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ABOUT THE SOCIETY

MOBILIZATION Society was established in 2003 as an non-profit professional society aimed at sensitizing and mobilizing development partners and community for sustainable development. The Society, during these ensuing years has successfully mobilized researchers, academicians, planners, grass root mobilizers and student and created conducive intellectual atmosphere for introspective deliberations and conducted National seminars/workshop to address the emerging problems experienced by the agrarian mass. Presently the Society has 822 Life Members. The recognition of the Society in the efforts for strengthening the forum for scientific communication is growing among the related professionals and concerned agricultural stakeholders rapidly. The Society works on following objectives-

1. To document the on-farm and adaptive research experiences in multi- disciplinary agri-bio sciences and extension education.
2. To offer a platform for sharing the empirical experiences of development professionals, community mobilizers, academicians, multi-sectoral researchers, students etc. for the benefit of ultimate users.
3. To facilitate close and reciprocal linkage among the institutions for sustainable rural development.
4. Promoting potential and practicing entrepreneurs.
5. To disseminate the documented knowledge to the global partners through approach abstracting and indexing.

ABOUT THE JOURNAL

Journal of Community Mobilization and Sustainable Development (print ISSN 2230 – 9047; online ISSN 2231 – 6736) is published by Society for Community Mobilization for Sustainable Development twice a year. The *Journal of Community Mobilization and Sustainable Development* has NAAS rating 3.1. The *Journal of Community Mobilization and Sustainable Development*, is also available on our website www.mobilization.co.in and it has been registered with www.indianjournal.com for national and global abstracting and indexing. MOBILIZATION envisages reorienting the young professionals and researches for imbibing the values of community participation in research, training and extension efforts.

The aim and scope of the journal are:

1. Sharing the relevant experiences and issues related to agriculture and allied fields at the grass root level and global forum to create the necessary academic and development climate.
2. Sensitizing the different stakeholders about the knowledge and innovation management system in pluralistic agri-rural environment.
3. Developing network among the related partners for convergence of their efforts for sustainable academic development of extension education discipline.

Editorial

Considering the changing nature of agriculture and the evolving challenges, farmers require a wide range of knowledge from different sources and support to integrate these different bits of knowledge in their production context. In this context, agricultural extension should play an increasingly important intermediation and facilitation role to support application of new knowledge including technical knowledge. National Agricultural Research System (NARS) has developed improved technologies but experts raised concern that the improved technologies are not reaching to the end users.

Agriculture is a state subject and agricultural extension becomes primary responsibility of the states. The human resource in agricultural extension in the states is depleting and ratio of extension personnel to farmer is increasingly being dismal. The gap is widening. The growing uncertainties in agriculture and changing market scenario added new dimension in the information need of the farmers and other stakeholders. Today's challenge for extension is how to communicate information to the stakeholders to meet the changing information need. The processes of learning and knowledge management have acquired new dimensions with the advent of fast developing trends in Information and Communication Technologies (ICTs). With increasing global competition in the agriculture sector, learning process has to be rapid, updated, highly dynamic and tailor-made to the global needs.

Society for Community Mobilization for Sustainable Development (MOBILIZATION) is always striving for stimulating multi sectoral stakeholders like researchers and extension professionals, innovative farmers and students through the *Journal of Community Mobilization and Sustainable Development*. Some of the papers contained in this issue specifically focus on linking farmers to the market, role of media mix in imparting education, participatory behaviour of farmers, impact of SHG on women empowerment, yield gap analysis, social-profile and entrepreneurial characteristics of successful and unsuccessful SHG micro-entrepreneurs, impact analysis, socio-economic impact of Mitraniketan, communication behaviour of farmers, knowledge level and adoption of improved technologies, development and assessment of need based and interactive ICT based self learning tool, development of a scale to measure quality orientation of agricultural scientists.

I extend my heartfelt thanks to the members of the editorial team specially- Drs. R. K. Dhaliwal, Shantanu Kumar Dubey, Nishi Sharma, R. Roy Burman, M. S. Nain and faculties of the Division of Agricultural Extension, IARI Drs. V. Sangeetha, V. Lenin and Sh. Sujit Sarkar who rigorously edited the papers to bring out the journal.

I express my gratitude to the contributors for their quality research papers for this issue. I extend my special thanks to Dr. Tulsi Bhardwaj in shaping this issue of the journal.

J.P. Sharma
Chief Editor

Impact Analysis of Credit Utilization through Co-operative Society

Prashant Sharma and O.P. Daipuria

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ABSTRACT

Credit utilization is the amount of purchasing power you have calculated as the total credit available divided by the total debt. The study evaluated agricultural credit utilization by cooperative Society in Bhind District. Data were collected from randomly sampled Agricultural Cooperative societies from 12 villages of selected area by using a structured questionnaire. The result of study showed that majority of the farmers (47.50%) is within the age bracket of active work (i.e. Complete Utilization) and therefore can make meaningful impact in agricultural production when motivated with the needed credit facilities. Majority of respondents benefiting from credit utilization through co-operative societies and there is significant relation between personal and socio economic traits i.e. education, social participation, occupation, size of land holding etc. and credit utilization but caste is not significant relationship between personal and socio economic traits and credit utilization.

Keywords: Evaluation, Agricultural credit, Utilization, Farmers, Cooperative society

INTRODUCTION

Cooperatives are defined as “an autonomous association of persons who unite voluntarily to meet their common economic and social needs and aspiration through a jointly owned and democratically controlled enterprise (ICA, 1995). Cooperatives are established by like-minded persons to pursue mutually beneficial economic interest. Cooperatives is a medium through which services like provision of farm input, farm implements, farm mechanization, agricultural loans, agricultural extension, members’ education, marketing of members’ farm produce and other economic activities and services are rendered to members. Regular and optimal performance of these roles will accelerate the transformation of agriculture and rural economic development. The focus of this study therefore, is to evaluate credit utilization by cooperative societies in Bhind Block of Bhind District. The specific objectives are to: (i.) To study the socio-economic traits of the farmers; (ii.) To determine the credit utilization pattern of the farmers; (iii.) To analyze the relationship between personal & socio economic traits of the farmers and their credit utilization pattern; (iv.) To suggest the strategies for effective credit utilization pattern.

MATERIALS AND METHOD

The present study was undertaken in Bhind district. The District is situated in Chambal region in the northwest of the state. The sampling frame for this study consists of the cooperative farmers that acquired loan/credit facilities for their food crop farms with the assistance of the farmer cooperative societies. From the list of these cooperative farmers, 120 farmers were selected through simple random sampling technique from 10 villages. The data were collected from primary sources as well as secondary sources. Primary data was collected through the use of a structured questionnaire, copies of which were administered on the 120 farmers selected for the study. Data were analyzed using frequency distribution, percentages, correlation coefficient and t-test analysis.

RESULT AND DISCUSSION

Table 1 revealed that most of the credit utilizers (40.83%) belonged to OBC category. Most of respondents (35.00%) were educated up to middle school level. Higher percentage of respondents (48.33%) was found to medium social participation and 42.50 per cent respondents engaged in agriculture. Most of respondents (35.00%) found in medium size of land

holding category and followed by 33.333 per cent respondents in small land holding category. Most of respondent (42.5%) were in medium annual income group followed by 30.83 per cent in high income group. Majority of respondents belongs to medium level of innovativeness and Cosmo-politeness 51.66 and 50.00 per cent, respectively. Medium of communication sources (53.33%) had medium level of knowledge about the scheme and 55.83% respondents had medium communication sources and majority of respondents (54.16%) had credit facilities available with some difficulties.

Table 1: Frequency distribution of respondents according to socio-economic attributes

Category	Number of respondents (n=120)	Percentage
Caste		
SC/ST	30	25.00
OBC	49	40.83
General	41	34.16
Total	120	100.00
Education		
Illiterate	18	15.00
Primary school	28	23.33
Middle school	42	35.00
High school	22	18.33
Above high school	10	8.33
Total	120	100.00
Social participation		
Low participation	44	36.66
Medium participation	58	48.33
High participation	18	15.00
Total	120	100.00
Occupation		
Agriculture	51	42.50
Agril.+Business	42	35.00
Agril.+Business+Other	29	22.65
Total	120	100.00
Size of land holding		
Marginal	19	15.83
Small	40	33.33
Medium	42	35.00
Large	19	15.83
Total	120	100.00
Annual income		
Low	32	26.66
Medium	51	42.50
High	37	30.83
Total	120	100.00
Innovativeness		
Low	41	34.16
Medium	62	51.66

High	17	14.16
Total	120	100.00
Cosmopoliteness		
Low	45	37.50
Medium	60	50.00
High	15	12.50
Total	120	100.00
Knowledge about credit scheme		
Low	33	27.50
Medium	64	53.33
High	23	19.16
Total	120	100.00
Communication sources		
Low	29	24.16
Medium	67	55.83
High	24	20.00
Total	120	100.00
Credit facilities		
Easily available	38	29.68
Available with some difficulties	65	54.16
Difficulties available	17	14.16
Total	120	100.00

Table 2 showed that credit utilizers may utilize their credits in three different ways, one is utilizers who were spend their complete utilization of credit into respective loan belonging to (51.66%), another is who were spend some amount of their credit into respective loan and some amount in another partial utilization. Partial utilization are different types such as repayment of loan (15.83%), social function (11.66%), medical (8.33%), death function (5.83%) and other (6.66%). The zero order correlation coefficient of attributes of credit utilizers with credit utilization pattern is furnished in Table 3. It can be observed from the table that correlation coefficients in respect of education (0.790), social participation (0.650), occupation (0.646), size of land holding (0.736), annual income (0.699), innovativeness (0.681), cosmopoliteness (0.645), knowledge about credit scheme (0.708), communication sources (0.643), and credit facilities (0.563) were found positively significant with credit utilization pattern whereas caste (0.185) was found non significant.

Table 4 showed loan should be easily available at installment suggested got first rank (65.83%) of the respondents were suggested. Loan should be available by the medium of co-operative society of second ranks (64.16%) of the respondents suggested. Loan should be available for suitable time of third rank (55.00%), fourth rank is to take a loan process should be easy (50.83%) and got the fifth rank is loan should be available at every level of (42.50%) in order of preference.

Table 2: Distribution of respondent according to their credit utilization pattern traits

Characteristics	Category	No. of respondents	Percentage
Credit utilization	Complete utilization	57	51.66
	Partial utilization		
	a. Repayment of loan	18	15.83
	b. Social function	12	11.66
	c. Medical	09	08.33
	d. Death function	07	05.83
	e. Other	08	06.66
	Low utilization (No utilization)	09	07.50
	Total	120	100.00

Table 3: Relationship between personal and socio economic traits and credit utilization pattern of crop loan beneficiaries

Particulars	Correlation coefficient	't' value
Personal and socio economic traits		
Caste (X1)	0.185NS	1.977
Education (X2)	0.790**	7.957
Social participation (X3)	0.650**	6.641
Occupation (X4)	0.646**	6.607
Size of land holding (X5)	0.736**	7.455
Annual income (X6)	0.699**	7.112
Innovativeness (X7)	0.681**	6.943
Cosmopolitaness (X8)	0.645**	6.595
Knowledge about credit scheme (X9)	0.708**	7.194
Communication sources (X10)	0.643**	6.578
Credit facilities (X11)	0.563**	6.413

*= Significant at 1 % level of probability; ** = Significant at 5 % level of probability; NS = non significant

Table 4: Strategies for making effective credit utilization pattern

Strategies	Frequency	Percentage	Rank
Loan should be easily available at installment	79	65.83	I
Loan should be available for suitable time	66	55.00	III
Take a loan process should be easy	61	50.83	VI
Loan should be available by the medium of co-operative society	77	64.16	II
Loan should be available at every level	51	42.50	V

CONCLUSION

Individuals tend to use different credit utilization pattern for obtaining the technology. For accepting any innovation by the farmers in varying socio-personal and farm situation, different types of credit utilization pattern are required. The majority of the credit utilization of crop loan beneficiaries was educated above high school. The majority of the respondents received properly way and complete utilization of credit utilization pattern through co-operative societies. It revealed that education was found highly significantly associated with credit utilization pattern, whereas caste was found non significant relationship with credit utilization pattern. The respondents more suggested Loan should be easily available at installment.

