarity of researcher with the local condition, convenience and easy accessibility. Two blocks viz. Hisar-1 from Hisar and Kaithal-1 from Kaithal districts were selected randomly. Two villages were selected randomly from each selected block Constantly, Gangua and Dheeranwas from Hisar-1 block and Kyorak and Balwanti from Kaithal-1 blocks were selected randomly for the study. A random sample of 30 farmers from each village was taken. In this way a total number of 120 farmers were selected for the present study.

RESULTS AND DISCUSSION

1. Overall awareness level of respondents

The Table 1 reveals that 44.17 per cent of the respondents had medium level of awareness however 35.00 per cent were having low level of awareness followed by 20.83 per cent of the respondents who had high level of awareness about weather forecasting advisory services. This indicates that 79.17 per cent of the respondent were having medium to low awareness level about weather forecasting advisory services. This indicates that efforts should be made to reach more and more farmers through latest communication technology.

Table 1: Overall awareness level of respondents' about weather forecasting advisory services

Sr. No	Awareness status	Frequency	Per cent
1	Low (>29)	42	35.00
2	Medium (29-33)	53	44.17
3	High (<33)	25	20.83

A.I=Awareness Index N=120

2. Aspect wise awareness of respondents about weather forecasting advisory services.

The aspect wise awareness level of respondents has been presented that 53.34 per cent the respondents were fully aware while 25.00 per cent were aware and 21.66 per cent were not aware with the information provided by CCSHAU. Majority of the respondents (68.33%) were fully aware while 27.50 per cent were found to aware and 4.16 per cent were

not aware with the statement that do you follows bio and non- bio indicators for weather prediction. The Table revealed that half of the respondents (52.50%) were not aware while only 35.00 per cent were fully aware and 12.50 per cent were aware about SMS facility provided by CCSHAU, HISAR. It was found that two third of the respondents (66.67%) were fully aware while 16.67 per cent were aware and 16.67 per cent were not aware about Radio Television mobile as a source of weather forecasting advisory services. In case of use of weather forecast information at the time of irrigation 11.67 per cent of the respondents were fully aware while 18.33 per cent were aware and only 70.00 per cent were not aware.

It was further observed that near about three fourth of the respondents (71.67%) were fully aware whereas, 17.50 per cent were aware and 10.80 per cent were not aware about belief of respondents about panchang weather forecast. In case of use of weather forecasting information at the time of flood and drought majority of the respondents (60.00%) were fully aware while 18.33 per cent were aware and 21.67 per cent were not aware. As regarding the source of weather forecasting information about half of the respondents (50.00%) were not aware followed by 30.83 per were aware and only 19.16 per cent were fully aware. In case of success rate of weather forecasting information about 58.33 of the respondent were fully aware while 23.34 per cent aware and 18.33 per cent were not aware.

Table 2. Aspect wise awareness about weather forecasting advisory services (N=120)

Sr. No	Aspects	Awareness level				Mean
		Fully Aware		Aware		Not aware		
		N	%	N	%	N	%	
1	Do you know about weather forecasting advisory services provided by CCSHAU	64	53.34	30	25.00	26	21.66	2.40
2	Do you follows bio and non- bio indicators for weather prediction.	82	68.33	33	27.50	5	4.16	2.56
3	Do you aware of SMS facilities provided by CCSHAU.	42	35.00	15	12.50	63	52.50	1.69
4	Do you know about Radio Television and mobile as source of weather forecasting advisory services?	80	66.67	20	16.67	20	16.67	1.55
5	Farmers can use the weather forecasting advisory services at the time of irrigation and pesticide spray	14	11.67	22	18.33	84	70.00	2.58
6	Do you aware of Panchang weather forecast.	86	71.67	21	17.50	13	10.80	2.59
7	Do you know the usefulness weather forecasting advisory services at the time of flood and drought.	72	60.00	22	18.33	26	21.67	2.42
8	Have you aware of source of weather forecasting.	23	19.16	37	30.83	60	50.00	1.47
9	Do you aware of weather forecasting advisory services is primarily farmers concern.	81	67.50	28	23.34	11	9.17	2.48
10	Do you aware that weather forecasting advisory services becoming true in agriculture are usually 60-70 per cent.	70	58.33	28	23.34	22	18.33	2.35

3. Aspect wise awareness about applicability of weather forecasting advisory services

It was found that majority of the respondents (70.83%) were fully aware whereas 16.67 per cent were aware while only 12.50 per cent were not aware about change in seed sowing process affected by the weather forecasting information. In case of effect of weather forecast on irrigation schedule majority of the respondents (66.67%) were fully aware. whereas, 20.00 per cent were aware while only 13.34 per cent were not aware.

It was observed that 56.67 per cent of the respondents were fully aware and 16.67 per cent were aware however 26.67 per cent were not aware about change in fertilizer application schedule. It was revealed from the Table 4.8 that 55.00 percent of the respondents were fully and 23.34 per cent were not aware while 21.67 per cent were about change in spray schedule due to information given agro-meteorology department. It was revealed that about half (50.00%) of the respondents were fully aware whereas 26.67 per cent were aware and 23.34

per cent were not aware about any change in cultural operation due to weather forecasting information. Moreover, 52.50 per cent respondents were not aware about change in harvesting due to weather forecasting advisory services followed by 35.00 per cent were fully aware and 12.50 per cent were aware about it.

Two third respondents reported that they were fully about change in day to day farm operation as per weather forecasting advisory services, while 16.67 per cent were aware while 16.67 per cent were not aware followed by 66.67 per cent were fully aware. Half of the respondents were not aware and 19.16 per cent were fully aware whereas, 30.83 per cent were aware about change in marketing schedule.

Table 3. Aspect wise awareness about applicability of weather forecasting advisory services

N=120

Sr. No.	Statement	Fully Aware N	%	Aware N	%	Not aware N	%	Mean score
1	Change in seed sowing process.	85	70.83	20	16.67	15	12.50	2.60
2	Change in irrigation schedule.	80	66.67	24	20.00	16	13.34	2.54
3	Change in fertilizer application schedule.	68	56.67	20	16.67	32	26.67	2.44
4	Change in weed management practices.	64	53.34	32	26.67	24	20.00	2.38
5	Change in spray schedule.	66	55.00	26	21.67	28	23.34	2.31
6	Change in cultural operations.	60	50.00	32	26.67	28	23.34	2.25
8	Change in harvesting schedule.	42	35.00	15	12.50	63	52.50	1.69
7	Change in day to day farm operation.	80	66.67	20	16.67	20	16.67	1.55
9	Change in marketing of procedure.	23	19.16	37	30.83	60	50.00	1.47

4. Aspect wise awareness of source of weather forecast information

It was observed that majority of the respondents (75.00%) were fully aware whereas 20.83 per cent were ware while only 4.16 per cent were not aware about Radio as a source of weather forecasting information. However in case of Television more than half of respondents (66.67%) were fully aware whereas, 28.33 per cent were aware while only 13.34 per cent were not aware.

As high as 61.67 per cent of the respondents were fully aware whereas, 25.48 per cent were aware and 12.50 per cent were not aware about newspaper as a source of weather forecast information. More than one third (35.00%) of the respondents were fully aware about SMS facilities provided by CCS HAU. However, 12.50 per cent were aware while 52.50 per cent were not aware about SMS facilities provided by CCSHAU. Near about one fifth (19.16%) of the respondents were fully aware whereas 30.83 per cent were aware while 50.00 per cent were not aware about phone call about weather forecasting advisory services. Internet was not known by the respondents.

Table 4: Aspect wise awareness of source of weather forecast information (N=120)

Sr. No.	Sources	Awareness level						Mean score
		Fully Aware N	%	Aware N	%	Not aware N	%	
1.	Radio	90	75.00	25	20.83	5	4.16	2.72
2.	T.V	80	66.67	34	28.33	16	13.34	2.69
3.	Newspaper	74	61.67	31	25.48	15	12.50	2.59
4.	SMS facilities provided by CCSHAU.	42	35.00	15	12.50	63	52.50	1.69
5.	Internet	20	16.67	20	16.67	80	66.67	1.55
6.	Phone call	23	19.16	37	30.83	60	50.00	1.47

CONCLUSION

It was revealed that majority of the respondents possessed medium level of awareness with the information provided by CCS HAU, Hisar As regard about the belief on bio and no-bio indicators for weather forecast information majority of the respondents had high response as compare with scientific weather forecasting. In case of SMS facility provided by CCSHAU, HISAR majority of the respondents possessed low level of awareness. Regarding about using of weather forecasting information majority of the respondents had low level. It was found that majority of the respondents had high level of awareness about Radio Television mobile as a source of weather forecasting advisory services. In case of use of weather forecast information at the time of irrigation majority of the respondents had low level of awareness. It was observed that majority of the respondents possessed high level of regarding belief of respondents about Panchang forecast. In case of use of weather forecasting information at the time of flood and drought majority of the respondents had high level. As regarding about source of weather forecasting information about half of the respondents level of awareness.

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RESEARCH ARTICLE

Perception of Recommended Crop Protection Practices of Cashew in Sindhudurg District of Maharashtra

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ABSTRACT

Maharashtra state is now a day known as the economic power of the country. State government had launched an ambitious horticulture development programme linked to EGS and NHM with the inception of Horticultural Development Scheme so the farmer's tendency is being changed. Area under cashew is increasing but the production is not increasing at faster rate. Non adoption of crop protection practices by majority of farmers might be one of the reasons for this. Hence present study was conducted at R.F.R.S., Vengurle to analyze the adoption of recommended package of practices approved by Dr.B.S.K.K.V., Dapoli for cashew growers. The data regarding awareness level of recommended crop protection practices for cashew crop revealed that majority of the respondents for the year 2013-14, 2014-15 and 2015-16 were 'high'. However, the adoption level of recommended crop protection practices for the year 2013-14, 2014-15 and 2015-16 revealed that, the 'high' adaptation. The large majority of the respondents had high to medium adoption of recommendations pertaining to crop protection practices in cashew production and quite a considerable number of respondents had not undertaken any control measures against pests and diseases of cashew. Only supplying the inputs may not solve the problems of non-adoption of plant protection practices. Educating the farmers is the prime importance rather than providing them inputs. Training-cum-demonstration activities by the Agril. University with the help of State Agriculture Department to elevate the awareness level of cashew growers about recommended crop protection practices. These activities would lead in increasing both the rate of awareness and adoption level of recommended crop protection practices in cashew.

Key words: *Awareness, Crop protection, Economic power, Pest, disease*

METHODOLOGY

The study was conducted in Sindhudurg district of South Konkan region of Maharashtra. Three tahsils namely, Kudal, Kankawali and Vaibhawadi were selected for the year 2013-14, Dodamarg, Sawantwadi and Vengurle were selected for the year 2014-15, while Malvan, Devgad and Sawantwadi were selected for the year 2015-16. From each tahsil 8 villages were selected on the basis of maximum area under cashew cultivation. From each of the village 5 cashew growers who possessed a minimum 1 acre area under cashew plantation and had grown the crop commercially were selected. Thus, the total sample size becomes 120 for each year.

- ***Awareness about plant protection practices***:

It was measured with the help of knowledge test developed for the study. The knowledge test consists of 16 items related to recommended crop protection practices for controlling pests and diseases on cashew trees. The test was administered to the respondents. The response of each respondent on each item was obtained on two point continuum; whether they had understand or did not understand about recommended crop protection package of practices. It was measured in terms of 'YES' or 'NO' by assigning the score of the test. Therefore, the score ranged from 0 to 16 if all recommended practices were not known or known, respectively. The score of each respondent was then converted into percentage with the help of formula are as follow,

$$\text{Knowledge of the respondents (\%)} = \frac{\text{Obtained score}}{\text{Maximum score}} \times 100$$

Thus, on the basis of the total knowledge percentages obtained from respondents were classified into three categories by using formula mean ± 1 S.D.

- ***Adoption of recommended plant protection practices***:

In this present study adaption was considered as the continuous use of recommended plant protection practices for cashew pests and diseases fully or partially by the respondents. The response of respondents with respect to each of 16 practices considered for the study were obtained on three point continuum *viz.*, full adoption, partial adoption and no adoption. The score assigned were '2', '1' and '0' for 'full', 'partial' and 'no' adoption, respectively. The overall adoption of the recommended crop protection measures for cashew crop was calculated for each respondent with the help of adoption score obtained for each recommended crop protection practice of cashew crop. Thus, for the 16 practices; the maximum score was 32. This score was then converted into adoption index by using the following formula,

$$\text{Adoption index} = \frac{\text{Obtained score}}{\text{Maximum score}} \text{ X } 100$$

On the basis of adoption index, the respondents were classified into three categories by using the following formula of mean ± 1 S.D.

An interview schedule was specially developed for the data collection. The data were compiled, tabulated and analyzed by using standard statistical tools.

RESULTS AND DISCUSSION

- ***Awareness level of the cashew growers about recommended crop protection practices***:

The result of the present investigation in respect of the level of awareness of the cashew growers about recommended crop protection practices for cashew crop by the cashew growers are presented in Table1.

It is observed from Table 1 that, during 2013-14 the majority (53.33%) of the respondents had high level of awareness while 32.50 per cent and 14.17 per cent of the respondents had medium and low level of awareness, respectively. Similarly, during 2014-15 the maximum high awareness level reported with 69.17 per cent. However, medium and low awareness level gets 23.33 per cent and 7.5 per cent score, respectively. During the year 2015-16, awareness level of the respondents found higher with 72.50 per cent, while remaining respondents had medium (17.50%) and low (10.00%) level of awareness.

Table 1. Distribution of the respondents according to their level of awareness

Awareness (Percentage)	Respondents	
	Number	Percentage
2013-14		
Low (Up to 37.54)	17	14.17
Medium (37.55 to 97.32)	39	32.50
High (97.33 and above)	64	53.33
TOTAL	**120**	**100.00**
2014-15		
Low (Up to 37.54)	09	7.50
Medium (37.55 to 97.32)	28	23.33
High (97.33 and above)	83	69.17
TOTAL	**120**	**100.00**
2015-16		
Low (Up to 37.54)	12	10.00
Medium (37.55 to 97.32)	21	17.50
High (97.33 and above)	87	72.50
TOTAL	**120**	**100.00**

The findings lead to conclude that nearly less than 15 per cent of the respondents had low awareness level about the recommendations. In the present study it was observed that majority of the cashew growers good kind of awareness about recommended crop protection practices of cashew crop. Various extension activities may be the reason for the high adoption level.

- ***Adoption level of the cashew growers regarding recommended crop protection practices of cashew***:

The data presented in Table 2 revealed that, during the year 2013-14 the 48.33 per cent respondents had adopt high adoption level, while 9.17 per cent of the respondents had no adoption. Only 13.33 per cent and 29.17 per cent of the respondents had low and medium adoption level, respectively. Similarly, during 2014-15 the high adoption level observed

with 64.17 per cent. However, only 2.50 per cent no adoption level had observed from the cashew growers. 8.33 and 25.00 per cents of respondents had reported low and medium adoption level, respectively. The majority of respondents had high (67.51%) adaptation level during the year 2015-16. However, rest of the respondent show medium (22.50%), low (6.66%) and no (3.33%) level of adoption, respectively.

Table 2. Distribution of the respondents according to their overall adoption level

Adoption level	Respondents	
	Number	**Percentage**
2013-14		
No (Zero)	11	9.17
Low (Up to 8.63)	16	13.33
Medium (8.64 to 65.15)	35	29.17
High (65.16 and above)	58	48.33
TOTAL	**120**	**100.00**
2014-15		
No (Zero)	03	2.50
Low (Up to 8.63)	10	8.33
Medium (8.64 to 65.15)	30	25.00
High (65.16 and above)	77	64.17
TOTAL	**120**	**100.00**
2015-16		
No (Zero)	04	3.33
Low (Up to 8.63)	08	6.66
Medium (8.64 to 65.15)	27	22.50
High (65.16 and above)	81	67.51
TOTAL	**120**	**100.00**

The findings lead to concluded that the large majority of the respondents had high to medium adoption of recommendations pertaining to crop protection practices in cashew production and quite a considerable number of respondents had not undertaken any control measures against pests and diseases of cashew.

It is observed from these findings that there are also small gaps for increasing adoption of the recommended crop protection practices for cashew. From Table 1 and 2 it is observed that half or more than half of the respondents had high level of awareness and adoption level about recommended crop protection practices of cashew. Only supplying the inputs may not solve the problems of non-adoption of plant protection practices. Educating the farmers is the prime importance rather than providing them inputs.

CONCLUSION

Training-cum-demonstration activities by the Agriculture University with the help of State Agriculture Department to elevate the awareness level of cashew growers about recommended crop protection practices. These activities would lead in increasing both the rate of awareness and adoption level of recommended crop protection practices in cashew.

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RESEARCH ARTICLE

Training Needs and Constraints Faced by the Rainfed Cotton Growers

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ABSTRACT

In Maharashtra mostly cotton is cultivated under rainfed condition through tradition method. So, production of cotton is low with low quality. Extension agencies are engaged in various sectors of development in the country and are working for giving the training to the farmers about new improved practices. The present investigation was carried out in Jamkhed and Karjat tahsils of Ahmednagar districts. The results of study revealed that majority of cotton growers had medium level of knowledge about cotton production technology. Seventy five per cent of cotton growers had complete knowledge in transportation and picking of cotton; while, partial knowledge was observed in storage followed by preparatory tillage, sowing time and seed treatment. Three-fourth proportion of cotton growers had no knowledge about plant protection measures and fertilizer management. The respondent's chararcterists viz; family size, cropping pattern and source of information exhibited a non-significant relationship with their training needs; while, size of land holding and knowledge had positive and significant relationship with the training needs of cotton growers . All the rainfed cotton growers from low productivity area cultivated the cotton on traditional method. The average yield under such cultivation is comparatively less because of lack of knowledge about improved package of practices. The present knowledge of farmers was identified and steps should be taken to improve their knowledge through process of training. To increase the production, efficiency and quality of rainfed cotton crop, training programme was prove useful. In view of this, the present investigation was planned with specific objectives: To access the Correlates of Training needs and Constraints faced by Rainfed Cotton Growers.

***Keywords**: Cotton Production Technology, knowledge, Training Needs, Constraints and Suggestions*

METHODOLOGY

The present investigation was conducted in Jamkhed and Karjat tahsils of Ahmednagar districts. These tahasils were purposively selected for the study purpose since the productivity of these both tahasils were very low as compared to other tahsils of Ahmednagar district. The list of villages having maximum area under cotton crop from sample tahsils was prepared with the help of State Department of Agriculture and fourteen villages were selected having lowest productivity. Thus, in all total 120 cotton growers Cotton growers were selected by proportionate random sampling method. Knowledge was quantified by aassigning scores 0, 1 and 2 for no knowledge, partial knowledge and full knowledge respectively. Scoring was done by developing the schedule. Maximum score was 28, whereas minimum score was the 10. Accordingly, the respondents were classified in to five different categories on the basis of range. Training Need Index of Rainfed Cotton growers were calculated in the form of Most Needed, Needed and Not Needed by assigning score of 2, 1 and 0 respectively. Training Need Index of the Rainfed Cotton Growers were calculated by using following formula.

$$\text{Training Need Index (TNI)} = \frac{\text{Total obtained score}}{\text{Maximum obtainable score}} \times 100$$

RESULTS AND DISCUSSION

Knowledge level of the cotton growers

The information pertaining to the level of knowledge regarding cotton Production technology possessed by the cotton growers was collected, tabulated and analyzed. Results are presented in Table- 1.Table- 1 revealed that, more than fifty per cent (53.33 per cent) of cotton growers had medium level of knowledge, whereas, 16.67 per cent respondents had high level of knowledge followed by 11.66 per cent of the respondents had low level of knowledge. About 10.00 per cent of the cotton growers had very high level of knowledge about cotton production technology.

Table-1: Distribution of the respondent cotton growers by their level of knowledge (n = 120)

Sr. No.	Characteristics category	Nos.	Per cent
1.	**Very low** (Up to 15 score)	10	8.34
2.	**Low** (16 to 18 score)	14	11.66
3.	**Medium** (19 to 21 score)	64	53.33
4.	**High** (22 to 24 score)	20	16.67
5.	**Very high** (25 and above)	12	10.00
	Total	**120**	**100.00**

Table- 2. Practice wise knowledge of the cotton growers

Sr. No.	Practices in Cotton Production Technology	Level of knowledge (n = 120)		
		Complete knowledge	Partial knowledge	No knowledge
1.	Soil type/ Soil testing (Medium, well drained)	17 (14.18)	65 (54.16)	38 (31.66)
2.	Recommended Varieties (Phule Dhanwantari, Rajat, Kanak)	18 (15.00)	42 (35.00)	60 (50.00)
3.	Preparatory tillage (1-ploughing, 2-harrowing)	12 (10.00)	90 (75.00)	18 (15.00)
4.	Sowing time (1st or 2nd week of June)	17 (14.16)	90 (75.00)	13 (10.84)
5.	Spacing (Deshi – 60 x 15 Bt – 90 x 90)	27 (22.50)	60 (50.00)	33 (27.50)
6.	Inter cropping (Mung, Udid, Soybean)	28 (23.33)	42 (35.00)	50 (41.67)
7.	Seed treatment (Thiram, Captan, Azatobacter)	12 (10.00)	85 (70.83)	23 (19.17)
8.	Fertilizer management (125:65:65 kg NPK/ha)	13 (10.84)	37 (30.83)	70 (58.33)
9.	Intercultivation (Herbicide– Pyrithiobak) (Hand weeding, harrowing)	22 (18.33)	60 (50.00)	38 (31.67)
10.	Water management (At flowering, boll maturation, use of drip irrigation)	28 (23.34)	50 (41.66)	42 (35.00)
11.	**Plant protection**			
	American boll worm, red cotton bug, spotted boll worms : (Quinolphos 20 EC 20 ml in 10 liter water)	09 (07.50)	21 (17.50)	90 (75.00)
	Aphid and Jassid : Thimithoxam 70 W.S. 4 g/kg seed)			
	White fly (Acitamaprid 20 SP 4 g)			
	Root rot and wilt (Seed treatment with Trichoderma)			
12	Picking (2-3 hand picking)	90 (75.00)	27 (22.50)	3 (2.50)
13	Storage (before storing, sun drying for 3-4 days)	7 (05.84)	100 (83.33)	13 (10.83)
14	Transportation (Bullock cart, Tractor, Temp, Railway)	90 (75.00)	23 (19.16)	7 (5.84)
15	Marketing (Local market, tahasils market,district market and other state	28 (23.33)	80 (66.67)	12 (10.00)

The data from Table-2 1indicates that 75 per cent of cotton growers had complete knowledge in transportation and picking followed by Marketing (23.33 per cent),Intercropping (23.33 per cent); while, 83.33 per cent of cotton growers had partial knowledge about storage, followed by preparatory tillage, sowing time (75.00 per cent), seed treatment (70.83 per cent) and marketing (66.67 per cent).Further, 75.00 per cent cotton growers had no knowledge about plant protection followed by fertilizer management (58.33 per cent) and recommended varieties (50.00 per cent).

Correlation between selected independent and dependent variable -

The information regarding relationship between selected personal and socio-economic characteristics of respondents and training needs of cotton growers was presented in Table-3.

Table-3 Correlation between selected independent and dependent variable

Sr. No.	Independent Variable	Correlation Coefficient
1.	Age	-0.232*
2.	Education	-0.211*
3.	Annual income	-0.466**
4.	Family size	+0.064$^{N.S.}$
5.	Size of land holding	+0.181*
6.	Social participation	-0.181*
7.	Cropping pattern	+0.015$^{N.S.}$
8.	Source of information	-0.052$^{N.S.}$
9.	Knowledge	+0.183*

*= Significant at 5 per cent level N.S. = Non -significant
** = Significant at 1 per cent level

Among the selected characteristics of the cotton growers, only family size, cropping pattern and source of information exhibited a non-significant relationship with their training needs. Whereas age, education, annual income and social participation exhibited negative and significant relationship with their training needs at 5 per cent probability level. Size of land holding and knowledge of the cotton growers had positive and significant relationship with the training needs.

Constraints faced by the rainfed cotton growers

The information pertaining to the constraints faced by respondents is presented in Table-4.

Table 4.Constraints faced by rainfed cotton growers

Sr. No.	Constraints	Freq. (n = 120)	Per cent
1.	High cost labour	103.00	85.33
2.	High cost of pesticides and fungicides	87	72.50
3.	Lack of organizing training programmes	81	67.50
4.	Scarcity of water for irrigation	77	64.16
5.	Lack of information about market rate	63	52.50
6.	Lack of knowledge about use of chemical fertilizer	57	47.00

It is seen from the Table-4, a majority of the respondents (85.83 per cent) had faced constraints viz; high cost of labour, high cost of pesticide and fungicides (72.50 per cent) followed by lack of organizing training programmes(67.50 per cent) and 64.16 per cent of the respondents faced the problem about scarcity of water for irrigation. 52.50 per cent and 47.00 per cent of the respondents had faced the problem related to lack of information about market rate and lack of knowledge about use of chemical fertilizer, respectively.

Table-5. Suggestions of the rainfed cotton growers to overcome the constraints

Sr. No.	Suggestions	Freq. N=120	Per cent
1.	Low cost of labour	103	85.83
2.	Low cost of pesticide and fungicide	87	72.50
3.	To organize training programme at proper time	81	67.50
4.	Advanced technology for efficient use of water	77	64.16
5.	Provide information about market rate	63	52.50
6.	Provide knowledge about use of chemical fertilizer	57	47.00

From Table- 5 it is observed that 85.83 per cent of the respondents suggested that cost of labour should be low, followed by low cost of pesticide and fungicide (72.50 per cent). 67.50 per cent of the respondents had the suggestions about organizing the training programme at proper time. 64.16 per cent of the respondents had the suggestions for to provide advanced technology for efficient use of limited water. 52.50 per cent of the respondents suggested to provide information about market rate followed by to provide the knowledge about use of chemical fertilizer (47.00 per cent).

CONCLUSION

The findings of the study indicated a large majority of the cotton growers faced the constraints viz., high cost of labour, high cost of pesticides/ fungicides, lack of organizing training programmes, scarcity of water for irrigation and lack of information about market rate. A large majority of cotton growers suggested that lower the cost of labour and pesticides / fungicides, organize training programme at proper time, provide advanced technology for efficient use of limited water and appropriate market rates for cotton. In this context, it is concluded that cotton growers need to be trained by organizing one day training programme at their own village by State Agricultural University through lecture and practice combine method before start of every season.