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Communication Behaviour of Farmers Club

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ABSTRACT

The communication behaviour of the farmers' club found to exhibit medium (47 per cent) level. The information seeking behaviour revealed that the most preferred source is the Assistant Agriculture Officer, Agriculture officer in personal cosmopolite, neighbours, friends in personal localite and television in impersonal localite channel. Discussion with fellow members, revealed that memorising was the most preferred channel for information processing and information storing respectively. The interpersonal contact and informal chat during social functions was exhibited with regard to the information dissemination behaviour. The multiple regression analysis revealed that material status, social participation, contact with extension agency indicated a positive and significant influence on communication behaviour. Constant follow up by the subject matter specialists of KVKs with the farmers, club will ensure more involvement and organisational commitment.

Keywords: Farmers club, Communication behaviour

INTRODUCTION

The farmers club are booming now and then. They are called in different names like farmers' discussion groups, farmers' interest groups etc. The NABARD is encouraging the formation of farmers' clubs through *Krishi Vigyan Kendra* by giving financial assistance of Rs.10,000 per year on a three-year basis. The main objective is to strengthen the group approach in farming and to make the information reach the majority of the farmers. In this juncture, a study was undertaken to know the communication behaviour of the farmers' club formed by KVK Coimbatore under Tamilnadu Agricultural University. In the KVK Coimbatore these farmers' clubs are called as farmers discussion groups. The main objective of this study is to analyse the information seeking behaviour, information processing behaviour, information storing behaviour and information dissemination behaviour of farmers' club members.

MATERIALS AND METHODS

The study was undertaken in Coimbatore district of Tamil Nadu. In total, 100 farmers' club members were selected by random sampling from four men farmers' club and one woman farmers' club. Communication

behaviour in this study is the combined activity of information seeking, processing, storing and dissemination functions by the farmers club members. The information seeking behaviour was operationalised as the sources or channels from which the respondents get information. The scores for frequency of use of the sources/channels for seeking information ranged from 4 to 1 for 'always', 'sometimes', 'rarely' and 'never' in the order of sequence. The scores obtained for frequency of use of the source/channels by the individual in seeking information from each source/channel reported under personal cosmopolite, personal localite and impersonal cosmopolite were summed up to get the total score for information seeking behaviour of each individual.

The information processing behaviour was operationalised as the reaction of the respondents when they receive new information on farm practices and ways of processing them for use. This was measured on the general reaction of the respondents when they receive new information. Each item was given one score and the sum of the scores were worked out. The same procedure was followed for information storing and dissemination behaviour. For each item in the information seeking, processing, storing and dissemination behaviour, mean score was calculated and

the items were ranked based on the mean score. The correlation analysis and multiple regression analysis were performed.

RESULTS AND DISCUSSION

The information source utilisation behaviour of the respondents was ranked under personal cosmopolite, personal localite and impersonal cosmopolite channels. The results obtained are depicted in Table 1. The Assistant Agriculture Officer and Agriculture Officer with the mean score of 0.37 and 0.35 respectively were the most frequently utilised information sources. These officers make periodic visits to their area of operation and this might be the reason for their most used source for information seeking of the respondents. The financial constraints, lack of awareness about trainings, demonstrations conducted by KVK, state departments and poor coordination among the respondents were the main the reason for not utilising such sources of information. With regard to personal cosmopolite sources, the neighbours, local leaders and friends were the most utilised information sources. This finding is confirm after with the findings of Sharma *et al.* (2008). It is a fact that people in general have frequent touch with their neighbours, friends, local leaders and this might be the reason for frequently utilising them.

The television was the frequently used medium in impersonal cosmopolite channels and high educational status has influenced the respondents to read magazines/other publications. This is because that about 97 per cent of the respondents in the study were literates. Thus, the findings indicate that personal localite sources were the most frequently utilised followed by impersonal cosmopolite and personal cosmopolite sources.

Information received from different sources may not be in a readily understandable form. The individual farmer has to do some sort of processing/decoding activity (Table 2). What the farmer actually does after receiving the information is the question? The findings from table 2 portrays their processing behaviour pattern. Since the farmers club members are in groups, they share and discuss the information with many members frequently and this might be the reason for this item occupying the first position with the mean score of 0.81. Besides discussing with fellow members, the respondents consider the time, cost and technical feasibility when they receive any information. Lack of adequate extension personnel decreased the frequency

Table 1: Pattern of information source utilisation behaviour of the respondents

Sources/Channels	Mean score*	Rank
Personal cosmopolite		
KVK scientists	0.28	VIII
Village extension worker	0.30	VII
Agricultural Officer	0.35	II
Assistant Agricultural Officer	0.37	I
Assistant Director of Agriculture	0.25	X
Deputy Director of Agriculture	0.32	V
Joint Director of Agriculture	0.25	X
Farmer demonstrator	0.25	X
Tour/field trip	0.34	III
Field day/demonstrations	0.31	VI
Agricultural exhibitions	0.33	IV
Training	0.27	IX
Personal localite		
Contact farmers of own village	0.76	IV
Contact farmers of other village	0.75	V
Friends	0.83	II
Neighbours	0.85	I
Relatives	0.79	III
Input dealers	0.71	VII
Local dealers	0.83	II
Other non contact farmers	0.72	VI
Radio	0.47	III
Farm school on air	0.25	VIII
Poster/chart	0.41	V
Film show/Slide show	0.30	VII
Television	0.56	I
News paper	0.43	IV
Magazine/other publications	0.52	II
Leaflet	0.40	VI
Wall painting/banner	0.25	VIII
Display board	0.40	VI

(* multiple responses were obtained)

of information exchange with the respondents and this might be the reason for its last position.

The information storing is the way to recall the information whenever needed. It is essential to store the information received and processed by the individual for his/her future use. Majority of the respondents (mean score of 0.68) stored the information by memorising and infact the old age people related the new information with already known things with their experience. Hence it got the second rank with mean score of 0.49 (Table 3). The information seeking behaviour through leaflets, folders and journals was low with the mean score of 0.21 by the members of farmers club and information storing behaviour through these methods secured least rank.

Table 2: Information processing behaviour pattern of the respondents

Specific items	Mean score*	Rank
Accept it unreserved	0.02	VIII
Weigh it in the light of past experience	0.47	III
Discussion with fellow members	0.81	I
Cross check it against past recommendations	0.29	IV
Judge in the light of socio economic conditions	0.55	II
Consider its technical feasibility	0.18	V
Discussion with specialists	0.11	VI
Discussion with extension workers	0.07	VII

(*multiple responses were obtained)

The information dissemination behaviour is the most important activity expected from the respondents. It could be inferred that the interpersonal contact (mean score of 0.88) and informal chat (mean score of 0.56) during social functions were the frequently used methods of information dissemination (Table 4). During interpersonal contact and social functions, the members exchange the information about the farm technologies and innovations known to them. Field day lectures and farmers training meetings were hardly conducted and so the information dissemination behaviour through field day lectures was nil and low in case of farmers training meetings. Moreover, the respondents has the tendency to believe that farmers were already aware of the practices and so they were not disseminating through other methods like letters and telephone calls. This might be the reason for disseminating the information mainly through interpersonal contact and informal chat during social functions with least preference to other items.

The correlation analysis (Table 5) revealed that the variables viz., farm status, material status, contact with extension agency and mass media exposure had shown positive and significant association with communication behaviour at one per cent level of probability. Economic motivation was found to have a negatively significant relationship with communication behaviour at five per cent level of probability.

Multiple regression analysis (Table 5) revealed that when all the 15 variables put together at, *ceteris paribus*, contributed to 60.10 per cent of variation in communication behaviour. 'F' value was significant at

Table 3: Information storing behaviour pattern of the respondents

Specific items	Mean score*	Rank
By memorizing	0.68	I
By making note in the note books	0.31	III
Consciously relate the new information with already known things, so as to make the recall easy	0.49	II
Informing to other farming members for keeping it in mind	0.22	IV
Preserving leaflets, folders, handouts, journals in a specified place and file	0.21	V
Preserving AIR farm school publications	-	-

(*multiple responses were obtained)

Table 4: Information dissemination behaviour pattern of the respondents

Specific items	Mean score*	Rank
Inter personal contact	0.88	I
Telephone calls	0.01	VI
Through letters	-	-
Field day lectures	-	-
Demonstrations	0.26	IV
Group meetings	0.30	III
Informal chat during social functions	0.56	II
Farmers training meetings	0.01	VI
Reading/supplying of farm magazines	0.05	V

(*multiple responses were obtained)

1 per cent level. It could be inferred that at, *ceteris paribus*, a unit increase in material status, social participation and contact with extension agency would result in increase of 0.217, 3.951 and 0.725 units respectively on communication behaviour of the respondents. Hence, material status, social participation and contact with extension agency will enhance the communication behaviour of the respondents. This study found that forty seven per cent of the respondents had medium level of communication behaviour. The analysis further revealed that majority of the respondents had medium to low level of material status and social participation and high level of contact with extension agency.

CONCLUSION

The communication behaviour was medium among the farmers' club. Hence, constant follow up with the farmers club by the subject matter specialists KVKs will ensure more involvement and organisational

Table 5: Correlation and Multiple regression coefficient of independent variables with the communication behaviour.

Var.No	Variables	Correlation coefficient 'r'	Multiple regression coefficient	Standard error of regression	Computed 't' value
X ₁	Age	0.050	-0.163	0.091	-1.794NS
X ₂	Experience in FDG	0.093	-0.168	0.750	-0.223NS
X ₃	Educational status	0.126	0.243	0.180	1.348NS
X ₄	Farm status	0.281**	1.104	0.851	1.296NS
X ₅	Material status	0.440**	0.217	0.093	2.325*
X ₆	Social participation	0.155	3.951	1.792	2.205*
X ₇	Annual income	0.167	-0.000017	0.000	-0.730NS
X ₈	Contact with extension agency	0.584**	0.725	0.104	6.992**
X ₉	Cosmopolitaness	0.167	-0.494	0.983	-0.502NS
X ₁₀	Mass media exposure	0.421**	0.562	0.456	1.233NS
X ₁₁	Training attended	0.088	-0.597	0.900	-0.664NS
X ₁₂	Economic motivation	-0.197*	-0.219	0.220	-0.994NS
X ₁₃	Credit orientation	0.086	-1.471	0.754	-1.951NS
X ₁₄	Risk orientation	0.124	0.367	0.282	1.298NS
X ₁₅	Innovativeness	0.071	0.177	1.090	0.162NS

R² = 0.601; NS= Non significant; F= 7.272; ***Significant at 5 per cent level; **Significant at 1 per cent level

commitment. The awards, rewards and incentive programmes may be increased for involvement of the best performing group. The best performing group should be assessed by each year by the KVK and they have to take a free exposure visit to other parts of the country. This will in turn motivate the farmers clubs to do better and will motivate other farmers clubs to grab the incentive. Further extension agency contact was high with the respondents. Hence, extension agents may arrange for frequent meetings, demonstrations to strengthen the communication behaviour of the respondents. The respondents are to be motivated to read agricultural magazines like *valarum velanmai*, *seithimadal* published by Tamil Nadu Agricultural University (TNAU). The publicity regarding the trainings, demonstrations conducted at KVK and state departments should be done properly. This could be

made by maintaining contact numbers of the farmers clubs at KVK level. Those farmers clubs members who are having good material status, social participation and contact with extension agency should be selected for dissemination of any technology by the KVK and state departments.

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Economics of Goat Farming Under Traditional low Input Production System in Uttar Pradesh

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ABSTRACT

A study on goats in 150 villages in 40 districts of Uttar Pradesh on different flock sizes and breeds was undertaken to evaluate the economic performance of goats under traditional farming system. Study revealed that small flock size (<15) was most profitable followed by flock sizes 16-30, 31-45 and >45. The net return worked out to be Rs. 1348, 1148, 974 and 865 per goat/annum, respectively. The net profit (per goat/annum) decreased linearly with the increase of flock sizes due to inadequate nutrition and management by larger goat keepers. Sale of goats was the major source of income (69.90%) followed by milk (31.90%) and manures (8.20%). Among breeds, Barbary gave highest return, due to its higher prolificacy followed by Jamunapari, Jaunpuri and non-descript. The net return per goat/annum worked out to be Rs. 1207, 1022, 966 and 916, respectively. The flock of Barbary and Jamunapari gave 31.9 and 11.9% higher net return per goat/annum over non-descript, respectively. In present study, the shrinking of grazing resources and large population of non-descript goats (79.20%) were the major constraints in making the goat farming more remunerative. Therefore, rearing of goat can not sustain only on grazing resources, needs to switch over to semi-intensive/intensive system of management. Similarly, the local breed needs to be improved by massive cross breeding programme to take the advantage of heterosis.

Keywords: Goat farming, Economics of goat farming, Goat breeds in Uttar Pradesh

INTRODUCTION

Goats contribute significantly to the Indian economy by sustaining livelihood and supplementing income of small farmers and rural poor. The share of goats to the total milk yield and meat production of India was recorded as 3.82% and 69.35%, respectively. The value of the output from goat milk and meat was estimated as Rs. 44.3 billion and Rs. 71.66 billion, respectively during 2004-05 (GOI, 2006). The demand for goat meat is progressively increasing as Indians prefer goat meat (*Chevon*) among all other meats (Sen *et al.*, 2004). India possesses 16.60% (124.50 million) of the world's goat population and rank first in world (Singh, 2004). Uttar Pradesh has 12.94 million goats and ranked III after West Bengal and Rajasthan. The important native breeds of Uttar Pradesh are Barbary (15.50%), Jamunapari (3.33%) and Jaunpuri (1.89%) as per 17th livestock census. Being the 3rd largest goat populated state, goat farming offers immense opportunities and potential for generating income and employment to land less, resource poor in

state. Keeping this in view, a study was conducted on 'Economics of goat farming under traditional low input production system in Uttar Pradesh'.

MATERIALS AND METHODS

The study was conducted in 40 districts of Uttar Pradesh covering each 9 agro-climatic zones during 2009-10. The data were collected on dynamics of goat production from primary as well as secondary sources using questionnaire. Door to door survey of 217 households was carried out to find out the flock sizes, breeds, goat farming system, etc. in 150 adopted villages by *Krishi Vigyan Kendras*. Participatory Rural Appraisal (PRA) and farmers group discussions recorded for assessing the situation related to goat farming. The information on feeding, breeding, health care and shelter management practices along with the productivity, profitability, etc., were recorded.

The selected goat keepers were classified in two ways, according to (i) flock sizes and (ii) breeds or its types. The details of land holdings, flock ranges, average flock

Table 1: Classification of goat keepers based on flock sizes and breeds

Categories	Categorization based on flock sizes			
	Small (I)	Medium (II)	Semi-medium (III)	Large (IV)
No. of goat keepers	100	50	36	31
Land holding	Small	Small/marginal	Marginal/ landless	Landless
Flock ranges	5- 15	16-30	31-45	45-110
Average flock size	9.30	20.60	36.80	77.80
Goat farming system	Intensive	Semi-intensive	Extensive	Free range
Categorization based on breeds or it types				
Breeds	Barbary	Jamunapari	Jaunpuri	Non-descript
Number of goat keepers	68	40	09	100
Flock ranges	5-35	25-40	20-32	5-110
Average flock size	21.00	32.20	25.20	28.10

sizes, system of goat farming in different categories as well as breeds are given in Table 1.

RESULTS AND DISCUSSION

Small owners mostly followed stall feeding with little bit grazing. While large goat keepers raised their goats solely on browsing and grazing stubbles of field crops, natural pasture, etc. Old men, women or children of family took care, time to time of their flocks. Hence, family labour was included in feeding expenditure.

1. Economics of different flock sizes of goat farming

(a) Category wise flock status: The initial average flock size of goats, in the categories I, II, III and IV were 9.30, 20.60, 36.80 and 77.80 numbers, respectively. After one year, 72.20, 66.60, 62.20 and 53.40% goats were sold and the strength of flock consisted almost identical during the end of year in respective categories. Proportionally, the highest sell percentage of goats was in category I followed by II, III and IV with an over all average of 16.50 (62.30%).

(b) Category wise Investment: The average annual expenditure of Rs. 19,142, Rs. 34,908, Rs. 59,452 and Rs. 1,32,982 was incurred for categories I, II, III and IV, respectively. The major investment was found on the value of initial stock, which alone accounted for 78.80% of the total expenditure. The maintenance cost per goat was worked out to be highest in category I (Rs. 566) followed by II (Rs. 402), III (Rs. 327) and lowest in IV (Rs. 232) with an overall average of Rs. 280 per year without considering the family labours. Comparatively, higher investment of Rs. 810 and Rs. 524.70 per goat/annum was reported by Singh *et al.* (1995) and Singh *et al.* (2009) for Mathura district and north Gujarat, respectively with inclusion of family

labour which alone shared from 65 to 80%. However, without considering the family labour, a similar finding (Rs. 408 per goat/annum) was reported by Maity and Das (2000) for Bundelkhand region. Among maintenance, highest expenditure was on feeding (67.20%) followed by shelter (22.80%) and veterinary medicines (10.00%). It is evident from the Table 3 that as the flock size increased the recurring expenditure decreased, because the large goat keepers were mostly below the poverty line and unable to feed concentrate except grazing.

(c) Category wise return: The gross and net profit worked out to be Rs. 31,675 and Rs. 12,553 for category I, Rs. 58,565 and Rs. 23,657 for category II, Rs. 95,292 and Rs. 35,480 for category III and Rs. 20,03,12 and Rs. 67,330 for category IV, respectively. Other than existing stock value, major source of income was from the sale of goats (59.90%) followed by milk (31.90%) and manure (8.20%). Almost similar findings were reported by Gupta *et al.* (1992) and Singh *et al.* (2009). The value of existing stock over a year has enhanced to 9.32% as compared to the initial stock value, after the selling of 62.30% individuals. The annual net profit per goat was highest in category I (Rs. 1,348) followed by II (Rs. 1,148), III (Rs. 974) and IV (Rs. 865) with an overall average of Rs. 1,084. Kumar *et al.* (2003, 2006) reported similar income (Rs. 884 to 1,302 per goat/year) to present finding. The net return per goat/annum was 24.60 and 6.90% higher in category I and II while 9.90 and 15.70% lower in III and IV than the overall average. The annual gross and net return per household appreciably increased with the increase of flock sizes but net return per goat decreased inversely. It happened because adequate feeding and health care were not provided by large owners. They kept the goats, solely on grazing resources, which are

also shrinking vigorously. On the other hand, small owner fed concentrate, kitchen waste, cultivated fodder and took better care of their flock and achieved higher net return.

2. Economics of different breed of goat farming

(a) Breed wise flock status: The breed wise, initial flock size of Barbary, Jamunapari, Jaunpuri and non-descript were 21.00, 32.30, 25.20 and 27.10 individuals, respectively (Table 4). After one year, the respective breeds were maintained constantly at 22.50, 32.00, 25.50, and 28.40 individuals with an over all average of 26.8. The sale percentage was highest in Barbary (73.30) followed by Jaunpuri (65.10), non-descript (62.70) and lowest in Jamunapari (48.00). It was due to genetic traits of prolificacy (litter size, kidding interval, etc.) of individual breeds.

(b) Breed wise Investment: The average annual investment per household of goat breed like Barbary,

Jamunapari, Jaunpuri and non-descript were Rs. 36,066, Rs. 57,178, Rs. 44,187 and Rs. 47,171 respectively with an overall average of Rs. 46,752. The capital investment was 81.02% on initial stock. This was supported by Singh *et al.* (1995). The annual maintenance cost per goat worked out to be highest in Barbary (Rs. 401) followed by Jamunapari (Rs. 340), Jaunpuri (Rs. 307) and lowest in non-descript (Rs. 293) with an overall average of Rs. 335. The average expenditure on feeding per goat was only Rs. 231, Rs. 206, Rs. 210 and Rs. 201 for respective breeds. The annual expenditure on veterinary aids per goat was highest in Jamunapari (Rs. 47) followed by Barbary (Rs. 38), Jaunpuri (Rs. 34) and the lowest in non-descript (Rs. 30).

(c) Breed wise return: The gross return per household from different breeds was Rs. 61,408, Rs. 90,095, Rs. 68,538 and Rs. 72,005 in case of Barbary, Jamunapari, Jaunpuri and non-descript, respectively with overall average of Rs. 73,317. The net return per unit over

Table 2: Category wise flock status

Category	Initial flock size	Sold in individuals	Sale (%)	Current flock size
I	9.28	6.70	72.20	10.20
II	20.57	13.70	66.60	20.80
II	36.80	22.80	62.00	37.50
IV	77.80	41.50	53.40	78.00
Average	26.50	16.50	62.30	27.20

Table 3: Category wise economics (Rs.) of different flock sizes

Category / Annual expenditure	Small(I)	Medium(II)	Semi-medium(III)	Large(IV)	Average
Average flock sizes (No.)	9.30	20.60	36.80	77.80	36.20
Value of initial stock	13,869	26,614	47,412	1,14,906	37,879
i) Investment on feeding	3,450	5,280	6,120	12,280	6,783
ii) Depreciation on shed	1,333	2,247	3,685	4,023	2,310
iii) Medicines	490	767	2,235	1,773	1,005
Total variable cost (i to iii)	5,273	8,294	12,040	18,076	10,098
Gross expenditure	19,142	34,908	59,452	1,32,982	47,977
Annual Income					
Value of existing stock	16,825	28,745	48,522	1,24,206	41,412
i) Sell of goats*	8,910	17,880	28,060	45,620	25,118
ii) Sale of milk	4,760	9,542	14,960	24,331	13,398
iii) Sale of manure	1,180	2,398	3,750	6,084	3,353
Annual return (i to iii)	14,850	29,820	46,770	76,035	41,869
Gross income	31,675	58,565	95,292	20,0,241	83,281
Net income	12,553	23,657	35,840	67,330	35,305
Net profit/goat	1,348	1,148	974	865	1,014

*(Sale of goats includes all e.g. kid, buck, doe and spent)

variable cost worked out to be Rs. 25,342 from Barbary, Rs. 32,917 from Jamunapari, Rs. 24,351 from Jaunpuri and Rs. 24,834 from non-descript with an overall average of Rs. 26,565. The highest income was from sell of goats (54.80%), followed by milk (35.90%) and manure (9.30%). There was no considerable variation, among the sale percentage of different commodities in breeds except proportionally, higher sale value of milk in Jamunapari. The net return per goat/annum was highest in Barbary (Rs. 1203) followed by Jamunapari (Rs. 1,022), Jaunpuri (Rs. 966) and non-descript (Rs. 916) with an overall average of Rs. 1013. The B: C ratio was highest in Barbary (1.72) followed by jamunapari, jaunpuri and local goats respectively. Comparatively, higher B: C ratio in Barabary (2.00) was reported by Singh *et al.* (2009). The Barbary and Jamunapari or its type gave 31.9 and 11.60% higher net return due to their higher litter size and milk production respectively, over local breed.

CONCLUSION

The economics of goat rearing on prevailing traditional system worked out covering 217 goat flocks of different sizes and breeds in 40 districts of Uttar Pradesh. The net profit per goat/annum was highest in flock size 9.30 (Rs. 1348) followed by 20.60 (Rs. 1148), 38.80 (Rs. 974) and lowest in 77.80 (Rs. 865). Among breeds, maximum net receipt of Rs. 1,207 per goat/annum was obtained from Barbary followed by Rs. 1,022 in Jamunapari, Rs. 966 in Jaunpuri and lowest Rs. 916 in *desi* goats. Larger flock could not fully express to their genetic traits due to poor nutrition i.e. declining of grazing resources. Lack of quality breeding bucks was another constraint to improve the large populous poor productive *desi* goats. The rearing of goats under free range grazing/ extensive management may not sustain more due to shrinking grazing land; need to switch over to intensive system.

Table 4: Breed wise flock status

Breed Wise	Initial flock size	Sold individuals	Sale (%)	Current flock size
Barbary	21.00	15.40	73.30	22.50
Jamunapari	32.30	16.50	48.00	32.00
Jaunpuri	25.20	16.40	65.10	25.50
Non-Descript	27.10	17.00	62.70	28.40
Average	26.50	16.50	62.30	26.80

Table 5: Economics of different goat breed (Rs.)

Breeds/Annual Expenditure	Barbary	Jamunapari	Jaunpuri	Non-descript	Average
Average Flock Sizes	21.00	32.20	25.20	27.10	26.50
Value of initial stock	27,639	46,220	35,850	39,204	37,879
i) Cost on f feeding	4,860	6,638	5,295	5,440	5,558
ii) Depreciation on shed	2,769	2,807	2,185	1,714	2,310
iii) Veterinary aids	798	1,513	857	813	1,005
Total (i to iii)	8,427	10,958	8,337	7,967	8,873
Gross expenditure	36,066	57,178	44,187	47,171	46,752
Annual Income					
Cost of existing stock	33,711	48,852	38,000	41,605	41,412
i) Sell of goats	15,280	20,093	17,038	17,520	17,483
ii) Sale of milk	9,624	17,270	10,800	10,398	11,477
iii) Sale of manure	2,793	3,880	2,700	2,482	2,945
Total (i to iii)	27,697	41,243	30,538	30,400	31,905
Gross Income	61,408	90,095	68,538	72,005	73,317
Net Income	25,342	32,917	24,351	24,834	26,565
Net profit/ goat	1,207	1,022	966	916	1,012
B :C Ratio	1.72	1.57	1.55	1.52	1.57

*(Sale of goats includes all e.g. kid, buck, doe and spent)

Thus, the success in overcoming on these two obstacles, goat farming offers immense opportunity for income and employment generation of land less, poor and weaker section of society.