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RESEARCH ARTICLE

Extent of Adoption of Protected Cultivation Technology among the Trained Farmers of North Bihar

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ABSTRACT

P*rotected Cultivation though has variety of agriculture application but mainly it is being considered for the production of horticulture crops like vegetables and ornamental flower. It is estimated that small area approximately fifty thousand hectares is under protected cultivation in India. Protected cultivation of high value vegetables and cut-flowers has shown tremendous potential during the last decade or so. With the progress of liberalized economy and the advent of newer technologies in agriculture, protected cultivation opens up avenues in agriculture hitherto not seen. The three districts namely Samastipur, Muzzaffarpur and Darbhanga district of North Bihar were purposively selected based on the criterion of the implementation of Protected cultivation technology. Total 30 villages selected from three districts of Samastipur, Muzaffarpur and Darbhanga. Out of which 14 villages from Samastipur, 11 villages from Muzaffarpur and 5 villages from Darbhanga district has been taken. 20 trained and 20 untrained respondents were selected randomly from three districts and 21 blocks. The total sample size constitutes 40 respondents for the study. Mean score of extent of adoption of trained farmers was 20.80 and that of untrained farmers was 16.60. The Standard deviation of trained farmers was 3.63 and that of untrained farmers was 2.43. Majority of trained respondent had medium of adoption(45 percent) followed by respondent having high level of adoption (35 percent) and only 10 of them high level of adoption. While in case of untrained respondent 65 percent of them had medium level of adoption and 35 percent had low level of adoption but none of them had high level of adoption.*

Key Words: *Extent of Adoption, Protected Cultivation, Dissemination, Production Technology*

METHODOLOGY

1. Locale of the study- The study was conducted in Bihar state with focus on the North region of the state comprising three district namely Samastipur, Muzaffarpur and Darbhanga.

2. Selection of the districts- The three districts namely Samastipur, Muzzaffarpur and Darbhanga district of North Bihar were purposively selected based on the criterion of the implementation of Protected cultivation technology

3. Selection of Blocks -Total 21 blocks has been selected from three districts of Samastipur, Muzaffarpur and Darbhanga. Out of which 9 blocks from Samastipur, 8 blocks from Muzaffarpur and 4 blocks from Darbhanga has been taken .The details of selection of district and location of the blocks has been given below in table.

4. Selection of Villages - Total 30 villages selected from three districts of Samastipur, Muzaffarpur and Darbhanga. Out of which 14 villages from Samastipur, 11 villages from Muzaffarpur and 5 villages from Darbhanga district has been taken. The details of selection of the villages from different blocks has been given in the table below

5. Selection of the respondents.- 20 trained and 20 untrained respondents were selected randomly from three districts and 21 blocks. The total sample size constitutes 40 respondents for the study.

The level of adoption was measured in terms of full adoption, partial adoption and non-adoption of recommended protected cultivation technology. For full adoption of technology a score of 3 was given and for partial adoption a score of 2 was given and for non-adoption a score of 1 was given. Individual

score was later converted to standardize score of adoption index with help of following formula.

$$\text{Adoption index} = \frac{\text{Obtained score}}{\text{Highest obtainable score}} \times 100$$

RESULTS AND DISCUSSION

The extent of adoption of protected cultivation technology among the trained farmers

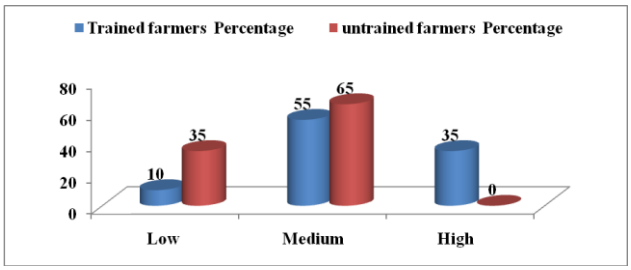
To measure the extent of adoption of protected cultivation technology a simple schedule was prepared consisting 10 items of adoption and respondents were asked to give their level of adoption on three point scale of 'full adoption', 'partial adoption', 'non adoption'. The data thus collected were analyzed and results are given in table -1

Table 1. Frequency and Percentage distribution of trained and untrained farmers with respect to their extent of adoption.

S N	Category	Trained farmers (n=20)		Untrained farmers (n=20	
		Freq.	Per cent	Freq.	Per cent
1	**Low** (Mean –SD)	2	10	7	35
2	**Medium** (Mean ± SD)	11	55	13	65
3	**High** (Mean + SD)	7	35	0	0
	Total	**20**	**100**	**20**	**100**

Mean of trained farmers was 20.80 and that of untrained farmers was 16.60.Standard deviation of trained farmers was 3.63 and that of untrained farmers was 2.43.

It is clear from the above table that in case of trained respondent, 55 percent of them had medium level of adoption and 35 percent of trained respondent had high level of adoption. There were only 10 percent of trained respondent who had low level of adoption. While in case of untrained respondent 65 percent of them had medium level of adoption and 35 percent had low level of adoption. None of the untrained respondent had high level of adoption.



Mean score of extent of adoption of trained farmers was 20.80 and that of untrained farmers was 16.60. The Standard deviation of trained farmers was 3.63 and that of untrained farmers was 2.43. Majority of trained respondent had medium of adoption(45 percent) followed by respondent having high level of adoption (35 percent) and only 10 of them high level of adoption. While in case of untrained respondent 65 percent of them had medium level of adoption and 35 percent had low level of adoption but none of them had high level of adoption.

CONCLUSION

With the progress of liberalized economy and the advent of newer technologies in agriculture, protected cultivation opens up avenues in agriculture hitherto not seen. Mean score of extent of adoption of trained farmers was 20.80 and that of untrained farmers was 16.60. The Standard deviation of trained farmers was 3.63 and that of untrained farmers was 2.43. Majority of trained respondent had medium of adoption(45 percent) followed by respondent having high level of adoption (35 percent) and only 10 of them high level of adoption.

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RESEARCH ARTICLE

Practices Adopted by the Farmers to Minimize the Residual Effect of Sewage Water on Crop and Human Health

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ABSTRACT

The present study on "Knowledge of farmers about effects of sewage water on crop and human health" was undertaken in 2 tehsils (Daund and Haveli) of Pune district with sample size of 80 respondents. The data were collected on personal, socio-economic, psychological characteristics and communication characteristics of respondents, their knowledge about effect of sewage water on crop and human health, constraints faced by them and suggestions made to overcome the problems regarding residual effect of sewage water on crop and health studied with the help of pre structured interview schedule. Majority of the respondents were included in middle age group with education level up to secondary school with small size of land holding with annual income in between Rs. 1,50,000 to 4,00,000 with 10 to 36 years of farming experience, medium level of sources of information, medium level of social participation, medium level of risk orientation, medium level of economic motivation and also medium level of managerial ability with medium level of knowledge. Majority of constraints faced by the respondents expressed that scarcity of water especially in summer season, High cost of equipments used for treating sewage water. Similarly, The farmers expressed that agrochemicals and fertilizers factories are drained out harmful substances in river that causes adverse effects on crops, leaching losses increase concentration of heavy metals in soil and water sources, followed by lack of proper guidance, less technical knowledge, improper handling of sewage water are also the major issue regarding the use of sewage water; answer of the questions should be given peacefully and satisfactorily.

Keywords*: Knowledge level, effects of sewage water, Risk Orientation, Managerial Ability*

The water demand for agriculture sector is increasing day by day due to intensive agriculture however, in contrast to that is availability is reducing day by day due to erratic, infrequent, insufficient and less rain through mansoon, Further, more use of irrigation water, high water demanding crops, monocrops, consistent growing of similar crop on same land, faulty irrigation methods etc. are the major reasons for the scarcity of the irrigation water, Therefore, it is very essential to find out the alternate way for tapping other source of water for agriculture. Sewage water is major alternate source of water which can be used safely after treatment. Treated and untreated sewage water availability in major cities of India is increasing day by day. This sewage water is being widely used by farmer in sub-urban areas around metro cities for growing vegetables. According to recent estimates, it has been found in India that sewage water annually irrigated about 1.5 million hectares of land and have potential to contribute about one million tons of essential nutrients because of its high available and soluble essential nutrients this water is producing good yield with Mula-mutha is the river in Pune which laters meets the Bhima River. Due to high level of water pollution including 125 MLD (million Liter per Day) of untreated sewege water discharged into river by the Pune Municipal Corporation. Considering increased pollution 'Pune municipal corporation' has constructed 6 new sewage treatment plants. This treated water then discharge into river but as river move forward towards Haveli and Daund tahsil it affected due to effluent drained into river from different chemical and fertilizers companies. In these tehsils lots of farmers in villages continuously use sewage water for

cultivating vegetables. However, increasing adverse effects on soil, crop and also on human health through residual effect while consuming vegetables. The systematically designed research study with reference to knowledge about adverse effect of sewage water by vegetable growers in Pune region has not been conducted so far. Therefore, it was necessary to study Knowledge of vegetable growers about adverse effect of sewage water with this background, the present study was conducted with following specific objectives. To study the practices adopted by the farmers to minimize the residual effect of sewage water on crop and human health and To study the constraints faced by the farmers and suggestions made by them in minimizing the residual effect of sewage water on crop and human health.

METHODOLOGY

Pune district consists of thirteen tahsils (Junnar, Ambegaon, Rajgurunagar, Maval, Mulashi, Daund, Bhor, Velhe, Purandar, Baramati, Haveli, Shirur, Indapur) out of this Haveli and Daund these two tahsils was purposively selected because it shares major area under vegetable cultivation which grown on the highly polluted water of Mula-Mutha river. Four villages from Haveli and Daund tahsils were selected considering the maximum area under vegetable cultivation grown on Mula-Mutha river which polluted from industries sewage water and different type of effluent. Based on the information obtained from the Taluka Agriculture Officer. Thus, in all 8 villages were selected.

RESULTS AND DISCUSSION

The practices adopted by farmers to minimize the residual effect of sewage water on crop and human health.

Regarding the minimizing the residual effect of sewage water Majority of respondents (76.25 per.cent) said that 'proper used practices of irrigation practices reduce the adverse effects of polluted water' followed by, majority of respondents (72.50 per cent) suggested that 'use of different resistant varieties of different crops for the sewage water.' besides that 85.00 per cent respondents not known about the seriousness of water sampling before use for irrigation. 95.00 per cent farmers not used chemicals for treating that sewage water.

Table 1: Distribution of the respondents according to the practices adopted by farmers to minimize the residual effect of sewage water on crop and human health.

Sr. No	Different measures for Sewage water to minimize residual effect	Respondents (n=80)	
		Yes	No
1.	Use of Sewage water filtration System for treating sewage water.	12 (15.0	68 (85.00)
2.	Use specific varieties of different Crops.	58 (72.5)	22 (27.5)
3.	Use of proper irrigation schedule practices.	61 (76.2	19 (23.75)
4.	Use of alternate source of water for irrigation.	09 (11.2	71 (88.75)
5.	Use of sewage water by treating it with chemicals.	04 (5.00)	76 (95.00)
6.	Soil sample must be check to know The harmful content in soil before sowing of particular crop.	10 (12.5	70 (87.50)
7.	Water sample testing for appropriate dose of fertilizer to the crop.	12 (15.0	68 (85.00)

On other hand,87.50 per cent farmers not checked chemical content in soil for specific crop. Followed by, people not analyzed micronutrients per cent before applying sewage water to field. Only 11.25 per cent of respondent thinking about use of alternate source of water.

The constraints faced by farmers and suggestions made by them in minimizing residual effect of sewage water on crop and human health.

The constraints and suggestions were invited about knowledge level of respondent about adverse effects of sewage water. The details of knowledge level of a respondent are summarized in table 2. It is also found that, 83.75 per cent of respondents had problems regarding the 'Alternate source of

water not available in summer'. On other hand, it is found that, 80.00 per cent of farmers not use treating equipments because of their high cost.

Table 2: Details of constraints faced by farmers in minimizing residual effect of sewage water on crop and human health.

Sr. No.	Constraints faced by farmers	Respondents (n=80)	
		Yes	No
1.	Alternate source of water not available in summer months.	**67** (83.75)	**13** (16.25)
2.	High cost equipments used for Filtration of sewage water.	**16** (20.00)	**64** (80.00)
3.	Unavailabity of chemicals used for filtration of water.	**21** (26.25)	**56** (73.75)
4.	Agricultural officer not gives guidance about sewage water and its use and according to selection of crop.	**19** (23.75)	**61** (76.25)
5.	Lack of technical knowledge regarding use of treating equipment's for treating equipments.	**12** (15.00)	**68** (85.00)
6.	Severe impact of salt concentration in soil and water sources due to leaching from polluted water of river.	**72** (90.00)	**08** (10.00)

It is observed that from table no.2 that, almost all 85.00 per cent farmers had lack of technical knowledge regarding sewage water. Most of the farmers 90.00 per cent faced problem like leaching losses from polluted water of river. Other important cognition to the vegetable growers 81.25 per cent is that 'Sewage water should be used according to type of crops and types of soil'. Whereas, majority of respondents (77.5 per cent) said that 'solve the problem of water in summer, farm ponds and check dams should be build'. Further, Important cognition to the farmers (41.25 per cent) was that 'Fertilizer should be applied after applying sewage water. Most of the farmers (70.00 per cent) should not use sewage water at the time of harvesting of vegetables.

Table 3: Details of suggestions made by farmers in minimizing residual effect of sewage water on crop and human health.

Sr. No.	Suggestions gives by farmers	Respondents (n=80)	
		Yes	No
1.	Corporation should provide alternate source of treated sewage water	**73** (91.25)	**07** (8.75)
2.	To solve the problems in summer, farm ponds and check dams should be build.	**62** (77.5)	**18** (22.5)
3.	Sewage water should not be used while harvesting vegetables.	**24** (30.00)	**56** (70.00)
4.	Fertilizers should be applied after applying sewage water.	**33** (41.25)	**37** (46.25)
5.	Chemicals used for treating sewage water though it is costly but should available easily.	**66** (82.5)	**14** (17.5)

CONCLUSION

Majority of constraints faced by the respondents expressed that scarcity of water especially in summer season, High cost of equipments used for treating sewage water. Similarly, The farmers expressed that agrochemicals and fertilizers factories are drained out harmful substances in river that causes adverse effects on crops, leaching losses increase concentration of heavy metals in soil and water sources, followed by lack of proper guidance, less technical knowledge, improper handling of sewage water are also the major issue regarding the use of sewage water; answer of the questions should be given peacefully and satisfactorily.

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RESEARCH ARTICLE

Assessment of MPKV Recommended Paddy Technology in Kolhapur District

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ABSTRACT

The study revealed that, majority (50.77 per cent) of the paddy growers belonged to the middle age group. While teo-fifth (59.23 per cent) of the paddy growers had secondary and higher secondary education. Majority (56.92 per cent) of the paddy growers belonged to joint & medium size family. Majority (68.46 per cent) of the paddy growers had land holding less than 1 hectare. The average land holding is 0.98 ha. While average income is Rs. 182322/- A large majority (93.07 per cent) of the paddy growers was member of co-operative sugar industry and majority (74.17 per cent) of paddy growers obtaining information through Agril. Assistant of Agril. University. Regarding knowledge paddy growers had knowledge about soil type, preparatory tillage, seed rate, sowing time, improved early variety Ratnagiri -24, Midlate variety Jaya, scented varieties viz; Bhogavati & Indrayani, inter culturing practices and fertilizer management for early, midlate and scented varieties, crop duration, harvesting, yield. While all farmers are adopting soil, ploughing, puddling, time of sowing/transplanting. While technologies adopted by farmers namely fertilizer management for midlate and late variety is (60.00 per cent) and plant protection measures (70.00 per cent). About one-third of the farmers facing problems inadequate labour and higher labour wages, unavailability of required variety seeds at input dealers and production cost is more. While 41.54 per cent of the farmers suggested improved variety seeds from university should be available followed by organization of training sessions.

METHODOLOGY

The study is conducted in the College Development Block situated in Hatkanangle, Radhanagari and Bhudharghar tahsils of Kolhapur district. Total 13 villages from College Development Block were selected randomly. From these villages 10 farmers from each village were selected randomly. The farmers were interviewed with the help of structured interview schedule personally. In all 130 farmers were interviewed for this study. The data were tabulated and processed through the primary and secondary tables. The statistical tools like frequency, percentages, and means of the averages was used for interpreting the data and inferences are drawn.

RESULTS AND DISCUSSION

The present study revealed that, majority (50.77 per cent) of the paddy growers belonged to the middle age group. The average age of the respondent is 39 years. Majority (59.23 per cent) of the paddy growers had secondary and higher secondary education. Majority (56.92 per cent) of the paddy growers belonged to joint family and More than half (52.30 per cent) of the paddy growers had medium size family. All the paddy growers had agriculture as their main occupation and large majority (86.15 per cent) had dairy as their secondary occupation. Majority (68.46 per cent) of the paddy growers had land holding less than 1 hectare. The average land holding is 0.98 ha. Majority (52.30 per cent) of the paddy growers had annual income between Rs. 1,50,001/- to Rs. 3,50,000/-. While average income is Rs. 182322/-

Social participation

The data indicated that a large majority (93.07 per cent) of the paddy growers was member of co-operative sugar industry followed by co-operative credit society (80.77 per cent). Nearly equal number (55.00 per cent each) of the respondents are member of *Pat Santha* and *Dudh Sangh.*

Table 1. Classification of paddy growers according to the sources of information.

Sr. No.	Sources of information	Parentages (n=120)		
		Always	Sometimes	Never
A)	**Personal contact method**			
1.	Agril. Asstt. of Agril. University	118 (90.77)	12 (9.23)	-
2.	Agriculture Department	80 (61.53)	48 (36.93)	2 (1.54)
3.	Relatives /Friends	54 (41.54)	71 (54.61)	5 (3.85)
4.	Progressive farmers	66 (50.77)	61 (46.92)	3 (2.31)
5.	Local leaders	39 (30.00)	80 (61.54)	11 (8.46)
B)	**Group contact method**			
1.	Crop demonstrations	16 (12.31)	104 (80.00)	10 (7.69)
2.	Subject Matter Specialists	5 (3.85)	92 (70.77)	33 (25.38)
3.	Scientists from Agril. University	3 (2.31)	117 (90.00)	10 (7.69)
C)	**Mass contact method**			
1.	Radio	27 (20.77)	71 (54.62)	32 (24.62)
2.	Television	69 (53.07)	52 (40.00)	9 (6.93)
3.	Newspapers	75 (57.69)	48 (36.92)	7 (5.38)
4.	Agril. Publications	38 (29.23)	79 (60.77)	13 (10.00)
5.	Agril. Exhibitions	25 (19.23)	87 (66.92)	18 (13.85)
6.	Farmers educational tour	21 (16.16)	82 (63.07)	27 (20.77)

*Figures in Parenthesis indicates percentages

Sources of information: The information pertaining to sources of information used by paddy growers was obtained and is presented in Table 1.

The data indicated that a majority (74.17 per cent) of paddy growers were always obtaining information through Agril. Assistant of Agril. University. Followed by Agriculture Department (61.53 per cent) as a source of personal contact method. A large majority (91.67 per cent and 53.07 per cent) of the paddy growers always obtained information through newspaper and television. Considerable number (29.23 per cent) of the respondents use agril. Publication as a source of information.

Information about paddy cultivation

The data from Table 4 indicate that a large majority (91.54 per cent) of the paddy growers were sowing the seed in the month of June. Two-fifth (40.77 per cent) of the paddy growers cultivating Bhogavati variety followed by other private varieties (27.69 per cent) Regarding the yield, a large majority 87.69 per cent of paddy growers obtained yield less than 40 quintals per hectare

Paddy cultivation experience

The data from Table 5 indicated that majority (43.85 per cent) of the paddy growers were cultivating paddy crop for 11 to 20 years, followed by 20.77 per cent of them cultivating paddy form 20 to 30 years. The average experience in paddy cultivation is 22 years.

Knowledge and adoption of improved paddy technology.

Knowledge : The data indicated that almost all the paddy growers had knowledge about soil type, preparatory tillage, seed rate, sowing time, improved early variety Ratnagiri -24, Midlate variety Jaya, scented varieties viz; Bhogavati & Indrayani, inter culturing practices and fertilizer management for early, midlate and scented varieties, crop duration, harvesting, yield. Also they were aware about intercrops in paddy ie, Soybean, Sun hemp and Wal. More than 90.00 per cent of the paddy growers had knowledge about green manuring, it application, seed treatment, spacing, scented variety Basmati-370, fertilizer application for hybrid varieties, crop protection for stem borer, army worm, smut and crab. Majority them had knowledge about stage wise water management (83.08 per cent) weed control (81.54 per cent) and *Chatusutri* method (74.61 per cent).

Adoption: The data further revealed that all farmers are adopting soil, ploughing, puddling, time of sowing/transplanting. While fertilizer management for midlate and late variety is (60.00 per cent) and plant protection measures (70.00 per cent).

University Technology, Variety and Recommendations

Table 2. Classification of paddy growers according to their knowledge and adoption about university variety and recommendation

Sr. No.	Technologies/Recommendation	Adoption (n= 130)				
		Knowledge		Adoption		
		Complete	No	Complete	Partial	No
1	**Variety**					
	Bhogawati	**130** (100.00)	-	**51** (39.23)	**6** (4.62)	**73** (56.15)
	Phule Radha	**90** (69.23)	**40** (30.77)	**22** (16.92)	-	**108** (83.08)
	Phule Samrudhi	**114** (87.69)	**16** (12.31)	**10** (7.69)	**5** (3.85)	**115** (88.46)
2	Western Maharashtra Ghat Zone as per fertilizer dose equation the Kharip Paddy cultivation is recommended for achieving 30 to 40 qts/ha yield	**122** (93.85)	**8** (6.15)	**30** (23.08)	**7** (5.38)	**93** (71.54)
3	Maximum yield of Indrayani variety 75 % recommended dose of Nitrogen and potassium through Urea & DAP briquette and 50 Kg. + 2 ton paddy straw and 3 ton of glarecidia leaves.	**110** (84.62)	**20** (15.38)	**8** (6.15)	-	**122** (93.85)
4	Sub Mountain Zone - recommended fertilizer dose with 10 ton compost/ha. And seed treatment of Azotobactor, PSB for 40 Qts./ha. production	**103** (79.23)	**27** (20.77)	**34** (26.15)	**7** (5.38)	89 (68.47)
5	For western Maharashtra Sub Mountain Zone for shallow soil 75 % recommended fertilizer dose in briquette form at the time of sowing application of 1 briquette between two lines at interval of 27 C.M. with Crow bar at 8 – 10 C.M. depth.	**91** (70.00)	**39** (30.00)	**2** (1.54)	-- --	**128** (98.46)
6	For Maharashtra Sub Mountain Zone transplanting of seedlings at the age of 14 days	**88** (67.69)	**42** (32.31)	**3** (2.31)	**2** (1.54)	**125** (96.15)
7	Blast, Leaf scald, bacterial blight, brown spot & Discoloration - control by IPM	**86** (66.15)	**44** (33.85)	**18** (13.85)	-- --	**112** (86.15)
	Application of paddy husk ash 1 kg/sq.mt. before sowing on flat bed					
	Seed treatment of Benomil fungicide and Pseudomonas furosance Bio control 3 gm. And 5 gm./kg respectively					
	Mixing of paddy straw 2 tons/ha. Before planting					
	3 Spraying of Propiconzol or Carbondazium fungicides 10 ml./gm. Per 10 liter water at the interval of 15 days					
8	Application of 640 ml. Axiflurophen	**89** (68.46)	**41** (31.54)	**40** (30.77)	-- --	**90** (69.23)
9	Maximum yield of paddy (Basmati) + Gram mix cropping Basmati sowing = 5 tons compost + 100 N/ha. Gram= 2-3 days after sowing application of 640 ml. Axiflurophen 23.5 E.C. (25 kgs urea + 50 Kg Spurad/ha.)	**83** (63.85)	**47** (36.15)	**6** (4.62)	**1** (0.77)	**123** (94.61)

The majority (60 to 75 per cent) of the paddy growers are aware about university technologies and recommendations. But the adoption is less except Bhogawati (39.23 per cent). This may be might due to the major crop of the Kolhapur district is sugarcane. The farmers who are cultivating paddy crop is noncommercial. The majority of the farmers cultivating paddy crop for domestic use.

Constraints faced by the paddy growers.

The data regarding the constraints faced by the paddy growers are depicted in Table. 3 and the results obtained are as follows.

Table 3. Distributions of paddy growers according to their constraints.

S. N.	Constraints	Respondents (n=130)	
		Nos.	Per cent
1.	Inadequate labour and high wages.	40	30.77
2.	Unavailability of compost / FYM	24	18.46
3.	Unavailability of Urea briquette	12	9.23
4.	Unavailability of insecticides and pesticides in time	16	12.30
5.	Production cost is more	40	30.77
6.	Heavy incidence of pest and diseases (Change in atmosphere).	25	19.23
7.	Costly chemical fertilizers	23	17.69
8	Unavailability of bio-pesticides	12	9.23
9	Unavailability of required variety seed at input dealer	40	30.77

It is revealed from Table-3 that (30.76 per cent each) of farmers facing problems inadequate labour and higher labour wages, unavailability of required variety seeds at input dealers and production cost is more. Nearly twenty percent farmers facing constraints namely Heavy losses caused by insect pests and diseases followed by unavailability of FYM /compost in adequate quantities (18.46 per cent) and costly chemical fertilizers (17.69 per cent)

Suggestions made by the paddy growers.

The data regarding the suggestions made by the paddy growers are presented in Table. 4 and the results obtained are as follows. It is revealed from Table-4 that majority (41.54 per cent) of farmers suggested that improved variety seeds from university should be made easily available followed by training sessions for improved paddy cultivation technology should be organized before onset of season (20.00 per cent) and provision of minimum support price for paddy crop by the government (15.38 per cent). The percentage of respondents suggested limit of crop loan from banks and other financial institutions for paddy crop should be increased is 11.53 per cent.

Table 4. Classification of paddy growers according to suggestions made by them.

S. N.	Suggestions	Respondents (n=130)	
		Nos.	Per cent
1.	Pre seasonal Training of paddy cultivation	26	20.00
2.	Soil testing should be done	7	5.38
3.	University variety seed should be easily available	54	41.53
4.	Cooperative farming	12	9.23
5.	Resistance variety to insect and pest	14	10.77
6.	Crow-bar implements should be made available	6	4.61
7.	Availability of urea briquette on subsidy	7	5.38
8.	Limit of paddy crop loan should be increased	15	11.54
9.	*Hamibhav (MSP)*	20	15.38

CONCLUSION

Even though the farmers have the knowledge of university technologies/ recommendations, the adoption is very less. The Agricultural Department motivate the farmers by organizing special campaign with agriculture university. For Providing the seed of university varieties the seed village programme should be implemented through Research Stations, Krishi Vigyan Kendra and College Development Block by university

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RESEARCH ARTICLE

Influence of Profile of Agro-Service Providers and Beneficiaries on the Sales and Purchasing Behaviour

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ABSTRACT

Relationship between the eighteen selected characteristics of agro-service providers and beneficiaries to their sales and purchasing behaviour was studied in the conducted in Navsari district of Gujarat state. The sample for the study composed of total 200 beneficiaries' respondents and 100 agro-service providers were obtained for the present study. The study concluded that the majority of the agro-service providers and beneficiaries has age, education, occupation, annual income, social participation, land holding, farming experience, innovativeness, economic orientation, scientific orientation, risk orientation, overall modernity, progressiveness, management orientation, attitude of agro-service providers and beneficiaries, information input and processing behaviour, knowledge level were the critical variables influence the sales and purchasing behaviour of agro-service providers and beneficiaries.

Keywords: *Agro-service providers, Beneficiaries, sales, purchase, Psychological, Situational Characteristic.*

Agriculture is a backbone of Indian economy. It has a critical role to play in the country's economic development. With ever increasing human population, there is an increasing demand to raise the production. There are two basic way of augmenting the production, first enlarging the area cultivated by expanding agriculture operation to virgin areas and secondly to increase the productivity of land already under cultivation. As there almost no scope to expand the cultivated area because the average size of operational holding is decreasing day by day due to pressure of population, therefore, the ultimate way of increasing production is to raise the productivity level. Among the all measures to raise the productivity level, plant protection is in central position. Plant protection is a basic exercise in any crop for control of insect-pest and disease, etc. to avoids economic losses especially in this field as well as for overall agricultural development, the Agro-service providers are playing an important role with their marketing environment and limitation were the main points of interest.

The government considered the presence of private service providers and their role in agriculture. Agro service provider can be said as an agency which provides his service with various inputs to the farmers at their places, at right time, in sufficient quantity with affordable prices and quality. Agro service providers play an important role in varied aspects of plant protection. At field level, when the farmers perceive any problem they are normally approaching agro-service providers to overcome their problems. It is observed that the presence of agro-service providers have influenced the decision making process of farmers. However, the extension personnel at different levels are helping the farmers but their lack of coverage often compel the farmers to consult with agro-service providers. Basically, they are easily available that's why they are playing a major role indirectly in rural areas. Along with the public sector extension machinery, resourceful environment, non-government organizations, private agencies and well developed co-operative structures have been found to be major factors for the development of the above enterprises. the present study was undertaken with following specific objectives:To analyze the relationship between the personal, socio-economic, psychological and situational characteristics and sales and purchasing behaviour of agro-service providers and beneficiaries.

METHODOLOGY

The present investigation was purposely conducted in all five talukas *viz*; Chikhli, Gandevi, Jalalpore, Navsari and Vansda of Navsari district. An ex-post facto research design was adopted to conduct the study. A proportionate random sampling method was used to obtain the ASPs from respective talukas. As a result, 32 of Chikhli from 151, 10 of Gandevi from 47, 8 of Jalalpore from 42, 32 of Navsari from 151 and 18 of Vansda from 83 ASPs were obtained. In all, 100 ASPs were obtained for the present study. According to the proportionate numbers of each taluka, a simple random sampling method was used to get the name of ASPs. These were approached personally and name of five villages as well as farmers who came to purchase critical inputs for their agriculture during last six months. Once again, the list of suggested villages and farmers was prepared and from it one village and two farmers selected randomly. Thus, the sample for the study composed of total 200 beneficiary respondents. Eighteen independent and three dependent variables were identified for the study. The collected data were analyzed by using appropriate methods of analysis *viz.*, percentage, mean, standard deviation, and correlation coefficient(r)

RESULTS AND DISCUSSION

Relationship between personal profile and sales and purchasing behavior of agro- service providers and beneficiaries.

From table 1, it could be seen that the age (0.2549**), education (0.2031*), size of family (0.2106*), occupation (0.2216*), annual income (0.2053*), social participation (0.2116*), land holding (0.2714**), farming experience (0.2468*), innovativeness(0.2115*), economic orientation (0.2067*), risk orientation (0.2043*), management orientation (0.2110*), attitude(0.2572**) and knowledge (0.2345*) of agro-service providers were having positively significant association with their sales and purchasing behaviour . On the other hand, the overall modernity (-0.0433), and information input and processing behaviour (-0.0148) of agro-service providers had not found any relationship with their sales and purchasing behavior, whereas scientific orientation (0.0901) and progressivism (0.1720) had non-significant relationship.

Table:1 Relationship between the personal characteristics and sales and purchasing behavior of agro-service providers and beneficiaries (n=100/200)

Sr. No.	Personal characteristics	Correlation coefficients (*r*)		
		ARPs	BRs	Pooled
1.	Age	0.2549**	0.1901**	0.2062**
2	Education	0.2031*	0.1560*	0.1857**
3	Size of family	0.2106*	0.1543*	0.1837**
4	Occupation	0.2216*	0.1419*	0.1820**
5	Annual income	0.2053*	0.1435*	0.1831**
6	Social participation	0.2116*	0.1431*	0.1795**
7	Land holding	0.2714**	0.1436*	0.2039**
8	Farming experience	0.2468*	0.0358	0.0564
9	Innovativeness	0.2115*	0.1543*	0.1621**
10	Economic orientation	0.2067*	0.1683*	0.1824**
11	Scientific orientation	0.0901	0.0424	0.0753
12	Risk orientation	0.2043*	0.0436	0.0679
13	Overall modernity	-0.0433	0.1532*	0.0762
14	Progressivism	0.1720	0.1020	0.0825
15	Management orientation	0.2110*	-0.0605	0.0479
16	Attitude of ASPs and BRs towards agriculture	0.2572**	0.2358**	0.2475**
17	Information input and processing behaviour	-0.0148	0.1535*	0.0918
18	Knowledge of their enterprise	0.2345*	0.1716*	0.2082**

* Significant at 0.05 percent level ** Significant at 0.01 percent level

However, the age (0.1901**), education (0.1560*), size of family (0.1543*), occupation (0.1419*), annual income (0.1435*), social participation (0.1431*), land holding (0.1436*), innovativeness (0.1543*), economic orientation (0.1683*), overall modernity (0.1532*), attitude of ASPs and BRs (0.2358**), information input and processing behaviour (0.1535*) and knowledge of their enterprise (0.1716*) of beneficiaries were found to have positively significant association with their sales and purchasing behaviour. Whereas the management orientation of beneficiaries (-0.0605) had not found any relationship with their sales and purchasing behaviour.

In pooled, the age (0.2062**), education (0.1857**), size of family (0.1837**), occupation (0.1820**), annual income (0.1831**), social participation (0.1795**), land holding (0.2039**), innovativeness (0.1621**), economic orientation (0.1824**), attitude of ASPs and BRs towards agriculture (0.2475**) and knowledge of their enterprise (0.2082**) of agro-service providers and beneficiaries were found to have positive and highly significant association with their sales and purchasing behaviour. The above findings suggested that the null hypothesis was partly accepted and partly rejected.

The association inferred with the age, education, land holding, annual income, innovativeness, farming experience, risk orientation, and knowledge level of agro-service providers and beneficiaries. The probable reason for this might be that the respondents possessed more experience, adequate land holding with enough infrastructural facilities for their enterprise.

CONCLUSION

The finding of the study suggest that the attributes viz., age, education, occupation, annual income, social participation, land holding, farming experience, innovativeness, economic orientation, scientific orientation, risk orientation, overall modernity, progressiveness, management orientation, attitude of agro-service providers and beneficiaries, information input and processing behaviour, knowledge level were the critical variables influence the sales and purchasing behaviour of agro-service providers and beneficiaries and In pooled the age, education, size of family, occupation, annual income, social participation, land holding, innovativeness, economic orientation, attitude of ASPs and BRs towards agriculture and knowledge of their enterprise of agro-service providers and beneficiaries were found to have positive and highly significant association with their sales and purchasing behaviour.

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RESEARCH ARTICLE

Extent of Adoption of Compost Making Practices by the farmers

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ABSTRACT

The present study was undertaken in Akola district of Maharashtra State with the objectives; to study the profile of farmers, to study the knowledge and adoption of compost making practices by the farmers and to identify the constrains faced by the farmers in adoption of composting practices. An exploratory design of social research was used. A sample of 150 farmers as respondents were drawn and information was obtained from them which were considered for tabulation and analysis of data. Findings reveals that majority of the respondents (66.00%) were middle aged having middle school education (52.67%) with small and semi medium land holding (66.00%) and had annual income ranging between Rs. 50,000 to Rs. 1,00,000 (46.00%), majority possessed animals (74.66%) up to 4 herds and regularly contact (70.00%) input dealers. Majority of respondents (62.66%) were found to be mediocre in possession of knowledge about composting practices. Moreover, majority of the respondents had knowledge about size of pit (80.00%), filling of pit up to 1 ft. above ground level (80.00%). However, comparatively less percentage of respondents (34.67%) had knowledge about spraying of 1 kg decomposed culture with 90 lit. of water and cow dung mixture. Regarding adoption of compost making practices, more than fifty per cent respondents partially adopted the practices like watering the layers in compost pit (66.00%), thickness of layer (55.33%), filling of pit up to 1 ft. above ground level (51.33%) and turning the layers in compost pit (50.00%). However, majority of respondents did not covered/plastered the top of compost pit with mixture of cowdung and mud (70.00%) as well as did not adopt the practices like spraying of 1 kg decompose culture [S-9 /PDKV decompose culture] with 90 lit. of water and cowdung mixture (6.00%.). Majority of the respondents (68.66%) did not use any/single decompose culture while preparing the compost in compost pit.Non availability of information about use of decompose culture as well as non organization of trainings and demonstrations on decompose culture were expressed by the respondents (84.67% and 79.33%, respectively). Cent per cent respondents expressed a problem of non- availability of labours in time as well as high wages of labours (81.33%).

***Key words**: Knowledge, adoption, compost*

Compost is the natural process of 'rotting' or decomposition of organic matter by microorganisms under controlled conditions. Raw organic materials such as crop residues, animal waste, food garage, some municipal waste and suitable industrial wastes, enhance their suitability for application to the soil as a fertilizing source, after having undergone composting. It is rich source of organic matter. It provides a stable organic matter that improves the physical, chemical and biological properties of soils, thereby enhancing soil quality and crop production.

METHODOLOGY

An exploratory design of social research was used in the present investigation as the study aimed at ascertaining the knowledge and adoption of composting methods by the farmers.The present investigation was carried out in ten villages of Akola and Barshitakli Panchayat Samities in Akola district. From each selected village, fifteen farmers were selected randomly who possessed more than two animals. Thus, total 150 farmers constitute the sample for the study. The data was collected by personally interviewing the selected farmers.

RESULTS AND DISCUSSION

The data with respect to various characteristics of the respondents have been furnished in Table 1reveals that majority of the respondents were of middle aged (66.00%) followed by 24.00 per cent in

young age category and remaining 10.00 per cent respondents were in old age category. More than fifty percent of the respondents had education up to middle school (52.67%). The respondents educated up to primary school and college level were 11.33 per cent and 12.00 per cent, respectively. A meager percentage of respondents were found to be illiterate (2.67%).Nearly one third of the respondents (34.00% and 32.00% respectively) belonged to small and semi-medium land holding category. A meager percentage of respondents (6.67%) were in large land holding category.

Table 1 Distribution of the respondents according to their characteristics

Sr. No.	Variables and category	Respondents (N=150)	
		Number	Per cent
1.	**Age**		
	Young (Up to 35 years)	36	24.00
	Middle (36 to 50 years)	99	66.00
	Old (Above 50 years)	15	10.00
2.	**Education**		
	Illiterate	04	02.67
	Primary school	17	11.33
	Middle school	79	52.67
	High school	32	21.33
	College	18	12.00
3.	**Land holding :**		
	Marginal (Up to 1 ha.)	20	13.33
	Small (1.01 to 2 ha.)	51	34.00
	Semi-medium (2.01 to 4 ha.)	48	32.00
	Medium (4.01 to 10 ha.)	21	14.00
	Large (Above 10 ha.)	10	6.67
4.	**Annual Income**		
	Up to Rs. 50,000	49	32.67
	Rs. Rs. 50,000 to Rs. 1,00,000	69	46.00
	Above Rs. 1,00,000	32	21.33
5.	**Livestock possession**		
	Up to 4 herds	112	74.66
	5-10 herds	28	18.67
	Above 10 herds	10	6.67
6.	**Extension contact**		
	Low	45	30.00
	Medium	67	44.67
	High	38	25.33
7.	**Scientific orientation**		
	Low	39	26.00
	Medium	81	54.00
	High	30	20.00

It could be seen that most of the respondents (46.00%) had annual income in between of Rs. 50,000/- to Rs. 1,00,000/, followed by 32.67 per cent respondents belonging to income group of up to Rs. 50,000/-.Majority of the respondents (74.66%) were having herd up to 4 herds, followed by 18.67 per cent of them who possessed herds between 5-10and remaining 6.67 per cent having more than ten herds. Data pertaining to extension contact of respondents for seeking information about composting methods nearly half of the of respondents (44.67%) kept medium extension contact followed by 30.00 per cent and one fourth of respondents i.e. 25.33 per cent of the respondent having low and high extension contact with extension agencies, respectively.

Knowledge of respondents about compost making practices:

The data pertaining to distribution of the respondents according to their knowledge about compost making practices it is seen that cent percent respondents had knowledge about selection of site for composting, watering layers in compost pit and turning the layers in compost pit. Majority of the respondents had knowledge about chopping of farm waste before putting into compost pit (94.00%), size of pit [10x2x1 mt.](80.00%), filling of pit upto 1 ft. above ground level (80.00%) and time required for complete decomposition of organic manure (80.00%).Moreover, majority of the respondents had knowledge about thickness of layer [6 inch](74.67%) and covering/plaster the top of pit with mixture of cow dung and mud (72.66%). However, comparatively less percentage of respondents (34.67%) had knowledge about spraying of 1 kg decomposed culture with 90 lit. of water and cow dung mixture.

Adoption of compost making practices

It is apparent that majority of the respondents (70.00%) had selected proper site for compost preparation. Moreover, more than fifty per cent respondents partially adopted the practices in/of compost making like watering the layers in compost pit (66.00%), thickness of layer (55.33%), filling of pit up to 1 ft. above ground level (51.33%) and turning the layers in compost pit (50.00%). However, majority of respondents did not covered/plastered the top of compost pit with mixture of cow dung and mud (70.00%) as well as did not adopt the practices like spraying of 1 kg

decompose culture [S-9 /PDK decompose culture] with 90 lit. of water and cowdung mixture (6.00%.). Further, it was found that the practice like Chopping of farm waste before putting into compost pit (40.00%) and turning the layers in compost pit at proper time (30.00%) did not adopted at all by the respondents in compost making.

Table 2: Distribution of respondents according to their level of knowledge about compost making practices

Sr. No.	Category	Respondents (N=150)	
		Number	Percentage
1.	Low	22	14.67
2.	Medium	94	62.66
3.	High	34	22.67
	Total	**150**	**100.00**

It is seen from Table 2 that majority of the respondents (62.66%) had medium level of knowledge about compost making practices. While 22.67 per cent respondents were having high level of knowledge and 14.67 per cent respondents were having low level of knowledge about compost making practices

Adoption level: The data pertaining to distribution of the respondents according to their level of adoption of compost making practices are depicted in Table 3 and it is seen that nearly fifty percent of the respondents (49.33%) were included under medium category of adoption of compost making practices. Whereas more than one third of the respondents (34.00%) were found in low adoption category and remaining 16.67 per cent respondents were found in high adoption category.

Table 3: Distribution of respondents according to their level of adoption of compost making practices

Sr. No.	Category	Respondents (N=150)	
		Number	Percentage
1.	Low	51	34.00
2.	Medium	74	49.33
3.	High	25	16.67
	Total	**150**	**100.00**

Constraints expressed by the respondents in adoption of composting methods

It is apparent from Table 4 that regarding technical constraints, majority of the respondents (100.00%) stated that lack of knowledge about PDKV composting method and lack of knowledge about benefits of using decompose culture (82.67%) were the constraints faced by them. In case of information constraints, majority of the respondents (84.67%) stated that non availability of information about use of decompose culture and as well as the trainings and demonstrations on decompose culture (79.33%) were not organized by the extension agency. Cent per cent respondents expressed a problem of non availability of labours in time as well as high wages of labours(81.33%).

Table 4: Distribution of respondents according to constraints expressed by them in adoption of composting methods

Sr. No.	Constraints	Respondents (N=150)	
		Number	Percentage
A)	**Technical constraints**		
i.	Lack of knowledge about decompose culture	124	82.67%
ii.	Lack of knowledge about PDKV composting method	150	100.00%
B)	**Informational constraints**		
i.	Non availability of information about use of decompose culture	127	84.67%
ii.	Non organization of trainings and demonstrations on use of decompose culture	119	79.33%
C)	**Other constraints**		
i.	Non availability of labours in time	150	100.00%
ii.	High wages of labours	122	81.33%

CONCLUSION

Findings reveals that majority of the respondents (66.00%) were middle aged having middle school education (52.67%) with small and semi medium land holding (66.00%) and had annual income ranging between Rs. 50,000 to Rs. 1,00,000 (46.00%), majority possessed animals (74.66%) upto 4 herds and regularly contact (70.00%) input dealers. Majority of respondents (62.66%) were found to be mediocre in possession of knowledge about compost making practices. Nearly fifty per cent respondents (49.33%) were found to be moderate in adoption of compost making practices. However, comparatively less percentage of respondents (34.67%) had knowledge about spraying of 1 kg decomposed culture with 90 lit. of water and cow dung mixture. More than fifty per

cent respondents (53.33%) were aware about decompose culture namely S-9, followed by PDKV decompose culture (32.67%). It is worthwhile to note that majority of the respondents (73.33%) did not aware about use decompose culture for accelerating the decomposition process of organic matter in compost pit. Moreover, more than fifty per cent respondents partially adopted the practices of compost making like watering the layers in compost pit (66.00%), thickness of layer (55.33%), filling of pit up to 1 ft. above ground level (51.33%) and turning the layers in compost pit (50.00%). However, majority of respondents did not covered/plastered the top of compost pit with mixture of cow dung and mud (70.00%) as well as did not adopt the practices like spraying of 1 kg decompose culture [S-9 /PDKV decompose culture] with 90 lit. of water and cow dung mixture (6.00%.). Majority of the respondents (68.66%) did not use any/single decompose culture while preparing the compost in compost pit. Non availability of information about use of decompose culture as well as non organization of trainings and demonstrations on decompose culture were expressed by the respondents (84.67% and 79.33%, respectively). Cent per cent respondents expressed a problem of nonavailability of labours in time as well as high wages of labours(81.33%).

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RESEARCH ARTICLE

Attitude of Rainfed Area Farmers towards the Farm Implements

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ABSTRACT

Agriculture sector is one of the most significant parts of Indian economy. The fortune of agriculture in Maharashtra on a large chunk of area depends on temporal and spatial distribution of South-West monsoon rains and still majority (82.10 per cent) area comes under rainfed agriculture. Farm mechanization is very important in increasing commercialization of agriculture as it contributed to the increase in output due to timeliness of operations and increasing precision in input application. Farm mechanization saves time and labor, cuts down crop production costs in the long run, reduces post-harvest losses and boosts crop output and farm income. But the level of Mechanization of different operations in Indian agriculture is different from operations to operations (Singh et. al. 2011). Favorable or unfavorable attitude of end users plays an important role in the adoption or rejection of an innovation. Therefore, it was felt necessary to study the attitude of rainfed area farmers towards farm implements and its relationship with the knowledge and utilization. By keeping this in mind the study was undertaken with an objective to study the attitude of rainfed area farmers towards the farm implements and to study the relationship of attitude with knowledge and utilization of farm implements by the rainfed area farmers.

Keywords: *Mechanization, attitude, rainfed and farm implements*

METHODOLOGY

The study was conducted in Karmala and Mohol tahsil of Solapur district and Karjat and Pathardi tahsils of Ahmednagar district. For the study 18 farmers were selected from every village by using proportionate random sampling procedure. Thus, total 144 representative farmers were selected from eight selected villages in these four tahsils of Ahmednagar and Solapur districts. The data were collected through specially developed interview schedule; thereafter the data were analyzed, tabulated and interpreted with suitable statistical instruments like frequency, average, arbitrary method and correlation coefficient.

Measurement of the Attitude

In the present study, attitude has been operationalized as the degree of positive or negative relation of respondent mind towards the farm implements. The content of attitude scale was composed of statement called items and the respondents were asked to react spontaneously to each item in the scale. Their responses, in the form of reactions will be rated on five point continuum viz., strongly agree**,** agree, undecided, disagree and strongly disagree with the score of 5, 4, 3, 2 and 1 respectively for the positive statements and the score of 1,2,3,4 and 5 respectively for negative statements.

The attitude score on this ten item scale ranged between 10 (minimum) and 50 (maximum). Further, respondents were grouped into five categories on the basis of minimum and maximum obtainable score by using arbitrary method and attitude level is worked out.

RESULTS & DISCUSSION

I. Attitude of rainfed area farmers towards the farm implements

Although the respondents selected under study possessed the various farm implements and machineries, it was thought appropriate to understand respondent's attitude towards mechanization as a whole. Distribution of the respondents by their attitude towards improved farm implements in rainfed area is presented in Table 1.

Table 1. Distribution of the respondents according to attitude about farm implements

Sl. No.	Attitude level of respondents	Rainfed Area (N = 144)	
		Frequency	Per cent
1.	Highly Favourable (43 to 50)	21	14.58
2.	Favourable (35 to 42)	107	74.31
3.	Less favourable / Moderate (27 to 34)	16	11.11
4.	Unfavourable (19 to 26)	0	0.00
5.	Highly unfavourable (10 to 18)	0	0.00
	Total	**144**	**100.00**

(Figures in the parentheses indicate percentages)

**** Part of Ph.D. Research of first / senior author**

From Table 1 it is revealed that, in rainfed area about three fourth (74.31 %) of the respondents were having favourable attitude towards the farm implements followed by highly favourable attitude (14.58 %). While few respondents (11.11 %) having less favourable / moderate attitude towards the farm implements. This may be because of in rainfed area the showers are very erratic and in such conditions the farm implements help in performing farm operations speedily, efficiently, uniformly so that there will be minimum loss and maximum utilization of available moisture. Also the farm implements helps in relieving the farmers from the drudgery of physical work. Therefore, not a single respondent was found in highly unfavourable and highly unfavourable category of attitude.

Besides these categories of attitude, an attempt has been made to place the respondents as per the statement wise attitude score and presented in five point continuum i.e. strongly agree, agree, undecided, disagree, strongly disagree. The statement wise attitude score distribution is presented in Table 2.

II. Statement wise distribution of respondents according to their responses of attitude towards farm mechanization

Table 2. Statement wise distribution of respondents according to their responses of attitude towards farm mechanization

Sr. No.	Statements	Respondents (N = 144)				
		SA	A	UD	DA	SDA
1	Improved farm implements save much time and labour	89 (61.81)	52 (36.11)	3 2.08)	0 (0.00)	0 (0.00)
2	Improved farm implements cuts the weed and turn them under the soil making the field quite clean	24 (16.67)	117 (81.25)	3 (2.08)	0 (0.00)	0 (0.00)
3	It is more difficult to handle improved farm implements as compared to traditional farm implements	1 (0.69)	10 (6.94)	38 (26.39)	86 (59.72)	9 (6.25)
4	Improved farm implements render the soil poor because it turns over the fertile surface soil to the subsurface and the unfertile subsurface soil to the surface.	3 (2.08)	2 (1.39)	35 (24.31)	90 (62.50)	11 (7.64)
5	Improved farm implements make a good soil tilth	33 (22.92)	90 (62.50)	17 (11.81)	4 (2.78)	0 (0.00)
6	Improved farm implements are beneficial only to big cultivators and not to small ones	2 (1.39)	17 (11.81)	15 (10.42)	96 (66.67)	14 (9.72)
7	Improved farm implements are not costly as compared to their benefits	18 (12.50)	97 (67.36)	18 (12.50)	11 (7.64)	0 (0.00)
8	There are large limitations on use of improved farm implements	4 (2.78)	19 (13.19)	32 (22.22)	77 (53.47)	12 (8.33)
9	Improved farm implements require very high draft and make the bullocks too weak	5 (3.47)	8 (5.56)	15 (10.42)	88 (61.11)	28 (19.44)
10	Use of improved farm implements increases production	25 (17.36)	111 (77.08)	5 (3.47)	3 (2.08)	0 (0.00)

(Figures in the parentheses indicate percentage)

From Table 2, it is revealed that in overall very large majority (97.92 %) of the respondents were agreed (i.e. strongly agreed and agreed) with the first two statement i.e. farm implement save much time and labour and farm implements cuts the weed and turn them under the soil making the field quite clean. Followed by statement, use of improved farm implements increases production (94.44 %), improved farm implements make a good soil tilth (85.42 %).

At the same time very few respondents were agreed to statement that, improved farm implements render the soil poor because it turns over the fertile surface

soil to the subsurface and the unfertile subsurface soil to the surface (3.47 %) and it is more difficult to handle improved farm implements as compared to traditional farm implements (7.63). Followed by, statement that improved farm implements require very high draft and make the bullocks too weak (9.03 %).