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INDIRA AWAS YOJANA- Hope of Roof over Rural Poor Head: A Critical Analysis

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ABSTRACT

From time immemorial, housing and shelter have been a basic and fundamental prerequisite for human existence. A house of one's own is still a distant dream for millions of rural folk in the country. Housing availability is an indicator of the quality of life that citizens enjoy and also essential for healthy and civilized existence. India has registered significant progress in housing arrangement for the rural people over the last few decades. In spite of the progress made, rural housing problems continue to be daunting in terms of growing population, rampant speculation coupled with spiralling prices of land and houses. It is challenge to government to secure affordable and adequate shelter to the homeless. Various programmes have been launched by the government to fulfil the housing requirement to the rural poor. It has been experienced that due to lack of awareness about these programmes, rural people have not been able to take full benefit out of these programmes. So keeping in view the above point in consideration the present study entitled "Indira Awas Yojana- hope of roof over rural poor : A critical assessment" was planned with special focus on peoples' awareness, participation, satisfaction and constraints faced by them in harnessing the benefits from the programmes. The study was conducted in Kashi Vidyapeeth block of Varanasi district of Uttar Pradesh. The findings of the study reveals that a total of 75 per cent of the respondents had medium level of awareness regarding developmental aspects of IAY followed by low level of awareness (16.67%) and high level of awareness (8.33%). The average levels of awareness the after interventions were 10.01 whereas before interventions it was only 6.88. A cumulative of 61.66 per cent of the respondents showed their satisfaction about IAY programme. Out of these, 24.16 per cent were highly satisfied and 37.50 per cent were satisfied.

Keywords: Indira Awas Yojana (IAY), Awareness, Participation, Satisfaction, Rural people (respondents), Housing and development

INTRODUCTION

Development means increase in the capacities of the society to organize for its own objectives and to carry out its programmes more effectively (Belshaw, 1977). Vidyarathi (1981) described development as "growth" + "change". It involves materials and human factors. He clarifies that the economic approach of development is not acceptable because socio-cultural factors also an integral part of the dynamics of growth and that social change is not a simply non-functional effect of planning. Hence, development process has to be ultimately assessed for impact on quality of life and human well being. It is well known that shelters being a basic human need rank next to food and clothing. A certain minimum standard of living is essential for man's health and this closely linked with the improvement of the overall quality

of life and for leisure, privacy and dignified living. The planned development of housing has therefore, being given high priority in the poor Indian society where housing amenities are far below the accepted minimum standard (Gaur, 1996). Ravindranath Tagore rightly says about housing need as "*Long did not I cherish a desire, not for wealth, nor fame, but a tiny house, tucked away in the corner of the earth, where I could be alone with my thought*". Tagore expressed his desire for a tiny house reflecting, perhaps, the dream of millions of rural folk of the country (Joshi, 1996). Poverty is a curse in the society and it leads to social deprivation of the poor and homelessness expressed social segregation. Hence, removal of poverty and homelessness has to be tackled simultaneously. In fact, planning for housing for the poor is the part and parcel of planning for economic and social development. Planning Commission point out that "*housing is an activity*

that is typically labour intensive created much needed employment in the unskilled and therefore, fit in well with the pattern of development envisaged in the plan" (Mishra, 1996). The changing life style, profile of people, size of households, demographic pressure and economic complexities of the prevailing habitat determine the static and dynamic needs and demand for housing. The need for focusing immediately on housing in the rural areas has been felt to achieve better results of rural development in the true sense. Prior to 1960s, development economist gave a fairly low priority to the housing sector and considered to be unproductive sector. In the 1960s, however, the philosophy changed and priority was being assigned to housing sector (Wishwakarma, 1996). Retrospection in to the historical evolution of rural housing goes back to the Village Housing Scheme formulated in 1957 and to National Commission on Labour, 1969 which recommended that the '*landless labour should provided the land tenurial rights to sites of their huts*'. Despite the appalling housing situation for decades affecting millions of people, it was mainly made progress in real sense in March 12, 1988 when a draft of the housing policy was placed in the parliament laying down the goal of eradicating homelessness by AD 2001. National Housing Policy was presented in parliament in July 1992 and approved in 1994 by stressing for creating an enabling environment for accomplishing the goal of '*shelter of all*' on self sustain basis. A number of schemes are under implementation for the rural area in the housing sector. The genesis of the Indira Awaas Yojana (IAY) can be traced to the programmes of rural employment, which began in the early 1980s. Construction of houses was one of the major activities under the National Rural Employment Programme (NREP), which began in 1980, and the Rural Landless Employment Guarantee Programme (RLEGP), which began in 1983. There was, however, no uniform policy for rural housing in the States. For instance, some States permitted only part of the construction cost to be borne from NREP/ RLEGP funds and the balance was to be met by beneficiaries from their savings or loans obtained by them. As per announcement made by the Government of India in June 1985, a part of the RLEGP fund was earmarked for the construction of houses for SCs/STs and freed bonded labourers. As a result, Indira Awaas Yojana (IAY) was launched during 1985-86 as a sub-scheme of RLEGP. It is a flagship scheme of the Ministry of Rural Development to provide houses to the poor in the rural areas. IAY, thereafter, continued as a sub-scheme of Jawahar Rozgar Yojana (JRY) since its launching in April,

1989. IAY was de-linked from JRY and made an independent scheme with effect from 1st January 1996. The objective of the Indira Awaas Yojana is primarily to help in construction/upgradation of dwelling units of *rural BPL householders belonging to* members of Scheduled Castes/Scheduled Tribes, freed bonded labourers, minorities and other non-SC/ST by providing them a lump sum financial assistance (www.iay.nic.in). It has been experienced that due to lack of awareness about the programmes, rural people have not been able to take full benefits. So keeping in view the above point in consideration the present study entitled "*INDIRA AWAS YOJANA- hope of roof over rural poor head: A critical analysis*" was planned with special attention on programme effectiveness in terms of peoples' awareness, participation, satisfaction and constraints faced by them in harnessing the benefits from the programmes.

MATERIALS AND METHODS

The study was conducted in purposively selected Community Development (CD) block, Kashi Vidyapeeth in the Varanasi district of Uttar Pradesh, India. There are 8 blocks in Varanasi district. Kashi Vidyapeeth block was selected purposively for the study because the NRHM are successfully implemented in this block for benefiting the rural population. There are 130 Villages in the Kashi Vidyapeeth Block of Varanasi district. Eight Villages namely *Gajadharpur, Madhopur, Tikari, Bhitari, Chitauni, Maheshpur, Bishunpur and Harpalpur* were randomly selected. Through proportionate random sampling techniques, 15 per cent of beneficiaries were selected from each village. Thus a total of 120 respondents were selected for the purpose of the study. To see the effectiveness of interventions, an interface between Block officials and villagers were organized in the selected villages. Printed literatures related to the IAY was prepared and distributed among the villagers. Effect of interventions was measured in terms of awareness by applying before after experimental design. The required information was collected through structured interview schedule. Collected data was tabulated and analyzed by using statistical techniques like frequency, percentage, mean, standard deviation and correlation. Some important statistical details related to housing and demography of the sample area has been presented in Table 1, 2 and 3. It is clearly reflected from indicated Table that how much the goal for providing the house to the poor people has been achieved. Uttar Pradesh state is most populous state of the country and Varanasi district

Table 1: General Information about Varanasi district and Kashi Vidyapeeth block

S.No.	Indicator		Uttar Pradesh	Varanasi	Kashi Vidyapeeth block
1	Geographical Area(2001)	:	2,40,928 sq.km	1535 sq.km.	184.81 sq.km.
2	Population (2011)	:	19,95,81,477	3,682,194	3,372,21*
	(I) Male (2011)	:	10,45,96, 415	1,928,641	176603*
	(II) Female (2011)	:	94, 985,062	1,753,553	154140*
	(III) Rural (2011)	:	15,51,11,022	1878100*	NA
	(IV) Urban (2011)	:	4,44,70,455	1260570*	NA
	(V) Scheduled Caste	:	35,148,377	435540	46871*
	(VI) Scheduled Tribes	:	107,963	770	NA
	(7) Sex Ratio	:	908	909	893*
	(8) Population Density	:	828 sq.km.	2399 sq.km.	NA
3	Literacy (2011)	:	69.72%	77.05 %	50.76%*
	(1) Male (2011)	:	79.24%	85.12 %	64.00%*
	(2) Female (2011)	:	59.26%	68.20 %	34.80%*

Source: Population Census of India 2011, Office of Registrar General, India. www.varanasi.nic.in, Population register of Kashi Vidyapeeth block 2001 * 2001 data

Table 2 Outlook of Indira Awas Yojana in Uttar Pradesh and Varanasi

Particulars	Uttar Pradesh			Varanasi		
	2010-11	2011-12	2012-13*	2010-11	2011-12	2012-13*
Registered in MIS						
IAY New Construction	284398	301727	109543	2738	2775	2114
Up gradation	100	794	06	00	01	00
Special Package	162	305	26	000	00	00
Contingency Fund	299	185	06	00	00	00
Credit cum subsidy	34	209	01	00	00	00
Homestead Scheme	561	1695	44	00	01	01
Total	285554	304915	109626	2738	2777	2115
House Sanctioned						
IAY New Construction	89421	285126	72042	513	1814	1905
Up-gradation	3	682	00	00	00	00
Special Package	06	68	00	00	00	00
Contingency Fund	00	85	00	00	00	00
Credit cum subsidy	00	208	00	00	00	00
Homestead Scheme	07	803	00	00	00	00
Total	89434	286972	72042	513	1814	1905

Source: www.iay.nic.in, Ministry of Rural Development, Govt. of India *Data reported up to March 2012

having second place in case of population density next to Ghaziabad district. So much effort required to fulfill the basic need of the people in general and rural poor in particular.

RESULTS AND DISCUSSION

The concept of awareness has become of increasing importance to both social and technical research (Christian Heath *et al.*, 2002). Awareness is related to more general state of consciousness. The practice of awareness becomes a part of state of consciousness in

relation both to one self and to the whole of life. Awareness is characterized as “an understanding of the activities of others, which provides a context for one’s own activities” (Dourish and Bellotti, 1992). It refers to the state of being aware about Indira Awas Yojana. At awareness stage the beneficiaries learn about the developmental programme but lack detailed information about it. Data related to awareness about IAY were collected at the beginning of data collection. After one week an interface between Block officials and villagers were organized in the selected villages. Printed

Table 3: Social category wise Number of Indira Awas Yojana (IAY) house sanctioned

Components of IAY	Category	Uttar Pradesh			Varanasi		
		2010-11	2011-12	2012-13*	2010-11	2011-12	2012-13*
Registered in Management Information System (MIS)							
	ST	4910	3824	1025	11	14	19
	SC	137263	156169	54095	1743	1664	1243
	Minority	52137	42244	11065	74	123	45
	Others	143381	144922	54506	984	1099	853
	Total	285554	304915	109626	2738	2777	2115
IAY New House Construction Sanctioned							
	ST	1248	3064	723	02	13	18
	SC	42232	147020	36200	329	1069	1113
	Minority	7875	37834	7575	18	88	40
	Others	45938	135042	35119	182	732	774
	Total	89418	285126	72042	513	1814	1905
Upgradation house sanctioned							
	ST	00	02	00	00	00	00
	SC	03	540	00	00	00	00
	Minority	00	232	00	00	00	00
	Others	00	140	00	00	00	00
	Total	03	682	00	00	00	00
Special Package House sanctioned							
	ST	00	00	00	00	00	00
	SC	00	39	00	00	00	00
	Minority	05	12	00	00	00	00
	Others	01	29	00	00	00	00
	Total	06	68	00	00	00	00
Contingency fund house sanctioned							
	ST	00	00	00	00	00	00
	SC	00	27	00	00	00	00
	Minority	00	07	00	00	00	00
	Others	00	58	00	00	00	00
	Total	00	92	00	00	00	00
Credit cum subsidy house sanctioned							
	ST	00	00	00	00	00	00
	SC	00	133	00	00	00	00
	Minority	00	42	00	00	00	00
	Others	00	75	00	00	00	00
	Total	00	208	00	00	00	00
Homestead scheme							
	ST	00	03	00	00	00	00
	SC	06	407	00	00	00	00
	Minority	00	24	00	00	00	00
	Others	01	393	00	00	00	00
	Total	07	803	00	00	00	00

Source: *www.iay.nic.in*, Ministry of Rural Development, Govt. of India *Data reported up to March 2012

literatures related to IAY were prepared and distributed to the villagers. Effects of interventions were measured in terms of awareness by using before and after experimental design. It is clearly reflected from Table 4 that before interventions, a total of 75 per cent of the respondents had medium level of awareness

regarding developmental aspects of IAY followed by low level of awareness (16.67%) and high level of awareness (8.33%) and after interventions, 82.50 per cent of the respondents had medium level of awareness regarding developmental aspects of IAY followed by low level of awareness (16.67%) and high level of

Table 4: Distribution of respondents according to their level of awareness about various developmental programmes (N=120)

Programmes	Awareness level (Mean±SD)	Frequency Percentage
BI* IAY		
Low (Below 4.11)	20	16.67
Medium (Between 4.11-9.65)	90	75.00
High (Above 9.65)	10	8.33
AI** NRHM		
Low (Below 7.05)	20	16.67
Medium (Between 7.05-12.97)	99	82.50
High (Above 12.97)	01	0.83

(IAY) BI* = Before Interventions; Mean=6.88, SD= 2.77, Min =00, Max = 11

(IAY) AI** After Interventions; Mean=10.01, SD= 2.96, Min =01, Max = 13

awareness (0.83%). The average levels of awareness after interventions were 10.01 whereas before interventions it was only 6.88. This means that interventions significantly influence the awareness level of respondents.

As perusal of data presented in Table 5, reflected that majority of respondents (90.8%) were aware that the objective of the programme i.e. to provide construct/upgrade dwelling units to Below Poverty Line (BPL) householders. This is because of the popularity of the programme. About 88.3 per cent of the beneficiaries were aware about the target group of IAY (SC, ST freed bonded labourers, minorities and other non-SC/ST that belong to Below Poverty Line) followed by the respondents free to construct their houses in their own ways and they also free to choose the structure and map of the houses (84.2%), Allotment of dwelling units should be in the name of female member of the beneficiary household (81.7%), Indira Awaas Yojana is a Centrally Sponsored Scheme funded on cost-sharing basis between the Government of India and the State Governments in the ratio of 75:25 in plain regions (72.5%), and the Zila Parishad/DRD as responsible for disbursing grant on the basis of progress in house construction to the beneficiaries (56.70%). Here one interesting fact is that only 52.20 per cent of the respondents were aware about the inception of the programme. It is also worthwhile to note that 76.67 per cent of the respondents were not aware that in the North-Eastern States funding is shared by Government of India and the States in the ratio of 90:10 followed

by the ceiling on grant of assistance per unit cost under the Indira Awaas Yojana is up to Rs. 45,000 for plain regions (75%), at least 60 per cent of the total IAY funds and physical targets should be utilized for construction/upgradation of dwelling units for SC/ST BPL households (72.50%), the selection of beneficiaries being done by the block level officials (68.3%). The Central assistance under the Indira Awaas Yojana will be allocated among the States/UTs to rural housing shortage as per Census data and poverty ratio (64.20%) and under IAY progress in construction of a new houses, upgradation and work progress are monitored by Block and State officials (55.80%). This might be due to the fact that majority of respondents have a very little knowledge about the ceiling grant of assistance because of lack of appropriate means of information dissemination. Housing for a poor is a critical infrastructural facility for improvement in the quality of life of rural folk. The finding strongly suggest that there is an urgent need of dissemination of programme related information among the rural people so that they can easily receive the benefits and improve their living condition because it is the only way to increase the propensity for the programme to be accessed by those who are the primary target population and can enhance the efficacy of delivery to such beneficiaries.

The mean differences between before interventions and after interventions were found 3.12 and the 't' value were 23.38 which is highly significant at 1 per cent level of significance. This means that intervention made for creating awareness among the rural people was more effective. In Toto; the overall awareness among the respondents has been significantly increased after the interventions.

It refers to the involvement of rural people at various stages of developmental programmes. Participation may be means to improve project effectiveness through the use of local information to specify problems and needs, improve solution and avoid misunderstanding. Participation can have a range of levels. Drawing on the typologies of White (1996) and Pretty (1995) but also departing from them in notable ways, a typology of these levels as described by Agrawal (2001) has been used for the study purpose. It refers to the involvement of rural people at various stages of developmental programmes. It is evident from this Table 7 that 28.33 per cent of the respondents had nominal level of participation. This means that they were the registered members of the community/

Table 5: Respondents awareness about various aspects IAY programmes (N=120)

S. No.	Awareness components	Awareness percentage			
		BI*		AI**	
		F	%	F	%
1	Indira Awas Yojana was started in 1985 – 86 as a sub scheme of Rural Landless Employment Guarantee Programme (RLEGP).	63	52.20	93	77.50
2	The main objective of the programme is to help families living Below Poverty Line (BPL) in construction/upgradation of dwelling units	109	90.80	114	95.00
3	Indira Awaas Yojana is a Centrally Sponsored Scheme funded on cost-sharing basis between the Government of India and the State Governments in the ratio of 75:25 in plain regions	87	72.50	104	86.67
4	In North-Eastern States funding is shared by Government of India and these States in the ratio of 90:10 respectively	28	23.33	69	57.50
5	The target group under this programme is SC; ST; freed bonded labourers, minorities and other non-SC/ST that belong to Below Poverty Line.	106	88.30	114	95.00
6	Selection of the beneficiaries under IAY is done at block level	38	31.70	59	49.17
7	At least 60% of the total IAY funds and physical targets should be utilized for construction/upgradation of dwelling units for SC/ST BPL households.	33	27.50	75	62.50
8	The houses will be constructed by the beneficiaries themselves. House structure and map depend on the beneficiary's choice.	101	84.20	114	95.00
9	Allotment of dwelling units should be in the name of female member of the beneficiary household.	98	81.70	108	90.00
10	The ceiling on grant of assistance per unit cost under the Indira Awaas Yojana for construction of a new house will be Rs. 45,000 for plain regions	30	25.00	62	51.67
11	The Central assistance under the Indira Awaas Yojana will be allocated among the States/UTs to rural housing shortage as per Census data and poverty ratio.	43	35.80	98	81.67
12	Zila Parishad/ DRDAs are responsible for disbursing grant on the basis of progress in house construction to the beneficiaries	68	56.70	98	81.67
13	Under IAY progress in construction of a new houses, upgradation and work progress are monitored by Block and State officials	53	44.20	93	77.50

*BI= Before Interventions, **AI= After Interventions, F= Frequency, %= Percentage

Table 6: Comparison of the degree of awareness between before and after intervention (N=120)

Awareness	MEAN/SEM				Difference	‘t’ value
	BI(120)		AI (120)			
	MEAN	SEM	MEAN	SEM		
IAY	6.88	.252	10.00	.270	3.12	23.38**

** Significant at 1 % level of significance; BI = Before Interventions, AI = After Interventions

society/plan and organisation. Most of the respondents were not even a nominal member (71.67%) and usually absent in the self initiated group. The 22.50 per cent of the respondents had passive participation. They were the people who attended the meeting and listening decision without giving any comments. They were mostly the literate person and had much experience on various aspects. The 19.17 per cent of the respondents had consultative participation. They were the person who rendered their opinion on specific matters without guarantee of influencing the ultimate decision. They

were mostly active participants at different level of the programmes. Despite their absence from decision making 15 per cent of the respondents were drawn into specific activities of the developmental programmes and had activity specific participation. Only 8.33 per cent of the respondents expressed their opinion on important issues in effective and efficient manners and belonged to active participation group. Their opinion affected the ultimate decisions. Only few respondents (6.67%) had interactive (empowering) participation. It means that they influence the group's decisions. They

Table 7: Distribution of respondents according to their level of participation (N=120)

Level of Participation	Frequency	%
Nominal participation	34	28.33
Passive participation	27	22.50
Consultative participation	23	19.17
Activity- specific participation	18	15.00
Active participation	10	8.33
Interactive(empowering) participation	08	6.67
Total	120	100

were the very enthusiastic in nature and had full knowledge about various developmental programmes meant for rural revmap.

Satisfaction reinforces learning and develops confidence, which generate motivation for further change. It was studied in terms of up to what extent the rural people got satisfied by various elements of developmental programmes. It is clearly reflected from Table 8 that a cumulative of 61.66 per cent of the respondents showed their satisfaction about IAY programme. Out of these, 24.16 per cent were highly satisfied and 37.50 per cent were satisfied. The main reasons for their satisfaction were beneficiaries having freedom to construct houses in their own ways; provided houses to SC/ST/BPL category; priority given in allotment of their houses in name of female member of the family. This ultimately led to upliftment of the socio-psychological conditions of the vulnerable people. The housing facilities not only met a basic need but also increased employment and income of the vulnerable sections of the community.

This finding is in the line with the findings reported by PEO of Planning Commission (1992). The study also revealed that 38.34 per cent of the beneficiaries were not satisfied with this particular programme. The important reasons for their dissatisfaction, as reported during study were identification and selection of household for allotment; adopted monitoring and

Table 8: Distribution of respondents according to their level of satisfaction from IAY (N=120)

Level of satisfaction	Frequency	Percentage
Highly satisfied	29	24.16
Satisfied	45	37.50
Not satisfied	46	38.34

review procedures to inspect the work progress; criteria used for house construction/upgradation and economic assistance, and funding were not made transparent. The rising cost had dampening effect in the housing sectors and the need of hour is to promote low cost and environmentally appropriate combined with indigenous resources. Through guideline prohibits the involvement of contractors for construction of houses, but some houses being constructed by contractors. However, a significant number of people were satisfied with IAY because it provided the shelter to those who needed it most.

The data with regard to the level of satisfaction of respondents with various aspects of IAY have been presented in Table 9. It is evident from this table that 52.5 per cent respondents were highly satisfied with the provision of allotment of dwelling units should be in the name of female member or in the name of both husband and wife under IAY, whereas 46.7 per cent respondents said that they were highly satisfied that they are free to construct houses in their own ways, 34.2 per cent respondents were highly satisfied with the provision of at least 60% of the total IAY funds and physical targets should be utilized for construction/upgradation of dwelling units for SC/ST/BPL households under this scheme and only 25.8 per cent of the respondents expressed their satisfaction with the work of house construction/upgradation under IAY. This may be due to the fact that the authorities are bounded to select the respondents belonging to vulnerable categories on the basis of their income and it is not being performed in a transparent ways.

The Table also shows that about 91.7 per cent respondents expressed their satisfaction with the provision of allotment of houses in name of female members/both (male and female) followed by the work that performed under IAY for house construction/upgradation (80.8%) and freedom given to respondents for dwelling construction in their own ways (78.4%). The main reason for their satisfaction with the IAY programme was that they were able to fulfill the socio-cultural need for their better life style. This finding is almost similar to the finding reported by Lahiry (1996). With regard to un-satisfaction, 67.50 per cent of the respondents were not satisfied with the monitoring, evaluation and review procedure followed under IAY. They agree that there are a lot of loop hole in this procedural issue. The officials were not monitoring the programme components right from selection of the

Table 9: Distribution of respondents according to their level of satisfaction from various aspects/components of IAY (N=120)

S.No.	Programmes components	Response category					
		HS	%	S	%	NS	%
1.	The work of house construction and upgradation under IAY	31	25.8	66	55	23	19.2
2.	Economic assistance that provided for house construction	12	10	56	46.7	52	43.3
3.	At least 60% of the total IAY funds and physical targets should be utilized for construction/up gradation of dwelling units for SC/ST BPL households	41	34.2	42	35	37	30.8
4.	The provision of total dweller determined by the District Panchayat, Zila Parishad/DRDA	27	22.5	35	29.2	58	48.3
5.	Beneficiaries under IAY are free to construct the houses in their own ways	56	46.7	38	31.7	26	21.7
6.	The provision of Allotment of dwelling units should be in the name of female member or in the name of both husband and wife	63	52.5	47	39.2	10	8.3
7.	Economic assistance provided for upgradation of an unserviceable house under this Act	17	14.2	46	38.3	57	47.5
8.	The criterion adopted for house construction under IAY	12	10	34	28.3	74	61.7
9.	Water facilities provided in constructed houses rectification within prescribed period of time	19	15.9	26	21.6	75	62.5
10.	Monitoring, evaluative study and review procedure under this programme	07	5.8	32	26.7	81	67.5

respondents to construction/upgradation of dwelling unit in appropriate ways and time. This is a bitter truth that this process is not being performed honestly by the officials, followed by the water facilities provided in constructed houses (62.5%), criterion adopted for construction (61.7%), the provision of total number of respondents decided by DRDA/Zila Parishad/District Panchayat and the economic assistance provided for upgradation of unserviceable houses (47.5%). Nearly 62.5 per cent of the households lived in the houses which did not fulfill the standards. The drinking water facility at village level was very poor. So, it needs to be managed in an effective manner for strong economic boosting. This finding is more or less similar to Munsri (2001) finding. The study pointed out that the method of identification of households for allotment of houses under IAY needs to be further streamlined to ensure shelter to the needy poor. Majority of the respondents living in rural settings were unable to bear the rising cost of building materials, so they also need information about alternative construction technology that should be low cost and effective.