Similarly when focused to dis-agreeness of respondents, Table 2 revealed that majority of respondent disagreed (i.e. disagree, strongly disagree) the statements number nine i.e. improved farm implements require very high draft and make the bullocks too weak (80.55 %). Followed by statement six i.e. improved farm implements are beneficial only to big cultivators and not to small ones (76.39 %) then statement that improved farm implements render the soil poor because it turns over the fertile surface soil to the subsurface and the unfertile subsurface soil to the surface (70.14 %) and statement that, it is more difficult to handle improved farm implements as compared to traditional farm implements (65.97 %)

III. Relationship of farmers' attitude with knowledge and utilization of farm implements

The correlation coefficient between attitude of the rainfed farmers with knowledge level and utilization index of the farm implements is presented in Table 3.

It is evident from Table 3 that, there was a significant positive relationship between 'attitude' and 'knowledge level' of respondent farmers in rainfed area (r = 0.195*). The study also revealed that there was no significant relationship between the 'utilization index' of respondent farmers in rainfed area with the 'attitude'. The finding is in contradictory with the findings of Jalak (2002) but in line with the Patil *et al.* (2014).

Table 3: Correlation coefficient between attitude of the rainfed farmers with knowledge level and utilization index of the farm implements

Sl. No.	Dependant Variables	Correlation Coefficient ('r' value)
1.	Knowledge level	0.195*
2.	Utilization index	0.143 ^{NS}

**Significant at 0.01 level of probability, *Significant at 0.05 level of probability and NS: Non-Significant

CONCLUSION

Findings help to conclude that majority of rainfed area farmers were having favorable to highly favorable attitude towards the farm implements. From the study it is also concluded that, there was significant positive relationship between 'attitude' and 'knowledge level' of respondent farmers in rainfed area. But at the same time 'utilization index' of respondent farmers in rainfed area have been found non-significant with the 'attitude'. This is may be because of farmers respondent possess knowledge of farm implement but at the same time many of them din't have their own farm implements still they were using implements on hire or share basis.

This is a good signs that farmers exhibited a favorable attitude towards use of farm implements also exhibited a positive relationship with knowledge and attitude towards use of farm implements and therefore, can be taken into consideration by the decision makers for policy making and extension agencies for effective dissemination and adoption of improved farm implements in rainfed area.

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RESEARCH ARTICLE

Role of KVK in Assessing the Index Level of Extension Personnel's belongs to Allied Department of M.P.

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ABSTRACT

India's extension system is the largest in the world. Extension personnel's are directing responsible for agricultural extension system. They reach to farmer with techniques, inputs, credit distribution, soil testing etc. Unified extension system consists of training and visit under which all the extension activities of agriculture are solder by agricultural extension workers, over whom administrative control is exercised by the Department of Agriculture. In agriculture, knowledge and decision making capacity determine the efficient utilization of production factors viz; soil, water, labour and capital, Agricultural extension is responsible in formulating and disseminating knowledge, and teaching farmers to be competent decision makers. The success of most of the agricultural development project is dependent on agricultural extension system. Madhya Pradesh State department of agriculture and State agriculture Universities is considered one of the biggest organisational setup in the field of agriculture research, education and extension. It has a vast network of research institutions, Colleges, Krishi Vigyan Kendras, FTC, Extensional Personnel's of State department of agriculture, horticulture and seed certification institution spread up in the state. Performance and effectiveness of the extension personnel's is important for the develop the further extension based development programme. Keeping this in view a study was designed on the basis of their performance those were engaged in different extension work at district level. Hence, this study was conducted with keeping the fallowing objectives...To study relation between their personal characters with their respective service. To study performance and effectiveness of a particular extension personnel's and to determine the suggestion towards improve their quality work and stress management.

***Keywords**: Performance and effectiveness, Krishi Vigyan Kendras*

METHODOLOGY

Sample Selection: The study was conducted at KVK Ujjain in which extension personnel's of agriculture, horticulture and seed certification department were invited. Total 66 respondents were purposively selected those who participated in different training programme of KVK.

Questionnaire : A preplanned questionnaire prepared and distributed to the selected officers. In the questionnaire all the aspectes were covere regarding their personal attiutde, behaviour and nature of performing the work at field level.

Method of analysis: A five point scale was used in assessing the data in which total 15 points were covered. Assessment of agricultural officers is crucial to understand individual effectiveness, self motivate employees and to formulate strategies. Individual effect is a net result of the organization. To assess the scale of individual effect designed by Human Resource Department (HRD). Total 15 statement codes under scale and according to their nature or habits give the number from 0 to 5. The details scale is under as;

i- Effectiveness: Having an effect able to bring about the result intended. Effectiveness a striking impression.

ii- **Insensitive:** Sensitive is a psychological character of human that means quickly or easily receiving impressions; Insensitive is just opposite.

Egocentric: A person who think about himself only.

iii- **Self Disclosure**: Self-disclosure is a process of communication by which one person reveals information about himself or herself.

iv- **Secretive**: "A person who does not share his problem with others. The one who tries to keep all his talks as a secret.

v- **Ineffective**: A person who does not leave his/her impression on others.

vi- **Dogmatic**: A person who is not rational. Making purely personal statements as if they were dogmatic.

vii- **Task obsessed**: A person who thinks about himself only.

viii- **Lone-empathic**: A person who is touched by emotions of others.

ix- **Effective**: The person who leave impression on others, having an effect, able to bring about the result what he intended.

x- **Openness feedback**: Ready to grasp.

xi- **Perceptiveness:** Ready to grasp to other perception, perception; process by which we become aware of changes. Perceptiveness connected with perception, able to perceive.

RESULTS AND DISCUSSION

According to the department wise the details of selected respondents was depicted in table 1.

Table 1: Respondents according to their department

Sr. No	Department	Number & Percentage
1	Agriculture	32 (48.48%)
2	Horticulture	12 (18.18%)
3	Seed Certification	22 (33.34%)
	Total	**66 (100.00%)**

It was clear that out of 66 the majority of the respondents (48.48 %)were from agriculture department followed by 33.34% of respondents from seed certification department and only 18.18% of respondents were from the horticulture department.

Data in table 2 presented the distribution of respondents according to their respective designation.

Table 2: Respondents according to their Post/Designation

Sr. No	Designation	Number & Percentage
1	RAEO	22 (33.33%)
2	SADO	09 (13.63%)
3	SHDO	03 (4.54%)
4	RHEO	04 (6.06%
5	ASCO	22 (33.33%)
6	Technical Assistant	02 (3.03%)
7	Assistant Grade	04 (6.07%)
	Total	**66(100.00%)**

It was shown from the table that 33.33% of respondents were RAEO and ASCO. Further it was seen that 13.63% of respondents were SADO and 6.06 % of respondents were RHEO and Assistant grade. Around 4.54% of respondents were SHDO and only 3.03 % of respondents were Technical assistant.

Table 3: Respondents according to their Age

Sr . No	Category	Number & Percentage
1	20-30 years	12 (18.18%)
2	31-40 years	16 (24.24%)
3	41-50 years	25 (37.87%)
4	Above 50 years	13 (19.69%)
	Total	**66(100.00%)**

Table 3 indicated distribution of respondents according to their ages. It was shown majority of the respondents (37.87%) falls between 41 to 50 years. About 24.24% of respondents are between 31-40 years followed by 19.69% of respondents above 50 years and only 18.18 % of respondents are between 20 to 30 years which was the youngster group among selected respondents.

Table 4 indicated distribution of respondents according to their educational level. It was observed majority of respondents (51.51%) have completed M.Sc (Ag) whereas 18.18 % of respondents have pass out B.A. followed by 15.15% with B.Sc (Ag) and only 7.58% are MA and Higher Secondary pass outs.

Table 4: Respondents according to their Education

Sr. No	Education level	Number & Percentage
1	M.Sc.(Ag)	34 (51.51%)
2	M.A.	05 (7.58%)
3	Higher Secondary	05 (7.58%)
	Total	**66(100.00%)**

Table 5: Respondents according to their experience

Sr. No	Individual Effective test	Numbers
1	Effectiveness	29 (43.93)
2	Insensitive	05 (7.57)
3	Ego-centric	05 (7.57)
4	Dogmatic	06 (9.09)
5	Secretive	07 (10.6)
6	Obsessed	05 (7.57)
7	Lone empathic	06 (9.09)
8	In-effective	03 (4.58)
	Total	**66(100.00%)**

Table 5 indicated distribution of respondents according to their experience. It was clear from the table 42.43% of respondents had experience of 21 to 30 years followed by 25.75% of respondents had experience of 1 to 5 years. 22.73 % of respondents have experience of 11 to 20 years and 6.06% of respondents have 6 to 10 years of experience. Only 3.03% of respondents had experience above 31 years which was the highest experience among the selected participants.

Table 6. Distribution of the Respondents according to their attitude regarding statements

Sr. No	Experience	Number & percentage
1	1 – 5 Years	17 (25.75%)
2	6 – 10 Years	04 (6.06%)
3	11 – 20 Years	15 (22.73%)
4	21 – 30 Years	28 (42.43%)
5	Above 31 Years	02 (3.03%)
	Total	**66(100.00%)**

Attitude of the respondents was depicted in table 6 in which three parameters were assessed viz. Self Disclosure, Openness to feedback and perceptiveness.It was observed that 63.63% of respondents have high level of self disclosure and 24% have low level of self disclosure. Further it was seen that 72.72% of respondents have high level of openness feedback and 27.28% have low level of openness feedback. Regarding perceptiveness 83.33% have high level and 16.67 % have low level of perceptiveness.

Table 7. Respondents according to their attitude regarding Individual Effective test

Sr. No	Individual Effective test	Numbers
1	Effectiveness	29 (43.93)
2	Insensitive	05 (7.57)
3	Ego-centric	05 (7.57)
4	Dogmatic	06 (9.09)
5	Secretive	07 (10.6)
6	Obsessed	05 (7.57)
7	Lone empathic	06 (9.09)
8	In-effective	03 (4.58)
	Total	**66(100.00%)**

Table 7 indicates attitude of respondents regarding individual effective test in which total eight points were covered those were Effectiveness, Insensitive, Ego-centric, Dogmatic, Secretive, Obsessed, Lone Empathic and in -effective. As per the result 43.93per cent of respondents were found to be effective whereas 10.6per cent of respondents were dwelt in secretive category and 9.09 per cent were dogmatic and lone empathic. Further it was seen from the result that 7.57 per cent of respondents were insensitive, egocentric and obsessed and only 4.58 % of respondents are ineffective. It was clear from the finding that maximum in-service personnel's were effectively working at field level.

Suggestions and Implementation based on the feedback:

The study was clearly showed that the develop effectiveness and performance of the extension personnel's is to be required. The following suggestions were observed during the study;

a. Increase involvement of field staff during the preparation of extension programme.
b. Improved self-confidence through develop decision making capacity into extension personnel's.
c. Motivation, stress management and time management training programmes should be

continue organised for the develop of preference of extension personnel's.

d. Budget and provision of individual programme should clear so that transparency is to be maintained which will help to boost up the confidence in the extension personnel's.
e. Organisation of block level, regional level and district level workshop, conferences and trainings on human values and professional ethics is to be required.
f. Regular review of the assigned work, work load and priorities of the work by the higher authorities is must.
g. Facilities to be provided to the field workers.

CONCLUSION

Extension systems have a major impact on the sustainability of Madhya Pradesh agriculture and allied sector. It is a difficult task, while executing extension work at field level. Farming is highly risky and farmers were faced the problems hence the extension personnel has to be highly dedicated and must be deeply involved in farmer community. So that he may win the confidence of the farmers by living and working with them. He must be well acquainted with the site specific reasons and constraints for their happiness and sorrows along with their traditional wisdom to fight against the risks in farming. For effective and smooth working the all facilities viz. remote area allowance, Cell phone expenses, POL and sustainable incentive must be provided for their hard and dedicated service to the farming community of Madhya Pradesh state.

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RESEARCH ARTICLE

Adoption of Bio fertilizers among the Farmers

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ABSTRACT

The indiscriminate use of chemical fertilizers, however, has resulted in deterioration of soil fertility, disturbed the life cycle of microbes, led to reduction in productivity, high infestation by diseases, insect pests and growth of weeds. therefore, biofertilizers emerged as an important and promising component of Integrated Nutrient Management System. The farmers are required to posse information about various biofertilizers and their associated practices. The study was undertaken in Katol Panchayat Samiti of Nagpur district. From Katol Panchayat Samiti 10 villages were selected by simple random sampling method. Out of 600 farmers of this Panchayat Samiti which was supplied with the biofertilizers, only 100 farmers were selected by proportionate random sampling from selected 10 villages. Majority of the farmers had high medium level of adoption.Majority of the farmers had high medium level of adoption. Majority of them had highly favorable view towards attributes of biofertilizers and were medium in use of biofertilizers.

Key words: *bio fertilizer, adoption, productivity*

Agriculture production depends upon availability and use of quality and quantity of farm inputs. The chemical fertilizers are supposed to be essential inputs for boosting up of production of hybrids and high yielding crop varieties. It has played a significant role in increasing agricultural production in the country since 'Green Revolution'. The continuous use of chemical fertilizers however, has deteriorated the soil fertility, destroyed soil microbial activity, disturbed environmental balance and ecological soundness. This therefore, indicates a dire need to use such fertilizers that are eco-friendly, maintain soil fertility and increase crop production. The yield levels of crop per unit area in the country are much lower than expected one. The gap has to be minimized by increasing crop yields through adoption of new technology. Biofertilizers is one of the recently developed and introduced technologies. It has not yet reached to the farmers in meaningful way. Biofertilizers have potential to fix 20 to 2000 kg nitrogen per hectare/year and increase crop yield potential by 10 to 30 per cent. Besides, they help in soil improvement and enrichment. Indian economy basically dependent on agriculture and nearly two third populations is sustained by it. Agriculture conditions are predominantly influenced by strong inclination of farmers towards use of traditional methods of cultivation. Researches and policy makers considered it as a vital impediment in enhancing and transfer of improved cultivation techniques amongst farmers. The efforts were mainly focused on increasing area coverage under agriculture innovation and scientific methods of cultivation of quicker pave. The speedy adoption of improved agriculture techniques is most important for enhancing agricultural production. Increasing attention is being paid to this renewable source of plant nutrient because of depleting feedback of fossile fuel availability, high cost of fertilizers and their adverse effect due to its limited use. The government of Maharashtra is one step ahead to popularize biofertilizers. To promote the use of this new technology provision is made by the government to distribute the packets of biofertilizers among farmers on 50 per cent subsidy basis. The present study was therefore planned with the following specific objectives. To study the extent of adoption of biofertilizers by the farmers

METHODOLOGY

The present study was carried out in Katol Panchayat Samiti of Nagpur district of Vidarbha region of Maharashtra state. This Panchayat Samiti is situated on North-West side of Nagpur at a distance of 60 km. For the present study the exploratory design of social research was used. Katol Panchayat Samiti was purposively selected from Nagpur district. Katol Panchayat Samiti consist of 187 villages among these 10 villages were selected by simple random sampling method. The villages are, Metpanjara, Lingapardi, Sirsawadi, Sawargaon, Sonuli, Junona, Paradsinga, Khandala, Sabkund, and Ridhora

RESULT AND DISCUSSION

1. Adoption of bio fertilizers :

Adoption shows the present status of actual use of bio-fertilizers by the farmers for inoculating to different crops. The distribution of the farmers according to their level of adoption of bio-fertilizers presented in Table 1. It reveals that (16.00 %) of the farmers were included under low category of adoption of bio-fertilizers. The farmer belongings to medium categories of adoption were found (54.00 %). Whereas, only (30.00 %) of the farmers had high level of adoption of bio-fertilizers. It leads to approval of the hypothesis that the farmers did not adopted various practices associated with bio-fertilizers majority of the respondents has low adoption (16.00 %) of practices of bio-fertilizers. Similar finding were reported by Marathe (2004).

Table 1: Distribution of respondents according to their adoption level of practices of biofertilizers

Sr. No.	Adoption Level	Respondents (N=100)	
		Frequency	Percentage
1	Low	16	16.00
2	Medium	54	54.00
3	High	**30**	**30.00**

It could thus be made out that the farmers were low in adoption of bio-fertilizers. The null hypothesis is, therefore, proved. Thus there exists a gap in adoption of bio-fertilizers practices by the farmers. The findings, therefore, pointed out that inadequate and sporadic efforts were made in popularizing the low cost technology to the door step of the farmer concerted efforts on the part of extension agency to popularize this technology through various means particularly through mass campaign therefore seems to be appropriate in this direction. The adoption of various bio-fertilizers by the farmers was ascertained and reported in Table 2.

Table 2 :- Distribution of the farmers according to their adoption of various bio-fertilizers.

Sr. No.	Biofertilizers	Respondents (N=100)	
		Frequency	Percentage
1	Rhizobium	**91**	**91.00**
2	Azotobacter	35	35.00
3	Azospirillum	03	03.00
4	Phosphate solubalising bacteria	09	09.00

(Sum of the percentage is more than 100 because of multiple responses)

It could be seen from Table 2 that a great majority of the respondents 91.00 per cent used the *Rhizobium* for inoculation to different pulse crops. A sizeable percentage of the farmers 35.00 per cent were found to be using Azotobacter for cereal crops. This was followed, by 09.00 per cent of respondents who used PSB to different crops. It is discouraging to note that very few respondents 03.00 per cent were used *Azospirillum* biofertilizer. Near about 17.00 per cent of the farmers had used composting biofertilizers. Thus, efforts should be made by the extension agencies that along with the *Rhizobium* and *Azotobacter*, farmers should also be motivated to use biofertilizer viz; *Azospirillum* and composting biofertilizers. It is necessary to make a propaganda about these biofertilizers, as they are low cost, local, econfriendly and sustainable.

The adoption of various practices connected with use of biofertilizers by the respondent was further ascertained and the same have been reported in Table 3. It is evident from the distribution in Table 3, that 90.00 per cent of the respondents used biofertilizers only for the specified crops. Further, it was noted that majority of the respondent had adopted practices like, drying of the inoculated seeds under shade 65.00 per cent, used jaggery as sticking agent (86.00 %), used 250g *Rhizobium* / *Azotobacter* for 10 kg seeds 86.00 per cent, expiry date of biofertilizers before use 83.00 per cent, considering incompatibility of biofertilizers with

the chemical fertilizers 66.00 per cent and storing of biofertilizers in cool place 65.00 per cent. It is also note that 11.00 per cent of the respondents use PSB and *Rhizobium* in 1:1 proportion as per the recommendation. This was followed by 04.00 per cent of the respondents use 1 kg of *Azospirillum* in 40 lit. Water for 1 ha area (90.00%) and 2 kg of PSB with 20 kg FYM for 1 ha area (76.00%).

Table-3: Distribution of respondents according to practice wise adoption of various biofertilizers;

Sr. No	Bio fertilizer practices	Adoption (N=100)		
		As per recommendation	Not as per recommendation	Non adoption
A)	**Methods of application of biofertilizers**			
1	Recommended quantity of *Rhizobium* and *Azotobacter* (250 g/10 kg of seeds)	**86 (86.00)**	08 (08.00)	06 (06.00)
2	Recommended quantity of *Azospirillum* (1 kg in 40 lit. water for 1 ha. Area)	04 (04.00)	06 (06.00)	90 (90.00)
3	Recommended quantity of PSB (2 kg in 20 kg FYM for 1 ha. Area)	18 (18.00)	06 (06.00)	76 (76.00)
B)	**Precaution to be taken while use of biofertilizers**			
1	Consideration of expiry date of biofertilizers (Six months)	**83 (83.00)**	05 (05.00)	12 (12.00)
2	Use of biofertilizers only for specified crops	**90 (90.00)**	06 (06.00)	04 (04.00)
3	Storage of biofertilizers in cool and dry place	65 (65.00)	25 (25.00)	10 (10.00)
4	Use of jaggery as sticking agent	**86 (86.00)**	04 (04.00)	10 (10.00)
5	Drying of inoculated seeds under shade	**95 (95.00)**	03 (03.00)	02 (02.00)
6	Period within which inoculated seeds used for sowing (24 hrs.)	**65 (65.00)**	30 (30.00)	05 (05.00)
7	Incompatibility of biofertilizers and chemical fertilizers	**66 (66.00)**	10 (10.00)	24 (24.00)
8	Proportion of use of PSB and *Rhizobium* (1:1)	11 (11.00)	19 (19.00)	70 (70.00)

CONCLUSION

The reasons for non adoption of composting biofertilizers, recommended quantity of *Azospirillum* and PSB might be the lack of awareness about these biofertilizers. The farmers should therefore, should be equipped with detailed knowledge about these biofertilizers. They should need to be convinced about the effectiveness of biofertilizers in crop production through organization of demonstrations and meetings. Further, with a view to boost up the adoption of biofertilizers, it is essential to apply the different biofertilizers in time and that too at village level. The majority of the respondents (38.00 %) had medium level of innovativeness with regards to adoption of biofertilizers. Majority of the farmers had medium level of adoption of biofertilizers.

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RESEARCH ARTICLE

Technological Constraints in Mango Production

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ABSTRACT

The Indian scenario of horticulture indicates that India ranks first among world's mango producing countries. Mango is grown over an area of 2.51 million hectares. The production of mango in India is 18.43 million tonnes (Indian Horticulture Database, 2014- 15). Irrespective to the reality that India is having a comparative advantage over other mango producing countries in terms of total production still the productivity (7.2 tonnes/ha) continues to be low. The productivity of mango in Maharashtra (1.3 tonnes/ha) also tends to be very low as compare to other major mango growing states in India. Hence, the present study was conducted to study the technological constraints in mango production and to obtain their suggestions to overcome. The study revealed that major constraints faced by the mango growers were high susceptibility of mango for pests and diseases followed by unavailability of skilled labours, sudden climatic changes, high perishable nature of mango, alternate bearing, occurrence of spongy tissue, long juvenile period, lack of knowledge regarding mango export norms.

Keywords: *constraints, mango, technology and production*

METHODOLOGY

The major Alphonso growing districts in Maharashtra state are Ratnagiri, Raigad, Thane and Sindhudurg. The present study was conducted in Sindhudurg district of Maharashtra state which has about 31,363 ha. area under mango cultivation. Three tahsils viz; Deogad (12,190 ha), Malvan (5,290 ha) and Vengurle (3,815 ha) having highest area under mango cultivation were selected for the study. Five villages from each tahsil were selected considering the maximum area under mango cultivation based on the information obtained from the Taluka Agriculture Officer. Thus, in all 15 villages were selected. The list of mango growers having more than 100 bearing mango trees were collected from each selected village. 8 farmers were randomly selected from each village. A total sample of 120 mango growers was selected for the study. An exploratory design of social research was used for the present study.

RESULTS AND DISCUSSION

Socio-economic characteristics of the mango growers

The data given in table 1 revealed that more than half (56.66%) of the mango growers were belonging to middle age group. The data also depicted that more than half (51.67 %) of the mango growers belonging to education up to higher secondary level. Near about same percent of mango growers had small (37.50%) and semi medium (36.67%) size of land holdings whereas mango growers had medium (62.50%) area under mango i.e. 1.0 to 2.5 ha. About 52.50 % mango growers had annual income between Rs 1.00 to Rs 2.00 lakh. Near about two-third of the mango growers (65.83%) had income generated through mango i.e. Rs. 27,600 to Rs. 94, 484. Majority of the mango growers (70.83 %) used medium sources of information whereas, more than three- fourth (76.67 %) of the respondents had medium extension contacts.

Table 1: Distribution of the mango growers according to Socio-economic characteristics of the mango growers

Sr No	Category	Respondents (N= 120)	
		Nos.	Per cent
1	**Age**		
	Young (Up to 35 Years)	34	28.33
	Middle (36 to 55 Years)	68	56.67
	Old (56 and above)	18	15.00
2	**Education Level**		
	Illiterate	0	00.00
	Primary Level (1st to 7th std.)	12	10.00
	Secondary Level (8th to 10th)	17	14.17
	Higher Secondary Level (11th and 12th)	62	51.67
	Graduation Level (Bachelor's Degree)	25	20.83
	Post Graduation (Master's Degree)	4	3.333
3	**Size of Land Holding**		
	Marginal (0.01 to 1.00 ha)	0	00.00
	Small (1.01 to 2.00 ha)	45	37.50
	Semi- medium (2.01 to 4.00 ha)	44	36.67
	Medium (4.01 to 6.00 ha)	25	20.83
	Large (6.01 and above)	6	05.00
4	**Area Under Mango Cultivation**		
	Small (Up to 1.00 ha)	2	01.67
	Medium (1.01 to 2.5 ha)	75	62.50
	Large (2.51ha and above)	43	35.83
5	**Annual Income**		
	Up to Rs. 1,00,000	12	10.00
	Rs. 1,00,001 to Rs. 2,00,000	63	52.50
	Rs. 2,00,001 to Rs. 4,00,000	32	26.67
	Rs. 4,00,001 and above	13	10.83
6	**Income Generated through Mango Production**		
	Low (Up to Rs. 27,599/-)	12	10.00
	Medium (` Rs. 27,600- Rs. 94,484/-)	79	65.83
	High (Rs. 94,485/- and above)	29	24.17
7	**Sources of Information**		
	Low (Up to 12)	13	10.83
	Medium (13- 21)	85	70.83
	High (22 and above)	22	18.33
8	**Extension Contact**		
	Low (Up to 3)	7	5.833
	Medium (4- 8)	92	76.67
	High (9 and above)	21	17.50

Technological constraints faced by mango growers

The data regarding technological constraints faced by the mango growers was depicted in table 2. As mango is susceptible for various pests like mango hoppers, fruit fly, stem borer etc. and diseases like powdery mildew, anthracnose etc., hence all the mango growers (100.00 %) have reported infestation of pests and incidence of diseases as major constraint. The second major constraint faced by all mango growers (100.00 %) was unavailability of skilled labours. As we know that climate change is major problem in agriculture all over the world which causes failure of most of the crops. Hence, sudden climatic change during the season of mango like heavy rains, winds, fog, extreme cold etc. at the time of flowering and fruit setting was also one of the important constraints reported by 100.00 per cent of the mango growers. When yield of mango is satisfactory, losses of fruit due to its highly perishable nature was the major constraint faced by majority (90.83 %) of the mango growers.