It refers to the factors that are working as barriers in obtaining benefits from IAY. Table 10 reflects that 14.72 per cent of the respondents were facing constraints as lack of proper attention given on drinking water facility, smokeless chulha and toilet facility at the time

of dwelling construction under the scheme followed by lack of appropriate attention on preventive measures against natural calamities during construction (12.44%). The similar result was reported by Sen (1996). He found in the pilot study conducted in village of Haryana and revealed that no sanitation facilities were built in any of the houses. Only two or three houses were exception of it as they were having toilets and smokeless chullah or other cooking facilities have not been incorporated. Sharma (1996) reported that there was lack of basic facilities such as drinking water, toilet facility etc. were major constraints. Munsri (2001) reported that only 6.54 per cent of the households had latrine facilities, so the sanitation and personal arrangement of latrines were abnormally poor in the study areas. A total of 11.84 per cent of the respondents said that the fixed limit of advances (Rs. 50,000) for construction of dwelling was not sufficient for dwelling construction at the present cost of construction. This finding is in the line with the findings reported by Misra (1996); Sharma (1996) and Lahiry (1996). The 11.53 per cent of the respondents pointed out that there was lack of use of low cost construction technologies and lack of appropriate methods of information dissemination regarding this technology also created hindrance in dwelling construction. Low cost construction technologies reduce the cost of construction up to 25-30 per cent if the new materials and technologies are prudently used (Karim

Table 10: Distribution of respondents according to their perceived constraints towards IAY

S.No.	Constraints	F	%*	%**
1.	Lack of transparency in the selection of appropriate beneficiaries and utilization of the benefit	60	9.10	50
2.	Lack of disbursement of economic assistance at a time for construction /upgradation of dwelling	63	9.56	52.5
3.	Lack of proper attention in providing drinking water facility, smokeless chulha and toilet facility at the time of dwelling construction	97	14.72	80.8
4.	Problems in Sanctioning the loan at appropriate time in required quantity for construction of houses	64	9.71	53.3
5.	Advances amount Rs. 50,000 for construction of dwelling is meager as cost of construction	78	11.84	65
6.	Involvement of contractors in construction of IAY houses	18	2.73	15
7.	Lack of appropriate attention on preventive measures against natural calamities at the time of construction	82	12.44	68.3
8.	Lack of inspection, monitoring, and evaluation of constructed houses by Block officials	61	9.26	50.8
9.	Selection of beneficiaries not done through the proper procedures	60	9.10	50
10.	Lack of use of low cost technology at the time of construction of dwelling and also lack of appropriate information dissemination among rural people	76	11.53	63.3

*Percentage of multiple responses (N=659), **Percentage of respondents (N=120)

1996). So there is an urgent need to focus on this particular issue and disseminate the information at the grass root level. The 9.71 per cent respondents were facing problems in sanctioning the loan at appropriate time in required amount followed by lack of disbursement of economic assistance at the time of construction/upgradation of dwelling (9.56%), lack of inspection, monitoring and evaluation by officials (9.26%) and lack of transparency in selection of beneficiaries (9.10%). Similar findings also reported by Misra (1996) and Lahiry (1996). Only 2.73 per cent of the respondents said that there was involvement of contractors in construction of IAY houses. This finding is in the line with the findings reported by PEO of Planning Commission (1992). It is suggested that care should be taken in identifying the needy people who require house sites; need to develop cost effective technology through information dissemination; innovative planning and architectural design, Government should play the role of a facilitator, The NGOs need to be associated in the implementation of the programmes, efforts should be made to attach sanitary latrine to rural houses through mobilization of voluntary efforts and mobilizing the financial resources in an easy manners. If all these measures are taken into consideration it will surely improve housing activity to provide adequate shelter.

The independent variables namely education, caste category and family type are positively correlated with the awareness level of the respondents at 1 per cent

level of significance whereas, income are negatively associated with level of awareness. Thus it can be inferred that variables namely, education, caste, family type and income exerts their influence significantly on awareness level of the respondents about IAY (Table 11).

The independent variables like age, education, caste, land holdings, family size, occupation, income and farming experience were positively significant at 1 per cent level of significance. This clearly concluded that above variables exerts their influence significantly on participation level of the respondents. From the Table 11 it apparently reflects that the variables namely, age,

Table 11: Relationship between selected independent variables with the dependent variables

Independent variable	Correlation 'r' value		
	Aware-ness	Partici-pation	Satis-faction
Age	-.116	.418**	.277**
Education	.595**	.729**	-.351**
Caste category	.367**	.309**	.356**
Land holdings	-.035	.776**	.442**
Family type	.292**	.139	-.098
Family size	-.164	.254**	-.339**
Occupation	-.059	.448**	-.144
Income	-.242**	.720**	.419**
Farming Experience	-.108	.669**	.518**

**Significant at the 0.01 level of significance

education, caste category, land holdings, family size, income and farming experience exerts their influence significantly on satisfaction level of the respondents from IAY.

CONCLUSION

Housing for the poor is a critical factor of social life. A decent house can solve many problems for the poor households. However, housing is only one necessity. Access to housing facilities alone cannot raise the poor households from the poverty trap but it also need basic infrastructural facilities along with housing and employment opportunities to improve their living conditions. Hence, in any policy for improving housing facilities for the poor, it is important to consider ways in which the poor people can have access to a total package to improve their quality of life where housing would constitute an important component amongst others. The government needs to create awareness, encourage and ensure full community participation through effective propagation of relevant information, necessary institutional arrangements through which individual, family and community as whole can receive the full benefits of the programme. Efforts are taken to inform about sanitary aspects, alternative construction technologies. It is doubtless that the rural – urban divide in housing will continue to prevail for long, but the degree of differences certainly calls for interventions in rural areas.

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Knowledge and Adoption Level of the Farmers of Haryana about Scientific Rice Cultivation Practices

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ABSTRACT

Rice (*Oryza sativa*) occupies a pivotal place in Indian agriculture. Rice cultivation practices must be ensured to attain the goal of agricultural sustainability. A survey was undertaken to study the knowledge and adoption of scientific rice cultivation practices in Haryana covering four districts viz; Karnal, Kurukshetra, Kaithal and Ambala. From each district two blocks, from each block one village and from each village 20 farmers were selected by using stratified random sampling technique. Data were collected by using personal interview method during 2011 from small, medium and large farmers proportionately. Majority of the farmers (63.75%) had medium level of knowledge and adopted (75.62%) of scientific rice cultivation practices. The large farmers had comparatively higher level of knowledge and adoption rate than medium and small farmers. The extension agencies should organize the awareness programme to increase level of knowledge and adoption of rice cultivation practices to sustain rice production in Haryana.

Keywords: Adoption, Knowledge, Rice, Scientific cultivation practices

INTRODUCTION

The Indo-Gangetic Plains (IGP) is of great importance for the food security of India. During the green revolution period in the early 1960s, production increased through area expansion and intensification of the rice-wheat system. Agriculture will have to face two major challenges in the twenty first century in spite of significant advances made in the past: how to feed the growing population, and how to respond to increasing concerns to sustainable use of natural resources. These challenges are more important especially for India having large population (16% of the world), which is relatively less endowed with land and natural resources (2% of the world arable land). India's population is projected to 1.30 billion by 2020 AD. On the other hand, on the basis of various cereals demand and supply projection scenarios, cereal supply should be increased up to 260 million tons, assuming a reasonable increase in crop production and efficiency of resources. Thus, cereals demand will increase by 3.7 per cent per annum, resulting in demand and supply gap of 36 million tonnes by 2020. The total food grain production was 241.57 million tones during 2010-11, which is higher than the

preceding years. The rice production was 95.33 million tons in 2010-11. It is grown in an area of 41.92 million ha. in India, out of which Haryana occupies 1.21 million ha. Haryana state is producing 4.07 per cent of rice from 2.87 per cent area of the country. The average productivity of rice of the state is 2789 kg/ha during 2010-11 (Anonymous, 2011). An attempt has been made in this paper to assess the knowledge and adoption level of the farmers about scientific rice cultivation practices so that necessary steps could be taken to enhance rice productivity in Haryana.

MATERIALS AND METHODS

The study was conducted purposively in Haryana state. Four districts of Haryana viz; Karnal, Kurukshetra, Kaithal and Ambala were purposively selected based on their crop productivity. From each district two blocks, from each block one village and from each village 20 farmers were selected by using stratified random sampling technique, thereby constituting a sample of 160 farmers. Data were collected by using personal interview method during 2011 from small, medium and large farmers proportionately. The family head of the selected households who yielded maximum influence in

decision making with regard to crop cultivation constituted the respondent. For knowledge level, different scores were given to right and wrong answers for various practices. For adoption level, all the questions in adoption were dichotomous having two dimensions, Yes/No, assigned score 1 for 'yes' and 0 for 'no' response. Statistical tools like mean, standard deviation, simple frequency and percentage were used to analyze the data.

RESULTS AND DISCUSSION

Ascertaining the level of knowledge and adoption among farmers was done to enable them to sustain rice production. In this study, knowledge and adoption were perceived as the level up to which different practices were known and adopted by the sampled farmers. Further, practice-wise knowledge and adoption were also calculated to see the extent of knowledge and adoption. Knowledge and adoption level of the farmers regarding scientific rice cultivation are described in the following paragraphs:

Knowledge plays an important role in decision making process. It is the precursor to the adoption of any innovation. It might be difficult to presume the level of adoption of a technology unless it is first known to the person who is going to adopt it. Majority (63.75%) of the farmers had medium level of knowledge about scientific rice cultivation practices followed by high (23.13%) and low (13.12%) (Fig. 1).

More numbers of large farmers were having high level of knowledge compared to medium and small categories of farmers (Table 1). Mathur (1970) also reported that final decision of farmers to use a new practice depends upon the level of knowledge possessed about that the practice. Sagwal and Malik (2001) reported that majority of the respondents had low to medium level of knowledge regarding overall rice production technologies. Yadav (2005) also reported that majority of the respondents were having medium level of knowledge about rice cultivation practices.

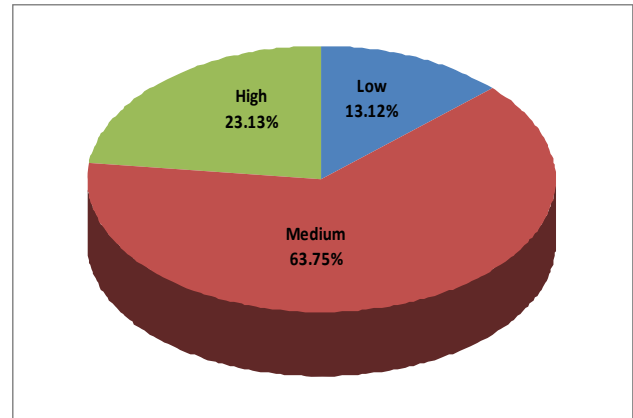


Fig. 1: Knowledge level of farmers of rice cultivation practices

The data further indicated that more than 80 per cent of the farmers were having knowledge about the high yielding varieties, optimum age of seedlings and plant population/sq m for timely sown crop. About 54 per cent farmers were having knowledge about the transplanting of seedlings/hill and herbicides used for chemical weed control. About 47 per cent farmers were having the knowledge of common diseases of rice and chemical required to treat the rice seed. About 29 per cent farmers knew about the recommended dose of N,P,K and Zn. About 38 per cent farmers had knowledge of the how many days standing water should be retained for plant establishment. Only 2.5 per cent farmers were having knowledge of the symptoms of blast disease in rice (Table 2). Pandey (2010) reported that about 68.75 per cent respondents had high level of knowledge about the modern rice varieties, whereas, majority of the respondents of Bilaspur district in Chhatisgarh state i.e. 71.25, 66.25 and 76.24 per cent had low to medium level of knowledge about seed treatment, balanced fertilizer and plant protection measures, respectively. Sagwal *et al.* (1997) also reported that the farmers had inadequate knowledge about seed treatment, recommended dose of fertilizers, insects and diseases of rice cultivation.