Alternate bearing is physiological characteristic of Alphonso variety of mango, this problem of alternate bearing was reported by more than three-fourth (76.67 %) of the mango growers. Spongy tissue in mango is highly observed physiological disorder in mango was reported as major constraint by three- fourth (75.00 %) of the respondents. As juvenile period i.e. unproductive period in mango from planting to regular flowering is long. Hence, 64.17 per cent of the mango growers had reported this as major constraint.

Mango has high value in international market which can help farmers to earn more profit as compare to domestic market but, lack of knowledge regarding mango export norms like Eurep gap certification norms and APEDA protocols etc. reported as hindrance in mango export by the three-fifth (60.00 %) of the mango growers. For control of different pest and diseases in mango, it is necessary to have scientific knowledge regarding use of pesticides and fungicides but, lack of knowledge regarding these plant protection chemicals was one of constraint faced by 47.50 per

cent of the mango growers. 37.50 per cent of the mango growers faced the problem regarding unavailability of plant protection chemicals on time.

Some horticultural practices in mango like grafting, training, pruning etc require more skills but, lack of such skill was one of the constraints faced by 19.17 per cent of the mango growers. It has been also reported that 12. 50 per cent of the mango growers have faced problem regarding lack of irrigation facilities.

Table 2: Technological constraints faced by mango growers

Sr. No	Technological Constraints	Respondents (n= 120)	
		Nos.	Per cent
1	High susceptibility of mango for pests and diseases	120	100.00
2	Unavailability of skilled labours	120	100.00
3	Sudden climatic changes	120	100.00
4	High perishable nature of mango	109	90.83
5	Alternate bearing	92	76.67
6	Occurrence of spongy tissue	90	75.00
7	Long juvenile period	77	64.17
8	Lack of knowledge regarding mango export norms	72	60.00
9	Lack of knowledge regarding use of plant protection chemicals	57	47.50
10	Unavailability of plant protection chemicals and equipments on time	45	37.50
11	Lack of skill in performing horticultural practices	23	19.17
12	Lack of irrigation facilities	15	12.50

Suggestions obtained from mango growers to overcome the constraints

To overcome the various constraints faced by mango growers it was suggested that proper advisory services should be provided regarding infestation of pests, infection of diseases (95.83%) as well as sudden climatic changes. It was also suggested by 93.33 per cent of the respondents to provide recovery amount on time when crop failures due climate change by the state Government. To overcome the constraints regarding loss of mango during and after ripening, it was suggested by majority (84.16 %) of the mango growers that proper storage facilities should be provided at the place of production as well as marketing like APMC's. More than three- fifth (61.66 %) of the mango growers had suggested that proper research should be conducted to overcome the constraint regarding spongy tissue. It was suggested by 60.00 per cent of the mango growers that awareness should be created regarding export norms like Eurep gap certification norms and APEDA protocols etc. so that mango can be exported by most of the farmers in Maharashtra state followed by execution of an intensive training programme in the mango should be conducted by government organizations and non-government organizations to overcome different constraints regarding knowledge and skills in mango cultivation (45.83 %).

CONCLUSION

India had tremendous potential to produce mango, but irrespective of the reality in case of alphonso mango there are various technological constraints faced by the mango growers. Hence, there net income through mango is less as compare to other fruit crops. Government should execute proper strategies to overcome these problems so that farmers can produce high quality alphonso mango and maximize their profit.

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RESEARCH ARTICLE

Constraints Faced by Tribal Farmers in Getting Benefits of Check Dam

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ABSTRACT

The study was carried out in Dahod district of Gujarat state to identify the various constraints faced by tribal farmers in getting benefits of check dam. A random sample of 60 beneficiary farmers was selected and the constraints faced by them in getting benefits of check dam were studied. The result of the study depicted that problems in supply of water due to uneven topography of land, Shortage of irrigation water at critical stage of crop, Time arrangement is difficult when water supply at night were perceived as a major constraints faced by beneficiary farmers.

Keywords: *Constraints, Check dam.*

Check dams are a sustainable source of water. Small check dams which built across streams to prevent the seasonal water from flowing away into the sea. Check dams are a micro level treatment and their size and their characteristics are placing specific. A series of check dams built on a stream help conserve a phenomenal amount of water, and they are a prime example of. Thinking globally and acting locally. Irrigation is the most important natural resources of a country that decides socio-techno-economic development of a civilization. The impact of irrigation is all pervading as it leads to change in cropping pattern, increase yield rates and labour utilization and in the ultimate analysis, brings prosperity to the area. The irrigation through check dam results in increasing production and ultimately resulted in rising of socio-techno-economic status of farmer in tribal areas. There may be many constraints on the path of farmers in getting benefits of check dam. If such constraints are identified, corrective measures can be taken up. With this in view, the farmers were requested to express their constraints in getting benefits of check dam.

Objectives of the study are as follows-

1. To study the constraints faced by the tribal farmers in getting benefits of the check dam.
2. To seek the suggestions to overcome the constraints faced by farmers in getting benefits of check dam.

METHODOLOGY

The present investigation was undertaken in Dahod district because in this district maximum tribal farmers are getting benefit of check dam in the Gujarat state. Dahod district has eight talukas, out of eight talukas two talukas Dahod and Zalod were selected purposively. From each selected taluka, six villages were selected purposively. Thus, total twelve villages were selected. From each selected village ten farmers who are getting benefit of check dam and ten farmers who are not getting benefit of check dam were randomly selected for the study. Thus, total 120 farmers (60 beneficiaries and 60 non-beneficiaries) were selected for the study. For ascertaining the constraints and suggestions, farmers were asked open ended question to state the difficulties faced by them in getting benefits of check dam. The intensity of each constraint was computed in percentage according to the frequency of the farmers against the constraints and finally the rank was assigned on the basis of the percentage.

RESULTS AND DISCUSSION

Constraints mean the difficulties or restraints faced by the beneficiary farmers in getting benefits of check dam that have never end. However, they can be minimized. The respondents were requested to express the constraints faced by them in getting benefits of check dam. Frequency and percentage for each constraints were calculated and on the basis of that, the constraints were assigned ranked and are presented in Table 1.

Table 1: Distribution of the respondents according to their problems in getting benefits of check dam (n= 60)

Sr. No.	Constraints	Number	Per cent	Rank
1	Problems in supply of water due to uneven topography of land.	58	96.66	I
2	Shortage of irrigation water at critical stage of crop.	57	95.00	II
3	Time arrangement is difficult when water supply at night time.	55	91.66	III
4	Problems of labour to cover entire field at night time.	52	86.66	IV
5	Due to weak financial condition not able to afford the charges of irrigation water.	48	80.00	V
6	Long distance from the field.	35	58.33	VI
7	High rate of electricity.	30	50.00	VII
8	At the night time trace passes break water course.	27	45.00	VIII
9	Lack of coordination between field staff and farmers.	19	31.66	IX
10	Irregular supply of electricity.	10	16.66	X

As seen in Table 1, the major important constraints faced by the farmers in getting benefits of check dam were "Problems in supply of water due to uneven topography of land (96.66 per cent)","Shortage of irrigation water at critical stage of crop (95.00 per cent)", "Time arrangement is difficult when water supply at night time (91.66 per cent)", "Problems of labour to cover entire field at night time (86.66 per cent)", "Due to weak financial condition not able to afford the charges of irrigation water (80.00 per cent)","Long distance from the field (58.33 per cent)","High rate of electricity (50.00 per cent)", "At the night time trace passes break water course (45.00 per cent)","Lack of coordination between field staff and farmers (31.66 per cent)", "Irregular supply of electricity (16.66 per cent)", respectively.

Table 2: Distribution of the respondents according to their suggestions for getting benefits of check dam

Sr. No.	Suggestions	Number (n=60)	Per cent	Rank
1	Irrigation water should be supplied timely.	49	81.66	I
2	More subsidy should be granted for soil and water conservation works	46	76.66	II
3	Rotation irrigation should be strictly followed.	37	61.66	III
4	Adequate quantity of irrigation water should be supplied.	35	58.33	IV
5	Three phase electricity should be available for more than ten hours daily.	20	33.33	V

The major suggestions endorsed by the farmers to overcome their constraints in getting benefits of check dam were: "Irrigation water should be supplied timely by irrigation department (81.66 per cent)","More subsidy should be granted for soil and water conservation works (76.66 per cent)", "Rotation irrigation should be strictly followed (61.66 per cent)","Adequate quantity of irrigation water should be supplied (58.33 per cent)","Power station should be built to ensure regular supply of electricity (33.33 per cent)", respectively.

CONCLUSION

Major problem faced by the tribal farmers in getting benefits of check dam were "Problems in supply of water due to uneven topography of land", "Shortage of irrigation water at critical stage of crop", "Time arrangement is difficult when water supply at night" and valuable suggestions offered by beneficiary farmers to overcome them "Irrigation water should be supplied timely", "More subsidies should be granted for soil and water conservation works", "Rotation irrigation should be strictly followed".

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RESEARCH ARTICLE

Utility of Broad Bed Furrow Technology Perceived by Soybean Growers

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ABSTRACT

Soybean (Glycine max (L.) Merrill.) is originated in China and it was introduced in India in recent past. It is basically a pulse crop and gained the importance as an oilseed and legume crop as it contains 20 per cent cholesterol free oil. In recent years, it is imperative to improve sowing techniques through preferred seedbed preparation and early crop growth. Sowing techniques and type of seeding machines play an important role in seed placement and seedling emergence which ultimately affect crop growth and crop yield. The selection of suitable planting methods is dependent upon the time of planting, irrigation methods, amount of residue in the field and type of planting machines. The traditional sowing practices followed by farmers in different parts of the country are broadcasting manually, opening furrows by a country plough and dropping seeds in the furrow through a metal funnel attached to a country plough. For sowing small areas, making slits by a stick or tool and dropping seeds by a hand is practiced. All these conventional practices are time consuming and require high seed rate. The broad bed and furrow (BBF) system has been mainly developed at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India. It is a modern version of the very old concept of encouraging controlled surface drainage by forming the soil surface into beds. The crop experiences moisture stress during the dry spell ranging from 15–21 days at any growth stage under rainfed conditions, resulting significant reduction in the yield. The loss in yield can be avoided or minimized if good amount of water is stored in the soil during rainy days and utilized by the crop during moisture stress or dry spell. Studies on soil management for increasing crop production revealed that modification of land configuration such as broad bed furrow, ridges and furrows for soybean in vertisol was superior over flat bed and recommended in watershed development. Government of Maharashtra promotes broad bed and furrow (BBF) technology for soybean cultivation to increase soybean productivity under rainfed condition. During kharif 2014-2015, Government of Maharashtra distributed broad bed furrow planters in the Marathwada region. It is new technology to the soybean growers, hence present study was undertaken to study the utility of broad bed and furrow (BBF) technology as perceived by soybean growers and also find out constraints faced by them in utilization of BBF technology in soybean.

***Key words**: Utility Perception, Broad Bed Furrow, Soybean Growers.*

METHODOLOGY

The present study was conducted in Beed and Parbhani districts of Marathwada region in Maharashtra state. Two talukas *viz.*, Ambajogai and Kejtalukas from Beed district and two talukas viz., Parbhani and Manwat from Parbhani district were selected randomly as sufficient number of BBF planters distributed by State Department of Agriculture, Govt. of Maharahstra. Three villages from each selected talukas were selected randomly. Ten soybean growers from each selected village who using Broad Bed Furrow technology were selected randomly. Thus a total of 120 respondents were selected as sample respondents for this study. Structured interview schedule was prepared. To test the utility perception, 19 items were selected as advantages of BBF technology in soybean cultivation. Responses from respondents were collected on three point continuum, very useful, useful and not useful by assigning score 2, 1 and 0 respectively. Then the respondent was categorized on the basis mean ± SD.

RESULTS AND DISCUSSION

1. Utility of Broad Bed Furrow (BBF) technology as perceived by the soybean growers

Table 1. Distribution of respondents according to advantage wise utility perception of broad bed furrow technology in soybean cultivation. (n=120)

Sr. No.	Advantages of BBF technology for soybean cultivation	Advantage wise utility		
		Very Useful	Useful	Not Useful
1	Proper conservation of rain water	110 (91.67)	09 (7.50)	01 (00.83)
2	Good surface drainage	109 (90.83)	11 (9.17)	00 (00.00)
3	Better aeration in seed bed and root zone	93 (77.50)	17 (14.17)	10 (08.33)
4	Reduce runoff	73 (60.83)	29 (24.17)	18 (15.00)
5	Reduce soil loss	62 (51.67)	46 (38.33)	12 (10.00)
6	Maintain proper distance between two plants	90 (75.00)	20 (16.67)	10 (08.33)
7	Reduce labour charges	80 (66.67)	27 (22.50)	13 (10.83)
8	Time saving technology	79 (65.83)	29 (24.17)	12 (10.00)
9	Work efficient technology	82 (68.33)	25 (20.84)	13 (10.83)
10	Maintain proper plant population per acre	79 (65.83)	21 (17.50)	20 (16.67)
11	Suppresses the weed growth	83 (69.17)	28 (23.33)	09 (07.50)
12	Reduce cost of operation	73 (60.83)	27 (22.50)	20 (16.67)
13	Proper fertilizer management	75 (62.50)	25 (20.83)	20 (16.67)
14	Minimizing drought effect	81 (67.50)	21 (17.50)	18 (15.00)
15	Increase in germination percentage	85 (70.83)	18 (15.00)	17 (14.17)
16	More number of pods and seeds per plant	82 (68.33)	20 (16.67)	18 (15.00)
17	Less seed require for sowing	78 (65.00)	24 (20.00)	18 (15.00)
18	Better intercultural operation perform	85 (70.83)	22 (18.34)	13 (10.83)
19	Increase in the yield	90 (75.00)	21 (17.50)	09 (07.50)

* Figure in parenthesis indicates percentage

The information pertaining to utility of broad bed furrow technology as perceived by the soybean growers is depicted in Table 1. As regards advantage wise perceived utility of BBF technology, Table 1 indicated that majority of the respondents (91.67%) perceived that BBF technology is very useful for proper conservation of rain water, followed by BBF technology is very useful for good surface drainage (90.83%), better aeration in seed bed and root zone (77.50%), maintain proper distance between two plants (75.00%), increase in the yield (75.00%), increase in germination percentage (70.83%), better intercultural operation perform (70.83%), suppresses the weed growth (69.17%), more number of pods and seeds per plant (68.33%), work efficient technology (65.83%), minimizing drought effect (67.50%), reduce labour charges (66.67%), time saving technology (65.83%), maintain proper plant population (65.83%), less seed require for sowing (65.00%), proper fertilizer management (62.50%), reduce runoff (60.83%), reduce cost of operation (60.83%) and reduce soil loss (51.67%).

Further it is perceived by the respondents that BBF technology is useful for reducing soil loss (38.33%), reducing runoff water and time saving (24.17%), suppresses the weed growth (23.33%), reducing labour charges (22.50%) and reducing cost of operation (22.50%). It was further observed that 16.67 per cent of the respondents perceived that BBF technology is not useful for reducing cost of operation, proper fertilizer management, maintain proper plant population whereas 15.00 per cent of them perceived that BBF technology is not useful for increasing number of pods and seeds per plant, less seed require for sowing, minimizing drought effect and reducing runoff water.

2. Overall utility perception of soybean growers towards BBF technology.

Table 2 revealed that nearly half of the respondents (56.67%) belonged to medium utility perception category, while 25.00 per cent from low utility perception category and only 18.33 per cent respondents belonged to high utility perception category about BBF technology.

Table 2. Distribution of respondent according to their overall utility perception towards BBF technology.

Sr. No.	Knowledge level	Freq. (n=120)	Percentage
1.	**Low** (up to 28)	30	25.00
2.	**Medium** (29 to 34)	68	56.67
3.	**High** (35 & above)	22	18.33

3. Problems faced by the respondent in adoption of BBF technology in soybean cultivation.

During the course of investigation, soybean growers who utilizing BBF technology expressed many problems, which are presented in Table 3. Table 3 depicts that 84.16 per cent of the respondents expressed the problem of high cost of BBF planter for individual purchase, followed by 82.50 per cent of them reported the lack of funding support from government to purchase individually BBF planter. Whereas 78.33 per cent of the respondents reported non-availability of spare parts of BBF planter in the local market. The problem of non-suitability of BBF planter for hard soil surface land and lack of knowledge about proper setting of BBF planter were expressed by 76.66 and 63.33 per cent respondents, respectively. Lack of timely and proper guidance about operation of BBF planter is the problem expressed by 60.83 per cent of the respondents while lack of information about different government schemes related to BBF planter is the problem expressed by 57.50 per cent of the respondents. The problems of non-availability of skilled labour for operating of BBF planter and lack of knowledge about handling the gear system of tractor operated BBF planter were by 54.16 and 51.66 per cent of the respondents, respectively.

Table 3. Distribution of soybean growers according to problem faced in adoption of BBF technology.

Sr. No.	Problem	Frequency (n=120)	Percentage	Rank
1	High cost of BBF planter for individual purchase	101	84.16	I
2	Lack of funding support from government to purchase BBF planter individually.	99	82.5	II
3	Non-suitability of BBF technology for hard soil surface land.	92	76.66	IV
4	Non-availability of spare parts of BBF planter at local market.	94	78.33	III
5	Lack of timely and proper guidance about operation of BBF planter.	73	60.83	VI
6	Lack of knowledge about proper setting of BBF planter.	76	63.33	V
7	Non availability of skilled labour for operating of BBF planter.	65	54.16	VIII
8	Lack of information about different govt. schemes related to BBF planter.	69	57.5	VII
9	Lack of knowledge about handling the gear system of tractor operated BBF planter.	62	51.66	IX

4. Suggestions of the soybean growers to overcome the problems faced in the adoption of BBF technology.

Table 4. Suggestions of the soybean growers to overcome the problems faced in the adoption of BBF technology.

Sr. No.	Suggestions	Frequency (n=120)	Percentage	Rank
1	Establishing a custom hiring center of farm machineries which includes BBF planter along with tractor at village level.	103	85.83	I
2	Workshop on operation, handling and maintenance of BBF planter should be organized by State Dept. of Agril. Or Agril. University/ Farm machinery's companies.	101	84.16	II
3	Make easy availability of spare parts of BBF planter at taluka place.	86	71.66	IV
4	Govt. should provide loans and subsidies for purchase of BBF planter	89	74.16	III
5	Modify BBF planter as per need of the farmers	72	60.00	V

Table 4 reported suggestions given by respondents in order to overcome the problems faced by them in adoption of broad bed furrow technology in soybean. The data revealed that majority of the respondents (85.83%) suggested establishing a custom hiring center of BBF planter along with tractor in the village. While 84.16 per cent of respondents suggested to organize workshop on operation, handling and maintenance of BBF planter either by State Department of Agriculture or State Agricultural University and Farm machinery's companies. Whereas 74.16 per cent of respondents suggested that government should provide loans and subsidies for purchase of BBF planter. While 71.66 per cent of them suggested to make easy availability of spare parts of BBF planter at taluka place and 60.00 per cent of respondents suggested to modify BBF planter as per need of the farmers.

CONCLUSION

The findings of the study concluded that majority of the respondents perceived that BBF technology is very useful for proper conservation of rain water, for good surface drainage, better aeration in seed bed and root zone, maintain proper distance between two plants, increase in the yield, increase in germination percentage, better intercultural operation perform, suppresses the weed growth, more number of pods and seeds per plant, work efficient technology and minimizing drought effect. Whereas 84.16 per cent of the respondents expressed the problem of high cost of BBF planter for individual purchase and 82.50 per cent of them reported the lack of funding support from government to purchase individually BBF planter. The data also revealed that majority of the respondents (85.83%) suggested establishing a custom hiring center of BBF planter along with tractor in the village. While 84.16 per cent of respondents suggested to organize workshop on operation, handling and maintenance of BBF planter either by State Department of Agriculture or State Agricultural University and Farm machinery's companies.

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RESEARCH ARTICLE

Distresses on the Attitude of Sardar Sarovar Project Affected Farmers Towards Rehabilitation

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ABSTRACT

The present study was carried in five talukas of Baroda district and total 250 Project Afffected Farmers (PAFs) were randomly selected as a respondents. The objective is to find out direct and indirect affects of factors on attitude towards rehabilitated place. The results shows that the major variables contributing the maximum direct and positive effect on the attitude towards rehabilitated place of PAFs were the innovativeness, attitude towards modern agriculture, sources of information, annual income, socio-economic status and scientific orientation, whereas, risk orientation, attitude towards modern agriculture, scientific orientation, material possession, extension contact, annual income, education, source of information and socio-economic status were the major variables contributing the maximum total indirect and positive effect on the attitude towards rehabilitated place of PAFs.
***Key words :** Attitude, Rehabilitation, Project affected, Farmer*

METHODOLOGY

The present study was carried out in five talukas of Baroda district, where large number of Project Affected Farmers (PAFs) were resettled. All vasahats falling under selected talukas were included in the study. Thus, total 121 vasahats from five talukas were selected for the study. From the availability of PAFs in each vasahats of five talukas, five per cent of PAFs were selected through proportionate random sampling technique. Thus, total 250 PAFs were randomly selected as a respondents for the present study**.** Data were collected with the help of pretested structured interview schedule. To analyze the direct and indirect effects of dependent and independent variables, path analysis was employed.

A scale was developed for the measurement of Attitude towards rehabilitated place of the respondents.

RESULTS AND DISCUSSION

Attitude towards rehabilitated place of the respondents :

Table 1 reported that more than one third (36.80 per cent) of the respondents had neutral attitude towards rehabilitated place i.e. neither they were unfavourable nor favourable attitude towards rehabilitated place, followed by 34.00 per cent and 29.20 per cent with favourable and unfavourable attitude towards rehabilitated place, respectively.

Table 1 : Distribution of the respondents according to their attitude towards rehabilitated place N= 250

Sr. No	Category	Number	Per cent
1.	**Unfavourable** (upto 48 score)	73	29.20
2.	**Neutral** (49 to 53 score)	92	36.80
3.	**Favourable** (above 53 score)	85	34.00
	Total	**250**	**100.00**
Mean- 50.5			SD - 2.45

It can be concluded that the majority (70.80 per cent) of the respondents had neutral to favourable attitude towards rehabilitated place. The neutral to favourable attitude towards rehabilitated place of majority of the respondents, proved that Government of Gujarat and Narmada Rehabilitation Agency have taken good interest to rehabilitate them in new places.

Direct and indirect effects of selected independent variables on attitude towards rehabilitated place Direct Effect

Table 2 : Path Coefficient Showing the Direct, Total Indirect and Substantial Indirect Effect of Independent Variables on Attitude Towards Rehabilitated Place

Variables	Direct effects	Indirect effects	Substantial indirect effect	
			First order	Second order
X1 Age	-0.0072	-0.5834	0.2901 X9	0.0654 X3
X2 Education	-0.0001	0.2193	0.2009 X8	0.0425 X5
X3 Material possession	-0.1543	0.4906	0.4470 X8	0.0763 X11
X4 Socio-economic status	0.0782	0.1117	0.1559 X8	0.0456 X5
X5 Annual income	0.1123	0.2442	0.2737 X8	0.0437 X11
X6 Extension contact	-0.0201	0.2974	0.3663 X8	0.0623 X11
X7 Sources of information	0.1252	0.1767	0.2693 X8	0.5190 X11
X8 Innovativeness	0.8718	-0.1733	0.1409 X11	0.0387 X7
X9 Risk orientation	-0.3636	0.9507	0.7895 X8	0.1341 X11
X10 Scientific orientation	0.0259	0.5175	0.6662 X8	0.1146 X11
X11 Attitude towards modern agriculture	0.1508	0.5533	0.8149 X8	0.0431 X7

The data in Table 2 revealed that the six variables out of eleven selected independent variables found to have positive direct effect whereas remaining five variables had negative but direct effect on the attitude towards rehabilitated place of PAFs. An innovativeness had maximum positive direct effect (0.8718), followed by attitude towards modern agriculture (0.1508), sources of information (0.1252), annual income (0.1123), socio-economic status (0.782) and scientific orientation (0.0259) respectively. The variable, risk orientation had maximum negative direct effect (-0.3636), material possession (-0.1543), extension contact (-0.0201), age (-0.0072) and education (-0.0001), respectively on the attitude towards rehabilitated place of PAFs.

Total Indirect Effect

Among the eleven selected independent variables, nine variables exerted positive total indirect effect on attitude, whereas two variables exerted negative indirect effect on attitude towards rehabilitated place. Further, it can be observed that risk orientation had maximum positive total indirect effect (0.9507), followed by attitude towards modern agriculture (0.5533), scientific orientation (0.5175), material possession (0.4906), extension contact (0.2975), annual income (0.2442), education (0.2193), sources of information (0.1767) and socio-economic status (0.1117) respectively. The variable, age had maximum negative total indirect effect (-0.5834) followed by innovativeness (-0.1733) respectively on the attitude towards rehabilitated place of PAFs.

Substantial Indirect Effect

The data in Table 2 reported that the first maximum positive substantial indirect effect was exerted by attitude towards modern agriculture (0.8149), followed by risk orientation (0.7895), scientific orientation (0.6662), material possession (0.4470), extension contact (0.3663), annual income (0.2737), sources of information (0.2693), education (0.2009) and socio-economic status (0.1559) routed through the variable, innovativeness. Whereas, age (0.2901) was observed to have exercised positive substantial indirect effect through risk orientation, while innovativeness (0.1409) was observed to have exercised positive substantial indirect effect through attitude towards modern agriculture. The second positive largest substantial indirect effect was exerted by risk orientation (0.1341) through attitude towards modern agriculture.

It can be concluded that nine out of eleven independent variables had their first largest substantial indirect effects through innovativeness, one variable had its indirect effect through risk orientation and one variable had its indirect effect through attitude towards modern agriculture. In case of second largest substantial indirect effect six variables had their indirect effect through attitude towards modern agriculture, two variables had its indirect effect through sources of information, two variables had its indirect effect through annual income and one variable had its indirect effect through age.

CONCLUSION

From the forgoing discussion, it could be inferred that the major variables contributing the maximum direct and positive effect on the attitude towards rehabilitated place of PAFs were the innovativeness, attitude towards modern agriculture, sources of information, annual income, socio-economic status and scientific orientation, whereas, risk orientation, attitude towards modern agriculture, scientific orientation, material possession, extension contact, annual income, education, source of information and socio-economic status were the major variables contributing the maximum total indirect and positive effect on the attitude towards rehabilitated place of PAFs.

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RESEARCH ARTICLE

A Study on Farmers Adoption of High Density Plantation in Guava

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ABSTRACT

Guava (Psidium guajava L.) belonging to the Myrtacea family popularly known as the "Apple of Tropics" has gained considerable prominence on account of its high nutritive value, pleasant aroma, good flavor and availability at moderate prices. It is originated along with a number of other fruits in tropical America and seems to have been growing from Mexico to Peru. It is believed to be introduced in India at a very early stage, as mentioned by Burton who was in India in early 17th century. Guava is a rich source of vitamin C where content varies from 75-260 mg/100gm and pectin, moderately good source of calcium and fair source of phosphorous. Ripe guava fruits emit a characteristic sweet aroma and have a pleasant sour sweet taste. Maharashtra is one of the leading guava producers, both in area and production, followed by Madhya Pradesh, Uttar Pradesh and Bihar. Productivity is highest in Madhya Pradesh, followed by Karnataka, Bihar, West Bengal and Gujarat. The major guava producing districts in Maharashtra are Ahmednagar, Nasik, Satara, Beed, Pune, Aurangabad, Amaravati, Jalgaon, Jalana, Akola and Wardha (Anonymous, 2015).

KEYWORDS: High density plantation (HDP), Extent of adoption

The high density planting is the latest technology where fruit trees are planted at closer spacing leading to high density or meadow orchard. Certain important strategies have been identified for enhancing horticulture development in India in order to be competitive in the world market. They involve adoption of modern, innovative and high-tech methods. One such strategy is the high density plantation (HDP). This includes adoption of appropriate plant density, canopy management, quality planting material, support and management system with appropriate inputs. HDP generally refers to planting at closer spacing than the normal recommended spacing. It has been attempted in different crops such as guava, apple, banana, mango etc. Many guava farmers have been adopting this technology successfully in different parts of the country. HDP technology results in maximization of unit area yield and availability of the fruits in the market early which fetch better price. With rising input costs, HDP is a way of increasing efficiency of agriculture inputs. This technology extensively cover 1.82 lakh ha area in different states of the country especially in Maharashtra, Rajasthan, Karnataka, Haryana, Uttar Pradesh and Jharkhand. The standard spacing for guava is 6x6m, which accommodates 277 plants/ ha. In HDP 3x1.5 m accommodates 2222 plants /ha, 3x3 m accommodates 1111plants/ha, 6x3 m accommodates 555 plants/ha and 3x2 m accommodates 1666 plants/ha. The Maharashtra farmers lead in adopting the meadow orchards as they have the skills to prune the plants (Singh, 2008). The high density planting facilitates enhance production and quality of fruits. It also gives more income than traditional method due to increased number of trees per hectare. So, it is economically more favorable fruit crop in India. It is important to know the acceptability of this technology. Thus, the present research study was undertaken with the following objective.- To study the extent of adoption of high density plantation in guava.

METHODOLOGY

The present study was conducted in Ahmednagar and Nasik districts of Maharashtra state. In that two tahsils were selected i.e Rahata tahsil from Ahmednagar district and Malegaon tahsil from Nasik district. These districts were purposively

selected because of larger area under guava cultivation. In all 120 respondents from these two districts were randomly selected for the study. Keeping in view the objective of the study, an interview schedule was prepared and data were collected. Appropriate statistical methods were used for analysis of data and interpretation of the results.

RESULTS AND DISCUSSION

The data on adoption of recommended practices of high density plantation in guava are presented in Table 1.

Table 1 Distribution of respondents by their adoption of high density plantation technology of guava

S.N.	Recommended Practice	Complete adoption		Partial adoption		No adoption	
		Frequency	Percent	Frequency	Percent	Frequency	Percent
1.	**A) Preparatory tillage Land preparation**						
	i) Ploughing	120	100.00	00	00	00	00
	ii) Harrowing 2-3 times and leveling	68	56.67	41	34.17	11	9.17
	B)Time of planting						
	June-July	120	100.00	00	00	00	00
	C) Planting distance						
	i) 6x6m	72	60.00	16	13.33	32	26.67
	ii) 3x3m	68	56.66	16	13.34	36	30.00
	iii) 3x2m	62	51.66	14	11.68	44	36.66
	D) Size of pit						
	i) 60x60x60cm.	44	36.67	61	50.83	15	12.59
	ii) 75x75x75cm.	32	26.66	21	17.50	67	55.84
	E) **Care while planting and pit filling**	69	78.33	20	16.67	6	5.00
2.	**Selection of variety**						
	a) Sardar (L-49)	90	75.00	20	16.67	10	8.33
	b) Allahabad Safeda	20	16.66	80	66.68	20	16.66
	c) Lalit	10	8.34	65	54.16	45	37.50
	d) Shewta	00	00	00	00	120	100.00
3.	**Propogation methods**						
	a) Tongue layering	96	80.00	12	10.00	12	10.00
	b) Wedge grafting	32	26.67	40	33.33	48	40.00
4.	**Fertilizer dose**						
	i) As per MPKV, Rahuri	42	35.00	44	36.67	34	28.33
	ii)As per CISH, Lucknow	00	00	12	10.00	108	90.00
5.	Application of micronutrient	13	10.83	25	20.83	82	68.34
6.	Bahar treatment	72	60.00	13	10.84	35	29.16
7.	Pruning	68	56.67	15	12.50	37	30.83
8.	Training	57	47.50	16	13.34	47	39.16
9.	**Weed management**						
	i) Cultural methods						
	-Ploughing	100	83.33	12	10.00	8	6.67
	-Hand weeding	97	80.84	12	10.00	11	9.16
	-Harrowing	95	79.88	14	11.66	11	9.16
	ii)Chemical method						
	-Glyphosate	71	59.17	35	29.17	14	11.66
	iii)Biological methods						
	-Xygograma bicolarata	00	00	00	00	120	100.00
10.	Proper time of harvesting	120	100.00	00	00	00	00

11.	**Method followed for irrigation**						
	a] Flood method	82	68.33	26	21.68	12	10.00
	b] Drip method	38	31.67	32	26.67	50	41.67
12.	**Pest management**						
	(Major pest) a) Fruit fly, b) Mealy bug, c) White fly -Methods for controlling Pest 1)Cultural method	42	35.00	60	50.00	18	15.00
	-Deep ploughing	35	29.16	37	30.84	48	40.00
	-Harrowing	22	18.33	33	27.50	65	54.20
	-Destroy affected parts	62	51.66	35	29.16	23	19.18
	2)**Chemical methods**						
	Protein hydrolsate and Malathion (0.1-0.25+0.05%) On host tree for killing of adult flies	81	67.50	33	27.50	6	5.00
	3)**Biological method** -Hanging of wooden box trap soaked in methyl eugenol	4	3.34	6	5.00	110	91.66
	-Light traps	12	10.00	17	14.16	91	75.84
13.	**Disease management (Major disease)**						
	a)Canker Control measure -Application of Bordeaux paste	71	59.17	22	18.33	27	22.50
14.	**Packaging**						
	a)Plywood box	32	26.67	48	40.00	40	33.33
	b)Crates	120	85.00	10	8.83	8	6.67
	c)C.F.B	4	3.33	12	10.00	104	86.67
15.	**Marketing channels**						
	a)Self-marketing	111	92.50	5	4.17	4	3.33
	b)By auction	42	35.00	26	21.67	52	43.33
	c)Agriculture Produce Market Committee	94	78.33	20	16.67	6	5.00
	d)Other	20	16.67	22	18.33	78	65.00
16.	Processing of guava fruits (Value added product)	8	6.67	36	30.00	76	63.33

The results regarding adoption of high density plantation technology of guava by the respondents presented in Table 1 revealed that cent per cent of the guava growers had completely adopted tillage practices like ploughing, while, 56.67 per cent of the respondents had completely adopted harrowing. It was observed that 56.66 per cent of the guava growers had adopted the planting distance 3 x 3 m and 51.66 per cent of them had followed 3 x 2 m planting distance. In respect of recommended guava varieties it was observed that majority (75.00 %) of respondents had cultivated Sardar (L-49) variety, while, 16.66 per cent of the respondents had taken Allahabad Safeda variety. Majority of respondents (80.00 %) had completely adopted tongue layering method for propagation. Regarding fertilizer management it was revealed from Table 1 that only 35.00 per cent of the respondents had complete adoption of recommended dose of fertilizers, while, 36.67 per cent of the respondents had partially adopted the recommended dose of fertilizers. A substantial proportion (68.34%) of the respondents had not adopted the application of micronutrients.

Majority (60.00 %) of the respondents had complete adoption of bahar treatment, while, 29.16 per cent of them had not adopted bahar treatment. More than half (56.67 %) of the respondents had completely adopted pruning practice, while, 30.83 per cent of them had not adopted this practice. Further, the data revealed that 47.50 per cent of the guava growers had completely adopted training practices, whereas, 39.16 per cent of them had not adopted this practice. The recommended stage of harvesting of guava when fruits become dark green to yellowish green with softness was followed by the cent per cent respondents. It was observed that 35.00 per cent of the respondents had completely adopted cultural method for pest management, while, more than two third (67.50 %) of the respondents adopted chemical method for pest management. The biological methods were not adopted by majority (91.66 %) of the respondents. It was observed that more than half (59.17 %) of the respondents had complete adoption of disease management in guava.

The results showed that 85.00 per cent of guava growers used crates for packaging of guava, while, 26.67 per cent of respondents used plywood box. It was found that a large majority (92.50 %) guava growers prefer self-marketing channel for marketing of guava, whereas, 78.33 per cent of the respondents sold guava through Agriculture Produce Market Committee and 35.00 per cent of the respondents sold their produce by auction.

CONCLUSION

The research findings indicated that a majority of the guava growers had medium adoption about recommended dose of fertilizers, use of micronutrients and biological methods for pest management which resulted in incomplete adoption of high density plantation technology. Therefore, the extension agencies need to organize training programmes for upgrading farmers knowledge regarding these practices. In addition to that, result demonstrations need to be organized in cluster approach, especially in guava growing tract of the state for popularizing the high density plantation technology in guava. Value addition of horticultural produce, especially that of guava is very much essential for additional gain in income of the guava growers. The study has pointed out the lack of adoption of value added products of guava by the respondents. Therefore, the State Marketing Board need to establish processing units, as well as, good storage facilities in the guava belt.

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RESEARCH ARTICLE

Knowledge of Kisan Call Centre Operators in Maharashtra about Protected Cultivation Technology of Flowers and Vegetables

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ABSTRACTS

The present study was conducted in Maharashtra state. The list of Kisan Call Centre operators was obtained from the Kisan Call Centre in Maharashtra. The total number of Kisan Call Centre operators was 69. The data was collected by interviewing 69 KCC operators with the help of well designed and pre-tested schedules. The study revealed that majority of the KCC operators were young aged, having four year B.Sc. (Agri.) degree, with 4 years and above total service experience. Majority of the respondents had high service experience as KCC Operator. Majority of the respondents attended the training on weather forecasting by IMD. Majority of the respondents had medium extension contacts and medium source of information. It was observed that 60.00 per cent of respondents were having medium level of knowledge about protected cultivation technology of flowers and vegetables.

Keyword*: Knowledge level, Kisan Call Centre Operators, Protected cultivation technology*

India is a country of agriculture as the main occupation and majority of the population lives on agriculture. The information requirement of farmers now is demand driven which is different from supply led approach of green revolution. The problems of mobility and demand driven can be narrowed down by efficient use of information and communication technology (ICTs) for accurate, timely, relevant information and services to farmers. Telecommunication as a mean of sharing information is not simply a connection between people but link in the chain of the development process itself.

The Department of Agriculture and Cooperation, Ministry of Agriculture, Govt. of India has launched Kisan Call Centre with a view to leverage the extensive telecommunication infrastructure in the country to deliver extension services to the farming community. The entire network has been made available from 21st January 2004 throughout the country. In KCC, operators are the important link in transfer of information to the farmer field. The role of KCC operators is to transfer the information to farmers so that they can adopt new idea and improved practices.For the effective dissemination of improved technology/information to the farmers, it is of immense importance that the operators in the KCC should have sufficient and proper knowledge of all these technologies. It is therefore decided to study the knowledge of "Kisan call Centre operators in Maharashtra about protected cultivation technology of flowers and vegetables."

METHODOLOGY

The present study was conducted in Maharashtra state during the year 2015-2016. There is only one Kisan Call Centre in Maharashtra which is situated at Pune district. So the Kisan Call Centre in Maharashtra was selected purposively as locale of the study.

The list of 69 Kisan Call Centre operators was obtained from the Kisan Call Centre in Maharashtra. Data was collected by contacting the respondents personally through structural interview schedule. The qualitative data converted into quantitative form. The collected data was processed and discussed by using the percentage.

RESULTS AND DISCUSSION

Profile of KCC Operators in Maharashtra

Majority (97.10 per cent) of the respondent's belonged to young age group, followed by the middle (2.90 per cent) and none of the respondents belonged to old age. 47.85 per cent of the respondents were B.Sc. (Agril), followed by 17.38 per cent completed M.Sc. (Agril), 13.04 per cent of them had completed PGDMBA (Agri.), 8.68 per cent of the respondents passed B.Sc. (Horti), 7.25 per cent of them had completed ABM, and (5.80 per cent) were M.Sc. (Horti).

Equal per cent (40.58 per cent) of the KCC operators belonged to high and medium total service experience, while 18.84 per cent of them had less total service experience. Nearly half (49.28 per cent) of the respondents had high service experience as KCC Operator, followed by 30.43 per cent and 20.29 per cent of the respondents had less and medium service experience as KCC Operator.

Half (50.72 per cent) of the KCC operators had attended the training on weather forecasting by IMD, 40.58 per cent attended the soft skill training by IKSL Delhi, 37.68 per cent of the respondents attended the training on fertilizer management by IFFCO, 36.23 per cent attended the training about kharif crop and rabbi crop, 34.78 per cent of them attended the training on scientific beekeeping, 33.33 per cent of the respondents attended the training on pest diseases management on Horticulture crop & post harvest technology of pomegranate and grapes and 28.98 per cent of the KCC operators had attended the training on National Horticulture Research and Development Foundation.

Majority (55.07 per cent) of the respondents had medium extension contacts, while 26.09 per cent and 18.84 per cent of them had high and less extension contacts respectively. Majority (65.22 per cent) of the respondents had medium source of information, while 21.74 per cent and 13.04 per cent respondents had high and less source of information respectively. More than half (55.07per cent) of the respondents had medium social participation, while 23.19 per cent and 21.74 per cent respondents had high and low social participation respectively.

Knowledge of KCC Operators about Protected Cultivation Technology of Flowers and Vegetables

Most of the respondents had complete knowledge regarding use of polyhouse in protected cultivation, source of irrigation water is to be given importance, use of drip irrigation system in protected cultivation and use of shadenet house in protected cultivation.

Majority of the respondents had partial knowledge regarding use of aeroponics in protected cultivation, use of CO_2 gas generator in protected cultivation of flowers and vegetables, use of automized irrigation system and incandescent and fluorescent supplement lighting system in protected cultivation, use of temporary low height polyhouse for the production of off season vegetables and to investigate roof top rainwater harvesting system for polyhouse to ensure the proper irrigation in rainfed condition.

Majority of the respondents had no knowledge regarding to experiment the use of the multi-coloured LED's (Light emitting diodes) for a potential enhancement of yield and improvement in the quality and taste of the product, use of petroleum mulches system in protected cultivation and use of aqua hydroponic system as advanced protected cultivation system.

Majority (60.87 per cent) of respondents had medium level, followed by 20.29 per cent and 18.84 per cent of respondents had high and low level of knowledge respectively about protected cultivation of flowers and vegetables.

Table 1. Distribution of KCC operators by their knowledge level about protected cultivation technology of flowers and vegetables

Sr No	Knowledge level	Number (n=69)	Per cent
1.	Low (Score upto 58)	13	18.84
2.	Medium (Score 59 to82)	42	60.87
3.	High (Score 83 and above)	14	20.29
	Total	**69**	**100.00**

Table 2. Distribution of KCC operators by their knowledge level about protected cultivation technology of flowers and vegetables

Sr. No.	Statements	Knowledge					
		Complete Knowledge		Partial knowledge		No knowledge	
		Nos.	Per cent	Nos.	Per cent	Nos.	Per cent
1.	Whether to consider available land during protected cultivation	43	62.32	25	36.23	1	1.45
2.	Whether market survey is essential before deciding crop to be grown under protected cultivation.	39	56.52	24	34.78	6	8.69
3.	Whether to consider available resources during protected cultivation	49	71.01	15	21.74	5	7.25
4.	Whether to use shadenet house in protected cultivation.	52	75.36	13	18.84	4	5.80
5.	Whether to use polyhouse in protected cultivation	58	84.06	11	15.94	0	0
6.	Whether to use shadenet for growing following flowers and vegetables						
	i. Exotic vegetables	20	28.99	25	36.23	24	34.78
	ii. Anthurium and Orchid	23	33.33	30	43.48	16	23.19
	iii. Capsicum, cucumber and cherry tomato	43	62.32	23	33.33	3	4.35
7.	Whether to use polyhouse for cultivation of rose, carnation and gerbera.	50	72.46	19	27.54	0	0
8.	In protected cultivation whether to consider different media for growing flowers and vegetables.	39	56.52	26	37.68	4	5.80
9.	Whether red soil should be used for protected unit.	32	46.38	26	37.68	11	15.94
10.	In protected cultivation whether to use soil less media for nursery or seedling production for growing flowers and vegetables.	34	49.28	16	23.19	19	27.54
11.	Whether to use tissue culture plant technique in protected cultivation for growing flowers and vegetables.	32	46.38	32	46.38	5	7.25
12.	Whether the computer can anticipate weather change and make adjustments in heating and ventilation systems, thus saving energy with proper programming and sensing systems.	29	42.03	30	43.48	10	14.49
13.	Whether to give important to the greenhouse structure and it's covering for the protection of crop against hostile weather condition, diseases and pest.	33	47.83	36	52.17	0	0
14.	Whether to consider the factors while selecting the greenhouse covering material such as light transmission, covering material, resistances to impact durability to outdoor weathering and thermal stability over wide range of temperature.	38	55.07	29	42.03	2	2.90
15.	Whether to use following covering material for protected cultivation						
	i. Polyethylene film	45	65.22	22	31.88	2	2.90
	ii. Polyvinyl chloride film	43	62.32	20	28.99	6	8.70
	iii. Carbonated sheet	14	20.29	32	46.38	23	33.33
16.	Whether source of irrigation water is to be given importance.	57	82.61	9	13.04	3	4.35
17.	Whether available water need to be tested for p^H and EC.	49	71.01	18	26.09	2	2.90
18.	Whether to use following irrigation system in protected cultivation						
	i. Drip irrigation	53	76.81	14	20.29	2	2.90
	ii. Hand water supply	51	73.91	16	23.19	2	2.90
	iii. Misting and sprinklerirrigation	41	59.42	23	33.33	5	7.25
19.	Whether to use automized irrigation system for growing flowers and vegetables in protected cultivation along with smart weather sensing system.	24	34.78	39	56.52	6	8.70

Sr. No.	Statements	Knowledge					
		Complete Knowledge		Partial knowledge		No knowledge	
		Nos.	Per cent	Nos.	Per cent	Nos.	Per cent
21.	Whether organic fertilizer and pesticides be given importance for vegetables and flowers grown under protected cultivation	40	57.97	27	39.13	2	2.90
22.	Whether to use temporary low height polyhouse for the production of off season vegetables.	18	26.09	37	53.62	14	20.29
23.	Whether to experiment the use of the multi-coloured LED's (Light emitting diodes) for a potential enhancement of yield and improvement in the quality and taste of the product	5	7.246	18	26.09	46	66.67
24.	Whether to investigate roof top rainwater harvesting system for polyhouse to ensure the proper irrigation in rainfed condition.	17	24.64	37	53.62	15	21.74
25.	In forced or active ventilation whether to use mechanical device such as fan to expel the air.	28	40.58	31	44.93	10	14.49
26.	Whether to use overhead ventilation and side ventilation in protected cultivation to provide proper air movement and air exchange for controlling temperature and humidity.	38	55.07	27	39.13	4	5.80
27.	Whether to use following cooling system in protected cultivation.						
	i. Exhaust fan in end wall	31	44.93	28	40.58	10	14.49
	ii. Evaporative cooling	39	56.52	25	36.23	5	7.246
	iii. Mist cooling	39	56.52	25	36.23	5	7.246
	iv. Circulating fans	39	56.52	26	37.68	4	5.797
	v. Fogging system	47	68.12	18	26.09	4	5.797
28.	Whether to use following humidity maintaining system in protected cultivation						
	i. Fogging	41	59.42	24	34.78	4	5.80
	ii. Misting	44	63.77	21	30.43	4	5.80
29.	Whether to use thermometer in protected cultivation.	47	68.12	16	23.19	6	8.70
30.	Whether to use CO_2 gas generator in protected cultivation in flowers and vegetables.	6	8.696	42	60.87	21	30.43
31.	Whether to use following greenhouse supplement lighting system						
	i. Incandescent	8	11.59	39	56.52	22	31.88
	ii. Fluorescent	8	11.59	39	56.52	22	31.88
32.	Whether to use integrated pest management in protected cultivation	46	66.67	19	27.54	4	5.80
33.	Whether to use interior light such as UV or yellow mercury vapour for insect trap.	16	23.19	32	46.38	21	30.43
34.	Whether to use following plastic mulching system in protected cultivation						
	i. Petroleum mulches	9	13.04	22	31.88	38	55.07
	ii. Paper mulches	32	46.38	28	40.58	9	13.04
	iii. Plastic polyethylene mulches	40	57.97	23	33.33	6	8.70
35.	Whether to use post harvest management technique such as pack house, ripening chamber, retail outlets, pre-cooling unit primary processing for increasing the shelf life of flowers and vegetables.	38	55.07	26	37.68	5	7.25
36.	Whether to use aqua hydroponic system as advanced protected cultivation system.	19	27.54	25	36.23	25	36.23
37.	Whether to use aeroponics in protected cultivation	0	0	45	65.22	24	34.78

CONCLUSION

The study revealed that majority of the KCC operators were young aged, having four year B.Sc. (Agri.) degree, having 4 years and above total service experience and high service experience as KCC Operator. Majority of the respondents attended the training on weather forecasting, medium extension contacts and medium source of information. It was observed that third fifth per cent of respondents were having medium level of knowledge about protected cultivation technology of flowers and vegetables.

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RESEARCH ARTICLE

Constraints Faced by Women Self Help Group (SHGs) Members in their Empowerment

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ABSTRACT

Self help group is a small voluntary association of poor people, preferably from the same socio-economic background. Women's SHGs are transforming the face of Indian villages and strengthening the gender equity. Economic independence and trainings have empowered the women. In SHGs women interact with each other, understand their common problems, enhance their savings and encourage the education. SHG aims to improve the quality of life of women by self-reliance, up grading their skills and ensuring sustainability of groups. But there are some barriers which hold them back from empowerment. Hence, the study aimed to know the constraints faced by women members of self help groups (SHGs) in their empowerment and obtain their suggestions. The important constraints faced by the women members of SHGs were high interest rate of loan, lack of market for selling products, negligence by other family members regarding decision taken by women about economic development, unavailability of loans from banks in time, lack of regular training to members of SHGs, uncertain market price for their produce, lack of freedom to take decision for self travelling and equal treatment is not given by male family members. The study was concluded that the majority of the women members of SHGs faced the financial problems hence; the financial institution should make appropriate arrangements for quick disbursement of loan, moderate interest loan and sufficient amount of loan as per the project proposed by the SHGs. The policy makers, planners should try to make strategy to overcome the constraints faced by the SHGs and also for encouraging the women through different programmes like decision making, capacity building of SHGs women by different extension agencies.

Keywords: *Constraints, Women, Self Help Groups, Empowerment*

METHODOLOGY

The study was conducted in Hatkanangale and Shirole tahsils of Kolhapur district of Maharashtra state. From each tahsil 12 villages and one SHG from each village were selected and from each SHG ten respondents were selected randomly by lottery method. Thus, 120 SHG members were included in the sample for the study. Data were collected from personal interview.

RESULTS AND DISCUSSION

Constraints faced by Women Members of Self Help Groups (SHGs) in their Empowerment

Constraints faced by women members of SHGs were discussed in table no.1

The important constraints faced by the women members of SHGs were high interest rate of loan (76.66 per cent), lack of market for selling products (75.00 per cent), negligence by other family members regarding decision taken by women about economic development (73.34 per cent), unavailability of loans from banks in time (71.66 per cent), lack of regular training to members of SHGs (70.83 per cent) followed by uncertain market price for their produce and lack of freedom to take decision for self-travelling (66.66 per cent), equal treatment is not given by male family members (51.66 per cent). The other constraints faced by them with less importance were inability to operate personal saving account of bank (23.33 per cent), meetings are not organized in time (20.00 per cent), unequal treatment by chairman and secretary of SHG to their members (17.50 per cent), lack of co-operation amongst members of SHGs (12.50 per cent).