Table 1: Distribution of farmers according to knowledge level of rice cultivation practices (N=160)

Mean score	Knowledge level	Frequency of the respondents			
		Small	Medium	Large	Total
12.67	Low (up to 9.39)	10	7	4	21
	Medium (9.40-15.94)	33	37	32	102
	High (Above 15.94)	10	9	18	37

Table 2: Knowledge of the farmers about scientific rice cultivation practices (N=160)

Practices	Frequency (%)
Names of high yielding varieties (HYVs) recommended for the area	136 (85.00)
Optimum age of seedlings required for transplanting	139 (86.88)
Plant population/sq m for timely sown crop	130 (81.25)
No. of seedlings should be transplanted per hill	87 (54.38)
Recommended dose of fertilizer to be applied for rice crop	46 (28.75)
For how many days standing water should be retained for plant establishment	61 (38.12)
Herbicides used for chemical weed control	86 (53.75)
Major diseases of rice	75 (46.88)
Chemical required to treat the rice seed	76 (47.50)
Symptoms of blast disease of rice	4 (2.50)

Lack of soil testing facility in the nearby areas, less knowledge of balanced dose of fertilizers and lack of complete knowledge of the package of practices had been major constraints for the farmers. It is necessary that the extension workers should make more efforts to educate farmers about package of practices of rice crop. The policy makers should take appropriate steps to create soil testing facilities in the nearby areas or soil samples be collected from each village and provide the soil report to all the farmers so that they can apply balanced fertilizers in all the crops.

Three-fourths of the farmers had medium, 16.25 per cent low and 8.13 per cent had high level of adoption of scientific rice cultivation practices (Fig. 2).

The large farmers had comparatively higher level of adoption of scientific cultivation of rice than the medium and small categories of farmers (Table 3). These findings were in consonance with the reports of Sherawat and Kharub (1993) and Singh and Varshney

(2010) that majority of the farmers had medium level of adoption of rice recommended technologies followed by low and high. Singh and Baruah (2011) have reported that farmers, by and large, had low and medium level of adoption of improved rice cultivation practices under the selected farming systems. Extension agencies should be geared up and continue their efforts including organizing different farmers' level training programmes so that they can develop confidence in them to take up rice technology.

The results further indicated that more than 95 per cent farmers were adopting the recommended high yielding varieties, nursery transplanting at the age of 25-30 days, applying herbicides for weed control within 3-7 days of rice transplantation (Table 4). About 87 per cent farmers were maintaining the optimum level of water in the field during the first fortnight of transplantation for better establishment of rice crop. Fifty nine per cent farmers were treating the seed of rice before sowing whereas 52.50 per cent farmers applied pesticides for control of blast disease. Only 39.38 per cent farmers were maintaining desired plant population/sq m. About 48.12 per cent farmers were applying recommended dose of NPK and Zinc fertilizer for rice because they were using NPK fertilizer (12:32:16) as a source of fertilisers. Diagnostic surveys (Yadav *et al.*, 2000) indicated that farmers of Punjab, Haryana and Western Uttar Pradesh were using very high doses of N (130-195 kg N/ha) to non-basmati rice. Application of 11 to 14 kg P/ha was common in these areas, but K fertilizer was limited. Singh and Varshney (2010) reported that adoption of correct dose of fertilizers and manure as also the recommended variety was the highest (75% and 65 % respondents) followed by seed treatment with fungicides (61%), plant protection (53%) and herbicide application (52%). They

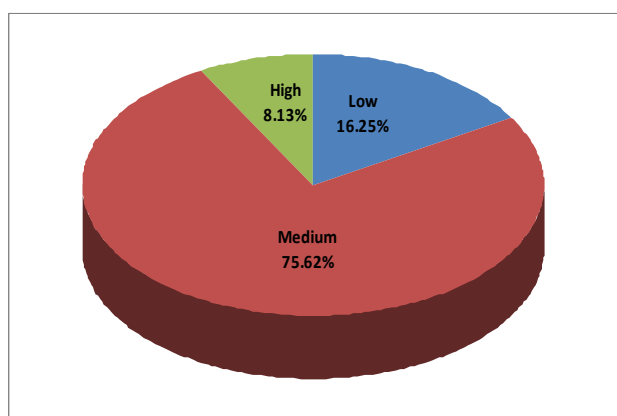
**Fig. 2: Adoption level of farmers of rice cultivation practices**

Table 3: Distribution of farmers according to adoption level of scientific rice cultivation practices (N=160)

Mean score	Adoption level	Frequency of the respondents			
		Small	Medium	Large	Total
6.68	Low (up to 5.32)	11	11	4	26
	Medium (5.33- 8.04)	37	40	44	121
	High (Above 8.04)	5	2	6	13

Table 4: Adoption of scientific rice cultivation practices (N=160)

Rice cultivation practices	Frequency (%)
Use of high yielding varieties	154 (96.25)
Transplant nursery at the age of 25-30 days	153 (95.63)
Maintenance of desired plant population /sq m	63 (39.38)
Application of recommended dose of NPK and Zinc fertilizer in rice	77 (48.12)
Maintenance of optimum level of water in the field during first fortnight of transplantation	139 (86.88)
Application of herbicides for weed control	157 (98.13)
Application of herbicide within 3-7 days of rice transplantation	154 (96.25)
Application of pesticides for control of blast disease	84 (52.50)
Seed treatment of rice before sowing	95 (59.38)

also reported that majority of the farmers did not maintain plant population in main field. Kumbhare and Singh (2011) reported that 60 per cent farmers had high level of adoption of the rice production technologies followed by medium (21.25%) and low (18.75%).

CONCLUSION

Majority of the farmers had medium level of knowledge and adoption of scientific rice cultivation. The large farmers had comparatively higher level of knowledge and adoption about scientific cultivation of rice than the medium and small categories of farmers. There is a need to create awareness among the farmers about scientific rice cultivation practices through various extension methods. It is recommended that greater emphasis should be given to educate the farmers about complete package of practices of rice crop rather than only focusing on improved varieties, age of nursery and plant population. Seed to seed knowledge is one of the important ways to increase productivity of rice and upliftment of the farming community. The policy makers have an important role to formulate schemes for smooth flow of technologies.

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Studying the Farmers' Response towards Technology Interventions Under Assessment and Refinement

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ABSTRACT

Farmer's response towards technology assessment & refinement was studied in five villages of Ranchi District in Jharkhand. Result revealed that all the intervened technologies assessed by the farmers were found to be agro-climatically more suitable, more profitable and more compatible contributing to their overall appropriateness in comparison to the corresponding farmers' practices. Overall reaction of the respondents on intervened technologies was found to be positive in terms of selected attributes i.e. socio-cultural compatibility, compatibility with existing farming system components, divisibility of technology, simplicity, compatibility with internal resources of the households, element of risk involved and visibility except their easy availability in the local markets. Majority of the farmers felt difficulties in accepting the recommended technologies as such in respect of most of the intervened technologies and preferred the refined technologies which were suitable in their agro-ecological situation and socio-economic condition.

Keywords: Farmers response, Technology intervention, Refinement

INTRODUCTION

Technology assessment and refinement is an intermediate process between formal research and formal extension. It is carried out in the framework of farmer participatory approaches which starts and ends with farmers' perspectives. Farmers' perspective refers as to how farmers view the technologies in their circumstances. Farmers' response towards different technological interventions were studied in terms of farmers' reaction/feedback, changes in cognitive domain, farm women's involvement and availability of inputs, etc. for the accepted treatments which were likely to be practiced in future. The major findings have been discussed in the following sub-heads:

- i. Farmers' assessment of the interventions
- ii. Farmers' reaction to different treatments of on farm trials (OFT) and verification trails (VT).
- iii. Matrix ranking of different treatments under on-farm trails.

MATERIALS AND METHODS

The study was undertaken in the five purposively selected villages of Karge panchayat in Mandar Block, namely, Karge, Rege, Hatma, Chatwal and Keskani-kumbatoli

in Ranchi district. The rationale behind selection of the villages was their adoption under Institution - Village Linkage Programme of Birsa Agricultural University Center, where demonstrations and OFT were conducted for assessment and refinement of technologies. Three categories of respondents, namely, demonstrating farmers, experimenting farmers and participating farmers were selected from each of the five adopted villages related to demonstrations, verification trials and on-farm trials conducted on important vegetables, viz., tomato, and brinjal. Rationale behind selecting these vegetable crops were their predominance in the study villages.

All the demonstrating farmers (60), experimenting farmers (60) and 25% of the participating farmers from the selected villages (150) constituted the sample for data collection. Thus, the whole sample consisted of 270 respondents. Selection of demonstrating farmers and experimenting farmers was done on the basis of purposive sampling technique and selection of participating farmers was done on the basis of simple random sampling technique. Village-wise distribution of respondents has been presented in Table 1.

According to Ganadharappa (1996), assessment of technology refers to its relative advantage, compatibility, complexity, feasibility/divisibility and absorbability/

Table 1: Village-wise distribution of different categories of respondents

Village	Experimenting farmers (n=60)	Demonstrating farmers (n=60)	Participating farmers (n=150)	Total (n=270)
Karge	20 (33.33)	20 (33.33)	55 (36.66)	95 (35.18)
Rege	10 (16.66)	10 (16.66)	30 (20.00)	50 (18.50)
Hatma	15 (25.00)	15 (25.00)	25 (16.66)	55 (20.37)
Chatwal	10 (16.66)	10 (16.66)	25 (16.66)	45 (16.66)
Kesheskani- kumba toli	5 (8.35)	5 (8.35)	15 (10.00)	25 (9.28)
Total	60(100.00)	60(100.00)	150(100.00)	270(100.00)

Figures in parantheses indicate percentages

communicability. “As it is clear from the above statement that there are many criteria to assess a technology. But considering better understanding, four criteria, namely, (1) agro-climatic suitability (2) operational feasibility (3) profitability and (4) compatibility were decided for assessment of the technologies by the respondents.

Agroclimatic suitability: It refers to that aspect of technology which results to enrich the environment or at least does not harm the existing agro-ecological condition.

Operational feasibility: It refers to how far agricultural technologies be it a seed, fertilizer, pesticides or improved machinery suits the infrastructural situation of the end users and how far they bring that technology into practice.

Profitability: It refers to how much a technology adds to income level of farmers. It was measured in terms of return per rupee investment.

Compatibility: It refers to the extent to which a technology is adaptable to existing socio-cultural and existing farming conditions of the farmers.

The four criteria were used for assessment of the intervened technologies on the basis of farmers’ perceptions and experiences. Perception is the process of organizing and interpreting sensory data by combining them with the results of previous experiments. The way people interpret the technology by and large determines its acceptance or rejection.

In the present study perception refers to “the mental perceptual evaluation by a respondent about designed attribute of the intervened technology. The perception on attributes of intervened technologies by the respondents was measured with the help of a well structured and pre-tested schedule developed for this purpose. The responses for intervened technologies on

selected attributes, namely, agro-climatic suitability, operational feasibility, profitability and compatibility were obtained on a 3-point rating scale. The points on the rating scale were most suitable, moderately suitable and least suitable quantified by giving scores of 3, 2 and 1 respectively. The weighted mean scores of the individual technologies were then calculated. The technologies which were assigned mean scores above 2.5, between 2.5 to 1.5 and below 1.5 were considered to be most appropriate, moderately appropriate and least appropriate. Farmers reaction towards intervened technologies was measured in terms of their perceptions. The ways people interpreted the technology by and large determine its acceptance or rejection. This interpretation depends on their past experience, their general attitude to life, the value of social system and also in some cases the personality. Therefore, the acceptance or rejection and continuance or discontinuance of the technology could be based on the reaction of the users.

In the present study reaction has been defined as the process of organizing and interpreting the data on the results of intervened technologies through OFT, VT and demonstrations conducted on vegetable production technologies. The farmers’ reaction to experimented and demonstrated technologies was measured with the help of scoring system developed on a 5-point rating scale on 8 selected attributes of the technologies i.e. socio-cultural compatibility, compatibility with existing farming system components, divisibility of technology, simplicity, compatibility with internal resources of the household, availability of related input/material, element of risk involved and visibility with their scores given in parantheses as most suitable (5), suitable (4), moderately suitable (3), least suitable (2) and unsuitable (1). Then the overall reaction was calculated and classified into three categories i.e. negative (< 2.5), neutral (2.5-3.5) and positive (> 3.5).