Table 1: Constraints faced by Women Members of Self Help Groups (SHGs) in their Empowerment

Sr. No.	Constraints	Frequency (n=120)	Per cent %
1.	High interest rate of loan	92	76.66
2.	Lack of market for selling products	90	75.00
3.	Negligence by other family members regarding decision taken by women about economic development	88	73.34
4.	Unavailability of loans from banks in time	86	71.66
5.	Lack of regular training	85	70.83
6.	Uncertain market price for their products	80	66.66
7.	Lack of freedom to take decision for self travelling	80	66.66
8.	Equal treatment is not given by male family members	62	51.66
9.	Inability to operate personal saving account of bank	28	23.33
10.	Meetings are not organized in time	24	20.00
11.	Unequal treatment by chairman and secretary of SHG to their members	21	17.50
12.	Lack of co-operation amongst members of SHGs	15	12.50
13.	Permission is not granted by family members to attend meetings of SHGs	12	10.00

Suggestions obtained by women to overcome the constraints

Suggestions obtained by the women members of SHGs to overcome the constraints were given in table no.2

Table 2: Suggestions obtained by women to overcome the constraints

S. N.	Suggestions	Frequency (n=120)	Per cent %
1.	Timely disbursement of loans	102	85.00
2.	Availability of loan at low interest rate	100	83.33
3.	Reasonable price for product	88	73.33
4.	Availability of market for selling produce	84	70.00
5.	Provision of timely training	80	66.66
6.	Freedom to take decision about self travelling	77	64.16
7.	Organization of SHG meeting in time	64	53.33
8.	Equal treatments should be given by male family members	52	43.33
9.	Equal treatment to all SHG members	50	41.66
10.	Cooperation from family	46	38.33
11.	Help to operate saving bank account	30	25.00
12.	Permission granted by head of family for attend the meetings of SHGs	10	8.33
13.	Good cooperation amongst members of SHGs	6	5.00

The different suggestions were obtained from the women members of SHGs to overcome the constraints were timely disbursement of loans (85.00 per cent), availability of loan at low interest rate (83.33 per cent), reasonable price for products (73.33 per cent), availability of market for selling of products (70.00 per cent) followed by provision of timely training (66.66 per cent), freedom to take decision about self travelling (64.16 per cent), organization of SHG meeting in time (53.33 per cent), suitable time and suitable venue of meeting (46.66 per cent), equal treatment should be given by male family members (43.33 per cent), equal treatment to all SHG members (41.66 per cent).

CONCLUSION

The study was concluded that the majority of the women members of SHGs faced the financial problems hence; the financial institution should make appropriate arrangements for quick disbursement of loan, moderate interest loan and sufficient amount of loan as per the project proposed by the SHGs.

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RESEARCH ARTICLE

Personal Characteristics of Agro Service Centers Entrepreneurs

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ABSTRACT

The present study was conducted mainly with the objective to know personal characteristics of agro service centers entrepreneurs. For the study, Latur district was selected purposely from Marathwada region on the basis of big market place for grains, oilseed and pulse crops. Five talukas viz Latur, Chakur, Renapur, Udgir and Shirur- anantpal were selected from these districts. Thus, 120 respondents constituting the total sample size. Ex-post facto research design was used for the study. Majority (62.50%) of the respondent of the proprietors were had middle age group, 77.50 per cent had college level of education and 25.00 per cent proprietors had B.Sc Agriculture graduates, 70.84 per cent had a professional experience. Further, majority (60.83%) of the proprietors were belongs from medium annual income group further 37.50 per cent of the proprietors were belongs from mass media exposure, two third of the proprietors were received different types of training, majority (50.83%) of the proprietors were had medium social participation and 47.50 per cent of proprietors from the medium extension contact. Most of the proprietors were in the cosmopoliteness and economic motivation category i.e. 72.50 per cent and 65.00 per cent, respectively.

Keywords *- Personal Characteristics of Agro Service Centers Entrepreneurs*

METHODOLOGY

The present study was conducted in purposively selected Latur district in Marathwada region of Maharashtra state. Latur is the gateway of southern market in Maharashtra, and it has more number of agro service centers s, as the market is big. The details about agro-service centers s in Latur district have been presented in table below.

Table 1: Number of Agro-Service Centerss in Latur district (2015-16)

Sr. No.	Panchayat Samiti/ Talukas	No. of ASCs
1	**Latur**	**500**
2	**Chakur**	**363**
3	Ahmadpur	119
4	Nilanga	155
5	**Udgir**	**237**
6	**Shirur - anantpal**	**201**
7	**Renapur**	**194**
8	Jalkot	118
9	Deoni	63
10	Ausa	81

The purposive selection of talukas Latur, Chakur, Renapur, Udgir, Shirur- anantpal was made on the criterion of more number of agro-service centers s and having license to sale seed, fertilizer and Insecticide was selected purposively located in these Talukas of Latur district in Marathwada region of Maharashtra State.

Selection of Agro-Service Centers

The base for selection of agro-service centers s was the location of agro-service centers s max agro service centers were observed at tahsils place .The list of all agro-service centers s in selected talukas was obtained from Agriculture Development Officer of respective talukas and Zilla Parishad Latur. Then from each talukas 24 agro service centers having license to sale seed, fertilizer and Insecticide was selected purposively. Thus, in all 120 agro-service centers of five tahsils constitute the sample of the respondents for the purpose of present study.

RESULTS AND DISCUSSION

The study of personal, socio-economical and psychological characteristics was made with reference to age, education, professional education, professional experience, annual income, mass

media exposure, training received, social participation, extension contact, and economic motivation. The results pertaining to the characteristics have been presented under following subheads.

1. Age

Table 3: Distribution of the respondents according to their age N = 120

Sr. No.	Categories	Frequency	Per cent
1.	Young	22	18.33
2.	Middle	75	62.5
3.	Old	23	19.17
		120	**100.00**

It is found from table 3 that more than half (62.50%) of the respondent were from middle age group followed by 19.17 per cent of the respondent were from old aged whereas, 18.33 per cent of the respondent were from young age group. This Finding is in line with that of Fuke (2011).

2. Education

The data from table 4 clearly shows that none of the proprietor were illiterate or primary school education, 10.83 per cent of them were had secondary education, 11.67 per cent had education up to higher secondary and 77.50 per cent of the proprietor were educated up to college level.

Table 4: Distribution of the respondents according to their education N=120

Sr. No	Education	Frequency	Per cent
1	Primary school	00	00.00
2	Secondary School	13	10.83
3	Higher secondary	14	11.67
4	College	93	77.50
	Total	**120**	**100.00**

3. Professional Education

Table 5:Distribution of the respondents according to their Professional education N= 120

Sr. No	Professional Education	Freq.	Per cent
1	Diploma of Agri-clinic and agril. business center	9	07.50
2	Agriculture Diploma	20	16.67
3	B. Sc. Chemistry	28	23.33
4	B.Sc. Agriculture	30	25.00
5	M.Sc. Chemistry	26	21.67
6	M sc. Agriculture	7	05.83
7	Ph.D.	00	00
	Total	**120**	**100.00**

The data regarding the professional education from table 6 clearly shows that, 07.50 per cent of proprietors were educated up to Diploma of agri-clinic and agril. business centers 16.67 per cent had education up to Agriculture Diploma, 23.33 per cent of them had B. Sc. Chemistry education 25.00 per cent of proprietors had B.Sc Agriculture education and 21.67 per cent of the proprietors were educated up to M.Sc. Chemistry and only 05.83 per cent were M sc. Agriculture holders, respectively none of the proprietors were Ph. D holders.

4. Professional experience

Table 6: Distribution of the respondents according to their Professional experience

Sr. No.	Categories	Frequency	Per cent
1	Low	16	13.33
2	Medium	85	70.84
3	High	19	15.83
	Total	**120**	**100.00**

It is found from table 7 that, more than half (70.84 %) of the proprietors were from medium level of professional experience followed by 15.83 per cent of the proprietors were from high level of professional experience whereas, 13.33 per cent of the proprietors were from low level of professional experience group.

5. Annual income

Table 7: Distribution of the respondents according to their annual income N = 120

Sr. No.	Categories	Frequency	Per cent
1	Low	19	15.83
2	Medium	73	60.83
3	High	28	23.34
	Total	**120**	**100.00**

The distribution of proprietors of agro-service centers s according to their annual income was presented in Table 8. It could be observed that, 60.83 per cent of the respondents had an annual income ranging from Rs.14.96,000-24,00,000 / followed by 23.34 per cent of the respondents were having annualincome from Rs.23,99,000/- and very few per cent 15.83 per cent proprietor respondents had annual income up to Rs.14,95,0000.

6. Mass media exposure

It is elucidated from table 9 that, majority (37.50%) of the proprietor had medium mass media exposure while, one third (35.00%) of them had high mass

media exposure. only, 27.50 per cent of proprietors were having low level of mass media exposure.

Table 8: Distribution of agro service center owners by the mass media exposure

Sr. No	Categories	Frequency	Per cent
1	Low	33	27.50
2	Medium	45	37.50
3	High	42	35.00
Total		**120**	**100.00**

7. Trainings received

Table 9: Distribution of agro service centers owners by the trainings received N=120

Sr. no.	Categories	Frequency	Per cent
1	Training received	97	80.83
2	Not received	23	19.17

The observation presented in table 10 indicated the status of trainings received by the respondents. Majority (80.83%) of the proprietors had got different types of training, while 19.17 per cent respondent proprietors of agro service centers had not attended any type of training programme.

8. Social participation

Table 10: Distribution of the respondents according to their social participation N = 120

Sr. No.	Categories	Frequency	Per cent
1	Low	26	21.67
2	Medium	61	50.83
3	High	33	27.50
	Total	**120**	**100.00**

The data from table 10 revealed that, a considerable proportion of the respondents 50.83 per cent had medium level of social participation, whereas, 27.50 per cent respondents had high social participation. About 21.67 per cent of the owners had low level of social participation.

9. Extension contact

It is evident from the table 11 that majority (47.50 per cent) of the proportion of the proprietors of agro–service centers s were having medium level of extension contact followed by more than one third (32.50%) of respondents comes under high level of extension contact and one-fourth (20.00%) of proprietors respondents comes under low level of extension contact. **N = 120**

Table 11. Distribution of the respondents according to their level of extension contacts N = 120

Sr. No.	Categories	Frequency	Per cent
1	Low	24	20.00
2	Medium	57	47.50
3	High	39	32.50
	Total	**120**	**100.00**

10. Cosmopoliteness

Table 12: Distribution of the proprietors according to their cosmopoliteness N= 120

Sr. No.	Categories	Frequency	Per cent
1	Low	11	9.17
2	Medium	87	72.50
3	High	22	18.33
	Total	**120**	**100.00**

Table 13 highlighted that, majority (72.50%) of the proprietors were in medium level of cosmopoliteness category, while 18.33 per cent of the proprietors were in high level of category of cosmopoliteness and 09.17 per cent of them were in low level category of cosmopoliteness.

CONCLUSIONS

Few (37.50%) of the respondent comes under medium level of mass media exposure about agricultural technologies but large number (80.83%) of respondents had attended training, had medium level of social participation, extension contact and cosmopoliteness.Majority (71.67%) of proprietors were in medium level of economic motivation.

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RESEARCH ARTICLE

Profile of Bank Agricultural Officers and Suggestions by them for Effective Job Performance

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ABSTRACT

Agricultural officers have been appointed in the banks so as to assist rural farming population. They are meant to appraise farm loan proposals and are the technical person with the ability to extensify farm technology and high-tech activities to the farming community. Effective job performance by them is the key for rural development which might be affected by their profile. Also different constraints may impede his performance. Hence, the research was undertaken to study profile of bank agricultural officers and to obtain different suggestions from them for their effective performance. 136 agricultural officers working in nationalized banks from Pune and Ahmednagar districts in Maharashtra state were selected as the respondents for research. The study indicated that majority of the respondents belonged young age (97.06 per cent), were postgraduate (68.38 per cent) with very low service experience (94.12 per cent), belonged to rural background (71.32 per cent), received less training (51.47 per cent), had low income (88.97 per cent), were having medium communication skill (52.94 per cent), medium information seeking behaviour (48.53 per cent), medium self-confidence (53.68 per cent), medium achievement motivation (53.67 per cent), high job involvement (48.53 per cent), moderate job stress (48.53 per cent), high availability of facilities (67.65 per cent) and good organizational climate (75.74 per cent). The major suggestions given by the respondents were revision of transfer policy (58.09 per cent), equal job policies for bank agricultural officers like general officers (55.88 per cent) and recruitment of adequate staff (52.94 per cent). They also suggested for better promotional opportunities, organizing training programmes and development of subvention software.

***Keywords:** Bank agricultural officers, profile, suggestions*

As financial institutions banks have significant contribution in the development process. With the realization of vital role of banks, government nationalized the banks with the major objective to expandthe horizon of commercial banking into rural areas. Since nationalization the flow of commercial bank credit to agriculture has been featured by increasing volume and growing diversification (Kulshestha and Yadav, 1984). Banks help in increasing productivity by providing credit for adoption of modern techniques so as to have marketable surplus for even small holdings. It provides opportunities for self-employment and gives assistance for taking up activities allied to agriculture. Thus, banks play an important role in prevention of migration of rural agricultural labour to urban areas.

Agricultural officer in banks is the person with whom rural people are at ease as he is from rural area and is well aware about rural atmosphere and their culture. The banks are in a great need of agricultural officers and even the higher authorities have realized their importance in rural and bank development. K. Laxman Rao, general manager for the priority-sector lending division at Union Bank of India says "Agricultural officer acts as a friend-philosopher and guide to farmers. Apart from helping farmers in harvesting, they also guide them to channelize their extra funds to banks, thus bringing business for us." Agricultural officers are the vital keys for the bank to carry out the rural business. It is, therefore, felt indispensable to study profile of bank agricultural officers and to obtain suggestions from them for improvement of their job performance.

METHODOLOGY

From Maharashtra state Pune and Ahmednagar districts had highest number of bank offices in rural and semi-urban sector. Hence these two districts were selected for conducting the present research. 136 bank agricultural officers formed the sample population of the study comprising 67 agricultural officers from Pune district and 69 agricultural officers from Ahmednagar district. The data in respect of different characteristics of respondents was obtained and on the basis of score obtained by them, they were categorized by using arbitrary method. Suggestions offered by the bank agricultural officers were ascertained by asking open end questions to them. Then the responses were enlisted and frequency and percentage for each suggestion was worked out.

RESULTS AND DISCUSSION

Profile of bank agricultural officers

The data about different personal, socio-economic, psychological and organizational characteristics of the respondent bank agricultural officers was collected and analyzed. The results obtained are presented in Table 1.

It is evident from the Table 1 that overwhelming majority (97.06 per cent) of the respondents belonged to young age group followed by old age (2.21 per cent) and middle age group (00.73 per cent). More than two-third (68.38 percent) of the respondents had completed their post-graduation while 29.41 per cent of them were graduates and very few (2.21 per cent) of them had obtained doctoral degree. In respect of service experience it was found that large majority (94.12 per cent) of the respondents belonged to very low service experience followed by 3.67 per cent and 2.21 per cent belonged to low and very high service experience category. The findings are in conformity to the results of Gaikwad (2010) and Hussain (2013). The results showed that majority (71.32 per cent) of the respondent bank agricultural officers were from rural background followed by semi-urban (24.27 per cent) and urban background (4.41 per cent). 28.68 per cent of the respondents had received four and above trainings while 25.74 per cent, 22.79 per cent and 21.32 per cent of them had one, two and three trainings, respectively. Very less per cent (1.47 per cent) of respondents had not received any training.

Table 1: Distribution of respondents according to their characteristics

Sr. No.	Characteristics	Category	Per cent
1.	Age	Young (Up to 35 years)	**97.06**
		Middle (36 to 47 years)	00.73
		Old (48 and above years)	2.21
	Education	Graduate	29.41
		Postgraduate	**68.38**
		Doctoral	2.21
3.	Service experience	Very low (Upto 7 years)	**94.12**
		Low (8 to13 years)	3.67
		Medium (14 to 19 years)	00.00
		High (20 to 25 years)	00.00
		Very high (above 26 years)	2.21
4.	Rural-urban background	Rural	**71.32**
		Semi-urban	24.27
		Urban	4.41
5.	Training	No training	1.47
		One training	25.74
		Two trainings	22.79
		Three trainings	21.32
		Four & above trainings	**28.68**
6.	Annual income	Low (Upto 5.33 Lakhs)	**88.97**
		Medium (5.34 to 7.66 Lakh	10.29
		High (above 7.67 Lakhs)	00.74
7.	Communication skill	Low (Upto 72 score)	18.38
		Medium (73 to 82 score)	**52.94**
		High (83 and above scores)	28.68
8.	Information seeking behaviour	Low (Upto 50 score)	20.59
		Medium (51 to 61 score)	**48.53**
		High (62 and above scores)	30.88
9.	Self confidence	Low (Upto 50 score)	5.88
		Medium (51 to 61 score)	**53.68**
		High (62 and above scores)	40.44
10.	Achievement motivation	Low (Upto 35 score)	38.24
		Medium (36 to 42 score)	**53.67**
		High (43 and above scores)	8.09
11.	Job involvement	Very less (Upto 47 score)	1.47
		less (48 to 56 score)	2.94
		Moderate(57 to 65 score)	38.24
		High (66 to 74 scores)	**48.53**
		Very high (75 & above))	8.82
12.	Job stress	Low (Upto 34 score)	43.38
		Moderate (35 to 50 score)	**48.53**
		High (51 and above scores)	8.09
13.	Facilities available	Less (Upto 13 score)	8.09
		Moderate (14 to 19 score)	24.26
		High (20 and above scores)	**67.65**
14.	Organizational climate	Poor (Upto 18 score)	2.94
		Fair (19 to 25 score)	21.32
		Good (26 and above)	**75.74**

Data gathered about annual income revealed that majority (88.97 per cent) of the respondents belonged to low income group while 10.29 per cent and 0.74 per cent of them had medium and high income respectively. More than half (52.94 per cent) of the respondents had medium communication skill followed by high (28.68 per cent) and poor communication skill (18.38 per cent). It was further observed that less than half (48.53 per cent) of the respondents belonged to medium information seeking behaviour however 30.88 per cent and 20.59 per cent of them had high and low information seeking behaviour, respectively.

The results about psychological characteristics of the respondents from Table 1 indicate that 53.68 per cent of the respondents belonged to medium self-confidence while 40.44 per cent and 5.88 per cent of them had high and low self-confidence, respectively. More than half (53.67 per cent) of them had medium achievement followed by low (38.24 per cent) and high achievement motivation (8.09 per cent). It was further observed that 48.53 per cent of the respondents had high job involvement while 38.24 per cent of them had moderate job involvement. In respect of job stress, 48.53 per cent, 43.38 per cent and 8.09 per cent of the respondents had moderate, low and high job stress, respectively. It is evident from Table 1that 67.65 per cent of the respondents had high availability of facilities where as 24.26 per cent of them had moderate availability of facilities. Also it was found that three-fourth (75.74 per cent) of the respondent bank agricultural officers had good organizational climate followed by fair (21. 32 per cent) and poor organizational climate (2.94 per cent).

Suggestions offered by bank agricultural officers

Various valuable suggestions given by the respondent bank agricultural officers to improve their job performance are presented in Table 2.

Table 2. Suggestions of the respondents for overcoming the constraints

Sr. No.	Suggestions offered	Respondents (N=136)	Per cent
1.	Revised transfer policy and posting in local area	79	58.09
2.	Equal policies like general officers	76	55.88
3.	Adequate staff with fixed roles and responsibilities	72	52.94
4.	Better career path by providing promotion opportunities	56	41.18
5.	Training programme on advanced agricultural technologies and banking aspects	52	38.24
6.	Subvention software for calculating subvention	47	34.56
7.	Necessary to stop debt waiver and relief by government to avoid NPA promotion	40	29.41
8.	All ferfar of 7/12 should be available online for quick search	34	25.00
9.	Government agencies should involve in recovery under government sponsored schemes	27	19.85
10.	NABARD's unit cost to be revised	27	19.85
11.	Recommendations and sanctioning powers should be in the hands of agri. background officers in case of agricultural proposals.	25	18.38
12.	Recovery procedure like sarfesia should be brought for agricultural loan for effective recovery of lending.	19	13.97
13.	Co-operation between agencies implementing government sponsored schemes and subsidy relating offices	14	10.29
14.	Proper allowance to meet daily expenditure	11	8.09
15.	Proper advertisement of banking schemes to farmers.	11	8.09

The data from Table 2 depicted that 58.09 per cent of the bank agricultural officers suggested for revising transfer policy with emphasis on posting in local area followed by equal job policies for agricultural officers as general officers for the provision of various facilities (55.88 per cent) and recruitment of adequate staff in banks for improving their job performance (52.94 per cent). 41.18 per cent and 38.24 per cent of them suggested for providing better promotional opportunities and organizing training programmes for upgrading their knowledge and skills, respectively. Further it was observed that 34.56 per cent and 29.41 per cent of the respondents suggested that subvention software should be

developed for calculating subvention and debt waiver and relief schemes should be minimized or stopped completely to reduce NPA and to improve their performance in the area of credit appraisal.

One-fourth (25.00 per cent) of the respondent bank agricultural officers recommended for online availability of all ferfar of 7/12 while equal per cent (19.85 per cent) of them suggested that government agencies should involve in recovery under government sponsored schemes and revision of unit cost by NABARD. Further 18.38 per cent, 13.97 per cent and 10.29 per cent of the bank agricultural officer expressed that recommendations and sanctioning powers should be in the hands of agricultural background officers for agricultural proposals, recovery procedure like surfesia should be brought for agricultural loan for effective recovery and co-operation between agencies implementing government sponsored schemes and subsidy relating offices. Equal per cent (8.09 per cent) of them expressed to have proper allowance to meet daily expenditure and proper advertisement of banking schemes to the farmers.

CONCLUSION

The results about profile of the respondents indicated that majority of them belonged to young age, were postgraduates with very low service experience, belonged to rural background ,received less training, had low income, medium communication skill, medium information seeking behaviour, medium self-confidence, medium achievement motivation, high job involvement, moderate job stress, high availability of facilities and good organizational climate.

It is necessary to undertake appropriate measures by the bank organization such as revising transfer policy, undertaking equal job policies for both general officers and agricultural officers in the bank, appointment of adequate staff, providing training to the bank agricultural officers and development of appropriate softwares to lower workload as suggested by the bank agricultural officers to improve their efficiency and overall job performance.

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RESEARCH ARTICLE

Polyhouse Owners Knowledge regarding Protected Cultivation Technology

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ABSTRACT

Agriculture and allied sectors contributes 24% of the total GDP and provides employment to around 67% Indian population Indian farmers face several challenges such as small land holding, poor yields due to reliance on inefficient methods of farming, too much reliance on natural phenomena such as rainfall and lack of knowledge of modern methods of agriculture. The study about overall adoption of Gerbera Ployhouse technology revealed that more than half of the respondents (66.67 per cent) had medium level of adoption, followed by 33.33 per cent respondents having low level of adoption. Not a single respondent had high level of adoption about Gerbera polyhouse technology. Currently, farmers are taking interest in polyhouse farming. Polyhouse farming process requires expertise in three areas - construction of the structure, cultivation techniques and marketing. Within cultivation, the pre-harvest techniques include irrigation, providing fertilizers, pesticides and micro-nutrients, maintaining temperature, humidity and sunlight in the polyhouse, cutting, pruning and cleaning practices and controlling pH and electrical conductivity of the soil. The post-harvest techniques include cutting, storage cooling chambers and transport by cooling vans. On the basis of findings of the study it is suggested that the long duration trainings (minimum 15 days) needs to be organized by the Agriculture Universities and State Department of Agriculture for the polyhouse owners so as to reduce high cost of private consultancy services. Typical Ployhouse are from 500 square meters to 10,000 square meters, which makes suitable for farmers with small land holding. The polyhouse differs in terms of cost on the basis of type. Government of India gives 50% subsidy for low cost polyhouse, 20% for medium cost polyhouse and 10% for high cost polyhouse as an incentive. The Gujarat Govt. provides the flat subsidy rather than the type of polyhouse. As per the suggestions of the polyhouse owners the Maharashtra Govt. also provide the subsidy on the line of Gujarat Govt.

Keywords: *Protected cultivation, Polyhouse*

Knowing and realizing the importance of polyhouse technology, the polyhouse units at farmer's level as an enterprise are increasing day by day. In Maharashtra, particularly Pune district is leading in protected cultivation of flowers and vegetables. Considering these issues the present study was undertaken with the objectives- To study the level of knowledge and management practices followed by Polyhouse owners, to know the constraints experienced by the Polyhouse owners, to obtain the suggestions of the Polyhouse owners.

METHODOLOGY

The present study conducted in the three tahsils Baramati, Haveli and Bhor in Pune District. Total 36 respondents were selected for the study and from these six (6) respondents from each tahsil were Gerbera growers

RESULTS AND DISCUSSION

The data from table 1 revealed that the cent percent of the respondents had the knowledge and adoption of the recommended soil requirement, land preparation, size of bed, variety, transplanting time, planting distance and following the recommended inter culturing operations for Gerbera. Regarding water management practices all had following the drip and other irrigation practices. As regards plant protection majority of the farmers (77.76 per cent) having knowledge and adoption about control of insects like Mites, Thrips and diseases like powdery mildew. Nearly all the respondents 94.44 per cent having knowledge of control measures for *Leaf*

Minor. Considering the harvesting and storage practices, cent percent farmers having knowledge and adoption about harvesting time, method and packaging material. All the respondent farmers following the recommended gradation practice, production, and all were having knowledge about the plant population.

1. Knowledge and Adoption

Gerbera cultivation technology:

Table - 1: Practice wise Knowledge and Adoption of farmers about Polyhouse technology for Gerbera

Sr. No.	Improved Practice	Knowledge level (n=18)			Adoption level (n=18)		
		Complete	Partial	No	Complete	Partial	No
1	**Medium (Soil/ Cocopit)**	18 (100.00)	0 (00.00)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
2	**Soil**						
	1) Well Drained	18 (100.00)	0 (00.00)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
	2) PH (5.5 to 6.5)	15 (83.33)	3 (16.87)	0 (00.00)	14 (77.78)	4 (22.22)	0 (00.00)
3	**Land Preparation**						
	1. Red Soil	18 (100.00)	0 (00.00)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
	2. Soil Sand Compost (2:1:1)	17 (94.44)	1 (5.56)	0 (00.00)	17 (94.44)	1 (5.56)	0 (00.00)
	3. Size of Bed 75cm W X 30-45cm H	18 (100.00)	0 (00.00)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
	4. Fumigation 3% Formalin	14 (77.78)	4 (22.22)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
4	**Seedling Treatment** Carbanzim 0.1 % 2 min	14 (77.78)	4 (22.22)	0 (00.00)	14 (77.78)	3 (16.67)	1 (5.56)
5	**Variety** Aronla, Dyblow, Sawana, Ranoflek, Dalna, Pink Theling etc.	18 (100.00)	0 (00.00)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
6	**Transplanting Time** July-Aug	18 (100.00)	0 (00.00)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
7	**Planting Distance**						
	1. 30 X 30 cm	18 (100.00)	0 (00.00)	0 (00.00)	16 (88.89)	2 (11.11)	0 (00.00)
	2. Distance bet. 2 Beds- 50cm	12 (00.00)	6 (33.33)	0 (00.00)	14 (77.78)	4 (22.22)	0 (00.00)
	3. Plants per Guntha	16 (88.89)	2 (11.11)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
	4. Size of Bed L & W X 90cm	18 (100.00)	0 (00.00)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
8	**Environment Control**						
	1. Day Temp. 22^0c - 25^0c	0 (00.00)	17 (94.44)	1 (5.56)	11 (61.11)	7 (38.89)	0 (00.00)
	2. Night Temp 20^0c - 22^0c	9 (00.00)	6 (33.33)	3 (16.67)	13 (72.22)	5 (00.00)	0 (00.00)
	3. Humidity 60-70% Use fogger	7 (38.89)	11 (61.11)	0 (00.00)	7 (38.89)	8 (00.00)	3 (16.67)
9	**Fertilizes Management**						
	1. NPK Planting Time 20:20:15	12 (66.67)	5 (27.78)	1 (5.56)	12 (66.67)	6 (33.33)	0 (00.00)
	2. NPK / Month 10:15:20 for three month	12 (66.67)	5 (27.78)	1 (5.56)	12 (66.67)	6 (33.33)	0 (00.00)
	3. NPK after 3 Months 15:10:30	12 (66.67)	5 (27.78)	1 (5.56)	12 (66.67)	6 (33.33)	0 (00.00)

S.N.	Improved Practice	Knowledge level (n=18)			Adoption level (n=18)		
		Complete	Partial	No	Complete	Partial	No
	1.Remove dry leaves	18 (100.00)	0 (00.00)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
	2. Hoeing once a month	18 (100.00)	0 (00.00)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
	3. Remove off type buds/flowers	18 (100.00)	0 (00.00)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
11	**Water Management**						
	1. Drip Irrigation- 700ml/plant/day	14 (77.78)	4 (22.22)	0 (0.00)	14 (77.78)	4 (22.22)	0 (0.00)
	2. Watering with Zari (21 days)	18 (100.00)	0 (0.00)	0 (0.00)	15 (83.33)	3 (16.67)	0 (0.00)
12	**Plant Protection**						
	1. Nematode	1 (5.56)	2 (11.11)	15 (83.33)	3 (16.67)	0 (0.00)	15 (83.33)
	2. Karpa	4 (22.22)	12 (66.67)	2 (11.11)	6 (33.33)	10 (55.56)	2 (11.11)
	3. Powdery Mildew	14 (77.78)	4 (22.22)	0 (0.00)	14 (77.78)	4 (22.22)	0 (00.00)
	4. Kevada	1 (5.56)	9 (50.00)	8 (44.44)	3 (16.67)	6 (33.33)	9 (50.00)
	5. Mites	14 (77.78)	4 (22.22)	0 (00.00)	14 (77.78)	4 (22.22)	0 (00.00)
	6. Thrips	14 (77.78)	4 (22.22)	0 (00.00)	14 (77.78)	3 (16.67)	1 (5.56)
	7. White fly	12 (66.67)	6 (33.33)	0 (00.00)	12 (66.67)	4 (22.22)	2 (11.11)
13	**Harvesting and Storage**						
	1. Centre colour	15 (83.33)	0 (00.00)	3 (16.67)	15 (83.33)	0 (00.00)	3 (16.67)
	2. Standing pollens	14 (77.78)	4 (22.22)	0 (00.00)	17 (94.44)	1 (5.56)	0 (00.00)
	3. Harvesting at Morning/Evening	18 (100.00)	0 (00.00)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
	4. Use water bucket	12 (66.67)	6 (33.33)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
	5. Harvesting method	18 (100.00)	0 (00.00)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
	6. Use of polythene for packing	18 (100.00)	0 (00.00)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
	7. Storage at 4^{o}c	2 (11.11)	11 (61.11)	5 (27.78)	1 (5.56)1	0 (00.00)	17 (94.44)
14	**Grading**						
	1. Same size	18 (100.00)	0 (00.00)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
	2. Straight stem	18 (100.00)	0 (00.00)	0 (00.00)	17 (94.44)	1 (5.56)	0 (00.00)
	3. Length and diameter of stem - 40cm	15 (83.33)	3 (16.67)	0 (00.00)	14 (77.78)	4 (22.22)	0 (00.00)
15	**Production**						
	1. Production per plant 30-40 flowers	15 (83.33)	3 (16.67)	0 (00.00)	15 (83.33)	3 (16.67)	0 (00.00)
	2. Plants Per guntha (0.1 ha.)	18 (100.00)	0 (00.00)	0 (00.00)	18 (100.00)	0 (00.00)	0 (00.00)
	3. Flowers per guntha (0.1 ha.)	16 (88.89)	2 (11.11)	0 (00.00)	16 (88.89)	2 (11.11)	0 (00.00)

II Overall knowledge and adoption of the respondents about polyhouse technology

A. Gerbera cultivation technology

Table - 2 Overall Knowledge of the respondents about Gerbera Cultivation Technology

Sr. No.	Category	Nos.	Percent
1.	Low (Score Up to 75)	4	22.22
2.	Medium (Score 76-88)	11	61.11
3.	High (Score 89 and Above)	3	16.67

From the results, it is observed that majority (61.11 per cent) of the respondents possessed medium level of knowledge about gerbera polyhouse technology. About 22.22 per cent of the respondents had low knowledge and only 16.67 per cent respondents had high level of knowledge about Gerbera polyhouse technology.

Table – 3 Overall Adoption of the respondents about Gerbera Cultivation Technologies

Sr. No.	Category	Nos.	Per cent
	Low (Score Up to 75)	6	33.33
	Medium (Score 76-95)	12	66.67
	High(Score 96 and Above)	0	0.00

The results regarding overall adoption of Gerbera polyhouse technology more than half of the respondents (66.67 per cent) had medium level of adoption, followed by 33.33 per cent respondents having low level of adoption. Not a single respondent had high level of adoption about Gerbera polyhouse technology.

CONCLUSION

The results regarding the pre-harvest techniques include irrigation, providing fertilizers, pesticides and micro-nutrients, maintaining temperature, humidity and sunlight in the polyhouse, cutting, pruning and cleaning practices and controlling pH and electrical conductivity of the soil. The post-harvest techniques include cutting, storage cooling chambers and transport by cooling vans. On the basis of findings of the study it is suggested that the long duration trainings (minimum 15 days) needs to be organized by the Agriculture Universities and State Department of Agriculture for the polyhouse owners so as to reduce high cost of private consultancy services. Typical Ployhouse are from 500 square meters to 10,000 square meters, which makes suitable for farmers with small land holding. The polyhouse differs in terms of cost on the basis of type. Government of India gives 50% subsidy for low cost polyhouse, 20% for medium cost polyhouse and 10% for high cost polyhouse as an incentive. The Gujarat Govt. provides the flat subsidy rather than the type of polyhouse.

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RESEARCH ARTICLE

Body Mass Index of Female Police Constables Engaged in Shift Work

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ABSTRACT

The research investigates the Body Mass Index (BMI) of Female Police Constables (FPCs) of Kota region. The study used the data obtained by 101 FPC who have been engaged in shift work for over 6 months and lie within 18-60 years of age; classified in Group I (18-30 yrs), Group II (31-45yrs), Group III (above 45 yrs). Assessment of BMI reveals that 73.6% of population has normal BMI, as in Age group I (18-30 years) maximum number of subjects (91.2%) was having Normal weight whilst 8.8% were classified as Underweight. In the Age group II (31-45 years), 93.9% of subjects were Normal Weight although (6.1%) were found to be Overweight. Under the Age group III (>45 years) (82.4%) weigh Normal whereas 14.7% were overweight and remaining 2.9% were classified as Class I Obese. However mean BMI of age group I (18-30yrs) is 20.52, age group II (31-45yrs) is 21.85 and age group III is 23.12 which demonstrate direct relation with increase in age and enhanced BMI in all the age groups.

Keywords: *Body Mass Index and Female Police Constables*

According to International Labor Office (ILO) Shift work is defined as – A method of work organization under which a group or crew of workers succeed each other at same workstation to perform the same operation each crew working in a certain schedule or shifts so that the undertaking can operate longer than the stipulated weekly hours of any worker.

Shift work is a necessary element of police life as the public requires police service to be available 24 hours a day, seven days a week, 365 days a year because shift work is viewed by police officers as one of their most potent stressor[1]. In a democratic country like India, police is the prime agency responsible for the prevention, detection and investigation of crime, where state is directed to work towards the welfare and satisfaction of people and requires its police system to be humanized one with cordial and friendly relations between police and community wide [2]. Thus shift work under these conditions is unavoidable.

The literature reports that Shift work, in particular including night work, can have a negative impact on workers health that arises from living in misalignment with the circadian clock [3-6].Elevated levels of BMI are associated with serious diseases, general health impairment along with accidents and injuries at work. [7-8]. As people work irregular hours, their daily routine is interrupted, thus regular eating and exercise habits are difficult to maintain [9]. Hence, shift workers have a higher prevalence of being overweight and gaining weight [1,10-11]. Shift workers have shown higher waist-to-hip ratio (WHR) (i.e. more central fat) than day workers, independently of BMI [12]. Overweight contributes to circulatory diseases, diabetes mellitus and various forms of cancer along with cardiovascular diseases [13-14].

High BMI leads to mismatch between Psycho physiological functions and environmental synchronizers, which disrupt biological rhythms and cause health problems mainly: sleep disorders, chronic fatigue, neuropsychological problems, digestive, cardiovascular diseases and loss in women's reproductive functions.[4,15]. However women shift workers (those married with small children) reported having more difficulties with sleep and chronic fatigue

METHODOLOGY

Participants

FPCs of Kota city were approached at the Head Police Station for the study. 150 FPCs were surveyed with minimum 6 months of job experience. But prior to statistical analysis 49 were excluded. . 25 were disqualified from the study because of their belonging to RAC (Rajasthan Armed Constables) with different nature of work than Civil Police constables. The data of 13 subjects were too incomplete that it cannot be recovered on telephone from subjects and some of these subjects have not provided phone number either. In addition 11 subjects debarred because they were not engaged in night shift.

Table 1 Profile of respondents

Attribute	Characteristics	Per cent
Age	18-30	33.66
	31-45	32.67
	45 above	33.66
Marital Status	Single	16
	Married	64
	Divorced	10
	Separated	3
	Widow	7
Job Experience	0-10 years	46.5
	11-20years	16.8
	21-30years	26.7

From Table 1, it can be derived that the sample is almost equally distributed among all the age groups. Majority of respondents (64%) are married and approximately half i.e. (46.5%) of the study sample have less than 10 years of job experience.

Tools and Techniques:

The study investigated Body Mass Index of FPCs. Body Mass Index (BMI) of subjects was calculated by using their height and weight. The formula used for BMI- Weight in Kg/height in m2

Weight- The weight of the subject was taken with minimum clothing and without footwear. A standardized weighing scale was used (Detecto Medic Detecto scales Inc. Brroklyn, N.Y., USA) which was calibrated to 0 mass. The subjects were asked to stand on the platform of the scale looking straight ahead. The weight was recorded in Kg to the nearest 0.5 Kg.

Height- Height will be measured using a standardized non-stretchable tape without footwear. The subjects were asked to stand with their heel, buttocks, shoulders and head touching the wall. The head was held straight and a thin ruler was held at the top of the head right at the centre. While BMI status assessed by standard classification shown in Table 2.

Table: 2 BMI Index.

Classification	BMI
Underweight	< 18.50
Normal range	18.50 - 24.99
Over weight	25.00-29.00
Obese Class I	30.00-34.99
Obese Class II	35.00-39.99
Obese Class III	40.00

RESULTS AND DISCUSSIONS

The findings of this research suggest that the shift system causes a number of problems for FPCs

Table 3: Body Composition of Constables According to the Age Group

Age (Years)	Under Weight (%)	Normal Weight (%)	Over weight (%)	Obese Class I (%)
18-30	8.8	91.2	0	0
31-45	0	93.9	6.1	0
>45	0	82.4	14.7	2.9

Table 4: BMI Of Constables Based On Different Age Groups.

Age	Variables		
	Body Weight (Kg)	Height (meters)	BMI
A1=(18-30years)	53.62	1.615	20.5
A2=(31-45 years)	57.26	1.618	21.9
A3=(above 45 years)	60.07	1.61	23.1

*Values expressed indicates Mean of respective variable.

The collected data was summarized by using percentage, range and findings of the study having presented in the form of tables.

Table 3 depicts the prevalence of Obesity among FPCs engaged in shift work advances with the age. It was observed that in Age group I (18-30 years), maximum number of subjects (91.2%) was having Normal weight whilst 8.8% were classified as Underweight. In the Age group II (31-45 years), 93.9% of subjects were Normal Weight although (6.1%) were found to be Overweight. Under the Age group III (>45 years) (82.4%) weigh Normal whereas 14.7% were overweight and remaining 2.9% were classified as Class I Obese. Though none of the subject falls under class II and III obesity.Maximum number of subjects from each group was classified as Normal Weight, whereas 17.6% of subjects were found with high level of BMI and 8.8% of subjects had Low BMI.

Based on table 4, average BMI of age group I (18-30yrs) is 20.52, age group II (31-45yrs) is 21.85 and age group III is 23.12 which demonstrate the inclination of BMI among FPCs with the advancement of age, whichaffirms that the age and years of shift work exposure impact the BMI [16].

Thus it can be concluded that shift work is considered to be directly responsible for excess weight or body fatness [17-18].Another study states that the states that the BMI was predicted by the main effects of age and years of shiftwork exposure, which is affirmed by 2.9% of Class I Obese and 14.7% of Overweight of above 45 years of constables with high work experience. Other study concluded that a longer exposure to shift work predicts higher BMI [19]. Also job stress and long working hoursseemto contribute to an increase in BMI [20].

However large number of FPCs found to have normal BMI due to excessive physically demanding nature of the job which requires them to stand and walk for long duration in the shift, also during the time of emergency or crisis shift system gets hampered leading to the intense physical exhaustion, thus not allowing them to gain weight irrespective of the age and exposure to shift work.

1. CONCLUSION

Study reveals that the BMI has shown tendency to increase with the advancement of age and exposure of shift work. However in 73.6% of FPCs, BMI was found normal due to excessive physical activeness. Thus it can be concluded that effects of shift work on BMI or obesity can be adjourn or delay with physically active lifestyle.

Study suggests few pointers which would help in reducing the impact of shift work:

- FPCs with children younger than 5 years should not be given night shifts.
- Implementing only eight hours by minimizing overtime and reallocating workloads.
- Night shift followed by weekend holiday to overcome the sleep loss.

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RESEARCH ARTICLE

Impact of Training Programme on Knowledge of Bio fertilizers by Farmers

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ABSTRACT

To increase knowledge and technology adoption several efforts have been made and it is found that various training programmes helps in dissemination of agricultural technology with greater speed thus showing training of farmers as critical input for rapid transfer of agricultural technology. As training's on biofertilizer use techniques were given in the area, the present investigation is therefore under taken to know the impact of farmers training programmes on knowledge which ultimately helps in increasing the productivity with specific objectives as to study the impact of training programme on knowledge gained about biofertilizer use practices by the respondents and to study relationship between, socio-economic characteristics of respondents with knowledge of biofertilizers use practices. The knowledge about bio-fertilizer use practices indicated that in case of trained farmers majority of them had medium knowledge level where as relatively higher no. of trained farmers were seen in high knowledge level category. Regarding the untrained farmers, most of them had medium level of knowledge but relatively more number of farmer came under low level of knowledge. The calculated value of `Z' was 9.541 which was found to be significant at 0.01 level of probability indicating that there is highly significant difference between trained and untrained farmers with respect to knowledge level. The findings show the impact of farmers training programmes of Krishi Vigyan Kendra on knowledge about bio-fertilizer use practices. In relational analysis it was observed that characteristics of trained and untrained farmers namely education, land holding, socio-economic status, mass media exposure, extension contact and risk orientation were positively and significantly related to knowledge about bio-fertilizer utilization practices, where as age showed non significant relationship with the knowledge. It was indicated that all these variables reflect on behaviour of an individual to get acquainted with bio-fertilizer utilization practices.

METHODOLOGY

In order to assess the impact of farmers training programmes of Krishi Vigyan kindras and Adult education department on knowledge and adoption of improved practices of bio-fertilizers the Krishi Vidyan kendra from Marathwada Agricultural University, Parbhani, located at Aurangabad was selected because considerable number of farmers training programmes with respect to bio-fertilizers were conducted during 1998-99. Number of villages were covered for imparting various training programmes, list of these villages was obtained from Adult Education Department. The villages were training programme on bio-fertilizers were carried out selected purposively. Six villages having more number of trained farmers were selected purposively. They are as follows Ambehol Gajgaon Malunja (khr.) Malunja (Brk.) Manjari Bhendala From these selected villages maximum ten trained farmers in each village were included and the similar number of untrained farmers were selected from same villages. Thus sample of the study consist of 60 trained and 60 untrained farmers. The total sample constituted of 120 respondents for the present study.The analysis of data was carried out by using frequencies, percentages and means, various descriptive and inferential statistics on the different aspects of the study. The details about the

statistical techniques and test used are summarized below. The mean and standard deviation of distribution was worked out and the categories like low, medium and high were formed on the basis of mean and standard deviation values i.e. $X \pm SD$ and in some cases, quantitative classes were formed arbitrarily. The comparison between trained and untrained farmers with respect to their characteristics, knowledge level and adoption level was done by student `Z' test for testing the mean difference. Multiple regression analysis was also carried out to ascertain the contribution of selected independent variables towards the variation in the knowledge and adoption level of trained and untrained farmers. The significance of calculated 'r' and R^2 values was ascertained at 0.01 and 0.05 level of probability Statistical tests used for interpretation of data besides the percentage.

RESULT AND DISCUSSION

Knowledge and adoption level of trained and untrained farmers.

The knowledge about bio-fertilizer utilization practices possessed by trained and untrained farmers is presented in table 1.

It was observed that 81.66 per cent of the trained and 41.66 per cent of the untrained farmers were knowing the meaning of bio-fertilizer. From the trained farmers 75.00 per cent respondents were knowing different groups of bio-fertilizers and only 36.66per cent of the untrained farmers were keeping knowledge about different groups of bio-fertilizers. Regarding the information about meaning and various kinds of `N' fixing bio-fertilizers 90.00 per cent of the trained and 66.66 per cent of untrained farmers were knowing. Eighty-five per cent of trained and 71.66 per cent of untrained farmers were knowing the crops to which the `N' fixing bio-fertilizers are recommended. About 65.00 per cent of trained and 45.00 per cent of untrained farmers were about the care to be taken while purchasing the bio-fertilizer bags. Case was that about 91.66 per cent of trained and 80.00 per cent of untrained farmers were knowing about weight of bags in which the bio-fertilizers are available in market.

As regards to recommended dose of bio-fertilizers 61.66 per cent of trained and only 30.00 per cent of untrained farmers were knowing the information. The method of treating seed/seedling with bio-fertilizer was known to 95.00 per cent of the trained and 73.33 per cent of untrained farmers. In case of the time of treatment i.e. when the seeds/seedlings should be treated and for what time they should be kept with, the information was known to 71.66 per cent of trained and 48.33 per cent of untrained farmers.

Table.1 Distribution of trained and untrained farmers according to knowledge of biofertilizer use practices.

Sr. No.	Particulars	Trained farmers		Untrained farmers	
		No.	Per cent	No.	Per cent
1.	Meaning of Bio-fertilizers	49	81.66	25	41.66
2.	Different groups of bio-fertilizers	45	75.00	22	36.66
3	Meaning and kinds of `N' fixing bio-fertilizers	54	90.00	40	66.66
4	Utilization methods of different `N' fixing bio-fertilizers (Rhizobium, Azatobacter, Azospirrullum)				
a	Crops to which `N' fixing bio-fertilizers are recommended	51	85.00	43	71.66
b	Care to be taken while purchasing the bio-fertilizer bag	39	65.00	27	45.00
c	Weight of bag	55	91.66	48	80.00
d	Recommended dose	37	61.66	18	30.00
e	Method of treating seed/seedling with bio-fertilizers	57	95.00	44	73.33
f	Time of seed treatment before sowing	43	71.66	29	48.33
g	Use of sticking agent	53	88.00	34	56.66
h	Seed treatment with fungicide	29	48.33	18	30.00
i	Place of drying of treated seed	57	95.00	41	68.33
j	Use of chemical fertilizers and bio-fertilizers	44	73.33	29	48.33
5	Utilization of composting bio-fertilizers				
a	Meaning of composting bio-fertilizers	39	65.00	22	36.66
b	Recommended dose of composting bio-fertilizers	37	61.66	16	26.66

About the use of the sticking agent, 88.00 per cent of the trained respondents were knowing, comparatively low percentage (56.66 per cent) of the untrained respondents were knowing about sticking agents. Information regarding the seed treatment with fungicide was known to 48.33 per cent of trained and 30.00 pre cent of the untrained respondents, knowledge about place of drying of seeds treated with bio-fertilizers was possessed by 95.00 per cent of trained farmers to that of only 68.33 per cent of untrained farmers were knowing about this. As regard to the use of chemical fertilizer and bio-fertilizers i.e. if they are to be used together or separately, 73.33 per cent of trained and only 48.33 per cent of untrained were aware of the information.

Table .2 Distribution of trained and untrained farmers according bio-fertilizers use practices.

Sr. No	Category	Trained farmers		Untrained farmers	
		No.	Per cent	No.	Per cent
1.	Low	5	8.33	19	31.66
2.	Medium	38	63.33	32	53.33
3	High	17	28.33	9	15.00

It was evident from table 2 that majority i.e. 63.33 and 53.33 per cent of the respondents from both the categories of trained and untrained farmers, respectively were located in medium knowledge level group. About 28.33 per cent of trained and 31.66 per cent of untrained farmers were located in high and low knowledge level group, respectively. Whereas only 8.33 per cent of trained and 15.00 per cent of untrained farmers were grouped in low and high knowledge level category.

Mean Knowledge score of trained and untrained farmers:

A persual of data revealed that the mean knowledge score of trained and untrained farmers comes to 24.70 and 15.60, respectively. The calculated 'Z' value of difference between the means of two sample (9.541) was found to be highly significant. Hence it can be concluded that, there is highly significant difference amongst the knowledge of both the respondents. Relationship between selected characteristics of trained and untrained farmers and their knowledge level

Table .3 Differences in mean knowledge score of trained and untrained farmers about bio-fertilizers use practices.

Sr. No.	Items	Trained farmers	Untrained farmers	'Z' value
1.	No of respondents	**60**	**60**	**9.541****
2.	Mean of knowledge score	**24.70**	**15.60**	
3	Variance	**12.24**	**42.29**	

CONCLUSION

The knowledge about bio-fertilizer use practices indicated that in case of trained farmers majority of them had medium knowledge level where as relatively higher no. of trained farmers were seen in high knowledge level category. Regarding the untrained farmers, most of them had medium level of knowledge but relatively more number of farmer came under low level of knowledge. The calculated value of `Z' was 9.541 which was found to be significant at 0.01 level of probability indicating that there is highly significant difference between trained and untrained farmers with respect to knowledge level.

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Dr. V. S. Shirke
Secretary, MSEE

Report of the Secretary for the year 2016

Dear Members,

I take this opportunity with immense pleasure to present the progress report of Maharashtra Society of Extension Education before the distinguished members of the society.

The Maharashtra Society of Extension Education was formed in the year 1980 at the College of Agriculture, Nagpur and registered in the year 1982 with the strong and motivated initiative of the founder members Dr. R.R. Sinha, Dr. V.R. Kubde and Dr. D.M. Nikhade. The society was established with the following objectives.

1. To publish a scientific journal devoted to the research in the field of extension education
2. To organize National level seminars, workshops, conferences on various need based aspects in extension education to come out with valuable recommendations for national and state level policy makers
3. To institutionalize and award various prizes to encourage and improve professional competence of students, researchers and teachers

Ever since its inception, the society has made formidable progress and has come to the forefront with the inspiration and able guidance of Dr. A.G. Sawant, President, Dr. R.R. Sinha and Dr. K.D. Kokate,Vice-Presidents, all stalwarts and internationally acknowledged scientists in the field of extension education. The society has been regularly organizing events like national seminars and publishing its journal. The Maharashtra Journal of Extension Education has been renamed as Asian Journal of Extension Education and is being published with its new name since 2004 in continuation with its earlier volume numbers. During last year we have published Journal volume of the year 2014 and during this current year the volume for the year 2015 has been published.

During the Annual General Body meeting of the society held at Goa on September 26, 2008, it was decided to shift the office of the MSEE from the Directorate of Extension Education, MPKV, Rahuri to the Division of Extension Education at College of Agriculture, Pune.

NAAS Rating of the Journal:
I am very glad to inform that the proposal for NAAS Rating of the Journal was made to the ICAR. The sincere efforts were made to comply the formalities thereof. However, it is proud to know to all our dignitaries, officials and members of the Society that the Asian Journal of Extension Education has been NAAS Rated as 3.70 by the ICAR in the year 2016.

It also gives me immense pleasure to inform the members that the Society has started its website and was inaugurated at the hands of Dr. K.D. Kokate, Hon'ble DDG, ICAR during National Seminar held at DBSKKV, Dapoli on 5th March, 2010. In order to facilitate paperless fast and efficient submission of research articles for publishing in the journal and all other related correspondence, the **e-mail** address of the society **ajeepune@gmail.com** has been started and being used for communication and correspondence.

On the financial scenario, presently the society has capital funds worth Rs. 88440 (2016-17) along with fixed deposits worth Rs.1,54,000/- in all.
I am confident that with the farsighted leadership at the helm of this society, it shall continue to grow, progress and prosper at an accelerated pace.

I wish to appreciate the painstaking efforts made by my colleagues Dr. V. J. Tarde, Treasurer, Dr. H. P. Sonawane, Joint Secretary and Shri. S. S. Neware in bringing out this issue of the Asian Journal of Extension Education for the years 2015. I sincerely thank the members of the Executive Body of MSEE and Editorial Board of the Asian Journal of Extension Education and the distinguished members of MSEE for their whole hearted co-operation and encouragement towards the noble cause of the society.

Pune
Dec. 2016

V. S. Shirke

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