According to Rogers (1967) farmers use to modify the technology interventions as per their bio-physical and socio-economic situations as well as the operational feasibility. This process is also called as re-innovation. Refinement refers to the validation, integration and re-innovation of agricultural technology at the local level or situation by involving all the partners of agricultural development (Gangadharappa, 1996). In order to seek the farmers' preference on refinement of the technology interventions based upon the on-farm trials conducted under the programme, matrix scoring technique of PRA was employed for eliciting the farmers' preference of technology interventions. Ranking was done by the

farmers for each of the treatments of OFT on the basis of farmer's own criteria. Matrix ranking was accomplished through farmer/participatory approach.

RESULT AND DISCUSSION

Under this study the intervened technologies were got assessed by the respondents on four attributes i.e. agro-climatic suitability, operational feasibility, profitability and compatibility and then the overall appropriateness of the technologies was calculated. The data on farmers' assessment of wilt resistant varieties of tomato have been presented in Table 2.

Table 2: Frequency distribution of respondents according to their assessment of wilt resistant varieties of tomato in small production systems (N=20)

Technology Criteria	T ₁ =Farmers practice (Use of wilt susceptible varieties i.e. punjab keshri, punjab chohara)	T ₂ =Wilt resistant variety (Arka alok under farmers management)	T ₃ =Wilt resistant variety (Arka abha under farmer management)	Value of X ²
Agro-climatic suitability				
Most suitable	4 (20)	14 (70.00)	15 (75.00)	9.66*
Moderately suitable	3 (15)	3 (15.00)	14 (20.00)	
Least suitable	13 (65)	3 (15.00)	1 (5.00)	
Total	20 (100)	20 (100.00)	20 (100.00)	
Mean score	1.55	2.55	2.70	
Operational feasibility				
Most suitable	5 (25.00)	12 (60.00)	14 (70.00)	10.22*
Moderately suitable	4 (20.00)	6 (30.00)	4 (20.00)	
Least suitable	11 (55.00)	2 (10.00)	2 (10.00)	
Total	20 (100)	20 (100)	20 (100.00)	
Mean score	1.70	2.50	2.60	
Profitability				
Most suitable	2 (10.00)	17 (58.00)	18 (90.00)	10.68*
Moderately suitable	3 (15.00)	3 (15.00)	2 (10.00)	
Least suitable	15 (75.00)	-	-	
Total	20 (100)	20 (100)	20 (100.00)	
Mean score	1.35	2.85	2.90	
Compatibility				
Most suitable	4 (20.00)	13 (65.00)	16 (80.00)	25.02*
Moderately suitable	6 (30.00)	4 (20.00)	2 (10.00)	
Least suitable	10 (50.00)	3 (15.00)	2 (10.00)	
Total	20 (100)	20 (100)	20 (100.00)	
Mean score	1.70	2.50	2.70	
Overall appropriateness				
Most appropriate	4 (20.00)	14 (70.00)	16 (80.00)	24.02*
Moderately appropriate	4 (20.00)	4 (20.00)	3 (15.00)	
Least appropriate	12 (60.00)	2 (10.00)	1 (5.00)	
Total	20 (100)	20 (100)	20 (100.00)	
Mean score	1.60	2.60	2.75	

Figures in parentheses indicate percentages; Significant at 5% level

Table 2 shows that wilt resistant varieties Arka Alok and Arka Abha were found to be agro-climatically more suitable, operationally more feasible, more profitable, more compatible and most appropriate compared to farmers' variety which was susceptible to wilt. However, Arka Abha was rated as the most appropriate variety by 80 per cent of the respondents and Arka Alok as the most appropriate by 70 per cent of the respondents.

The data on assessment of technology related to soil treatment for wilt management i.e. application of bleaching powder and lindane dust have been presented in Table 3. As it appears from Table 3, application of 6 kg bleaching powder + 12 kg lindane dust/ha before 15 days of transplanting was found to be significantly

more agro-climatically suitable, operationally feasible, profitable, compatible and appropriate than the farmers' practice (Traditional method of land preparation without soil treatment). The data on farmers' assessment of wilt resistant varieties of brinjal have been presented in Table 4.

Table 4 shows that wilt resistant varieties Swarnshree and Swarnmani intervened under the treatments (T_2 & T_3) were found to be significantly superior to T_1 i.e. farmers' practice in relation to agro-climatic suitability, operational feasibility, profitability, compatibility and appropriateness. However, in case of variety Swarnshree majority of the respondents (70%) observed it to be agro-climatically most suitable, operationally most

Table 3: Frequency distribution of respondents according to their assessment of soil treatment technology for controlling wilt in tomato under well-endowed production systems (N=20)

Technology Criteria	T_1 = Farmers' practice (Traditional method of land preparation without soil treatment)	T_2 = Soil application of 6 kg bleaching powder + 12 kg lindane dust/ha before 15 days of transplanting	Value of X^2
Agro-climatic suitability			
Most suitable	4 (20.00)	15 (75.00)	9.66*
Moderately suitable	3 (15.00)	4 (20.00)	
Least suitable	13 (65.00)	1 (5.00)	
Total	20 (100)	20 (100)	
Mean score	1.55	2.70	
Operational feasibility			
Most suitable	3 (15.00)	16 (80.00)	12.38*
Moderately suitable	2 (10.00)	2 (10.00)	
Least suitable	15 (75.00)	2 (10.00)	
Total	20 (100)	20 (100)	
Mean score	1.40	2.70	
Profitability			
Most suitable	3 (15.00)	18 (90.00)	13.64*
Moderately suitable	2 (10.00)	2 (10.00)	
Least suitable	15 (75.00)	-	
Total	20 (100)	20 (100)	
Mean score	1.40	2.90	
Compatibility			
Most suitable	6 (30.00)	14 (70.00)	11.74*
Moderately suitable	4 (20.00)	5 (25.00)	
Least suitable	10 (50.00)	1 (5.00)	
Total	20 (100)	20 (100)	
Mean score	1.80	2.70	
Overall appropriateness			
Most appropriate	4 (20.00)	15 (75.00)	11.79*
Moderately appropriate	3 (15.00)	4 (20.00)	
Least appropriate	13 (65.00)	1 (5.00)	
Total	20 (100)	20 (100)	
Mean score	1.55	2.70	

Figures in parentheses indicate percentages; Significant at 5% level

Table 4: Frequency distribution of respondents according to their assessment of wilt resistant varieties of brinjal in small production systems (N=20)

Criteria \ Technology	T ₁ = Farmers' practice (use of traditional varieties)	T ₂ = Wilt resistant (variety Swarnshree) under farmers management condition	T ₃ = Wilt resistant variety (Swarnmani) under farmers management	Value of X ²
Agro-climatic suitability				
Most suitable	6 (30.00)	14 (70.00)	16 (80.00)	13.34*
Moderately suitable	7 (35.00)	4 (20.00)	2 (10.00)	
Least suitable	7 (35.00)	2 (10.00)	2 (10.00)	
Total	20 (100)	20 (100.00)	20 (100.00)	
Mean score	1.95	2.60	2.70	
Operational feasibility				
Most suitable	7 (35.00)	16 (80.00)	12 (60.00)	14.64*
Moderately suitable	4 (20.00)	3 (15.00)	6 (30.00)	
Least suitable	9 (45.00)	1 (5.00)	2 (10.00)	
Total	20 (100)	20 (100)	20 (100.00)	
Mean score	1.90	2.75	2.50	
Profitability				
Most suitable	4 (20.00)	13 (65.00)	14 (70.00)	11.61*
Moderately suitable	3 (15.00)	5 (25.00)	6 (30.00)	
Least suitable	13 (65.00)	2 (10.00)	-	
Total	20 (100)	20 (100)	20 ((100.00)	
Mean score	1.55	2.55	2.70	
Compatibility				
Most suitable	4 (20.00)	15 (75.00)	16 (80.00)	12.74*
Moderately suitable	2 (10.00)	3 (15.00)	3 (15.00)	
Least suitable	14 (70.00)	2 (10.00)	1 (5.00)	
Total	20 (100)	20 (100)	20 (100.00)	
Mean score	1.50	2.65	2.75	
Overall appropriateness				
Most appropriate	5 (25.00)	14 (70.00)	15 (75.00)	13.78*
Moderately appropriate	4 (20.00)	4 (20.00)	4 (20.00)	
Least appropriate	11 (55.00)	2 (10.00)	1 (5.00)	
Total	20 (100)	20 (100)	20 (100.00)	
Mean score	1.70	2.60	2.70	

Figures in parentheses indicate percentages; * Significant at 5% level

feasible (80%), most profitable (65%), most compatible (75%) and most appropriate (70%) in their own management practices. However, Swarnmani under farmers' management was perceived to be climatically most suitable (80%), operationally most feasible (60%), most profitable (70%) and most compatible (80%) accounting to most appropriate (75%). The findings presented in the preceding paragraphs indicated that all the intervened technologies assessed by the farmers were found to be agro-climatically more suitable, operationally more feasible, more profitable and more compatible contributing to their overall appropriateness in comparison to the corresponding farmers' practices. Farmers reaction were elicited through scoring technique

of PRA in the framework of focused group interview. The data are presented in Table 5.

Table 5 shows that wilt resistant tomato varieties Arka Alok and Arka Abha under farmers' management condition were rated positive in terms of socio-cultural compatibility, compatibility with farming system components, simplicity, compatibility with internal resources of households, element of risk involved and visibility. However, the two varieties in terms of divisibility and easy availability were negatively rated. The farmers' varieties Punjab Keshri and Punjab Chohara were rated positive in terms of compatibility with internal resources of households and easy availability of the seed.

Table 5: Farmers' reaction towards intervened technologies on selected attributes (N=270)

Crop	Treatment	Socio cultural compatibility	Compatibility with farming system components	Divisibility of technology	Simplicity	Compatibility with internal resource of household	Easy availability of related input material	Element of risk involved	Visibility	Overall reaction
Tomato	T ₁ = Farmers practice (use of wilt susceptible varieties i.e. punjab keshri & punjab chohara)	3.00	1.50	1.50	2.00	4.00	3.50	1.00	2.00	2.31
	T ₂ = Wilt resistant variety (Arka alok) under farmers management	4.50	4.00	1.50	4.50	4.00	1.50	1.50	3.50	3.12
	T ₃ = Wilt resistant variety (Arka abha) under farmers management	4.00	4.00	1.50	4.50	4.00	1.50	4.00	4.00	3.44
Tomato	T ₁ = Farmers practice (Traditional method of land preparation without soil treatment)	1.50	1.00	3.00	2.50	2.00	3.50	1.50	2.50	2.19
	T ₂ = Soil application of 6 kg bleaching powder + 12 kg Lindane dust/ha before 15 days of transplanting	3.62	4.50	4.50	4.00	4.00	1.50	2.00	3.50	3.45
Brinjal	T ₁ = Farmers practice (use of traditional varieties)	2.50	3.00	3.50	4.00	4.00	3.00	1.50	1.50	2.88
	T ₂ = Wilt resistant variety (Swarnshree) under farmers' management condition	4.50	4.50	1.50	4.00	4.00	1.50	4.50	3.50	3.50
	T ₃ = Wilt resistant variety (Swarnmani) under farmer management condition	4.00	3.50	1.0	4.00	4.00	1.50	4.50	3.50	3.25
Cauliflower	T ₁ = Farmers' practice (Application of NPK 60:40:20 kg/ha without any micronutrient)	2.00	1.50	2.50	3.00	4.00	2.00	1.00	2.00	2.25
	T ₂ = Spraying of 2 gram borax/litre of water thrice during different growth stages	4.00	4.50	2.55	4.50	4.50	4.50	4.00	3.00	3.93
	T ₃ = Spraying of 2 gram borax/litre of water + 1 gram molybdenum/litre of water thrice during different growth stages	4.00	4.50	2.60	4.00	4.50	1.0	4.50	4.50	3.70
Cauliflower	T ₁ = Farmers practice (application of NPK without any micronutrient)	3.00	2.50	1.50	2.50	3.00	1.50	1.00	3.00	2.25
	T ₂ = Soil application of 8 kg borax + 1.5 kg molybdenum/ha during land preparation	4.50	4.50	1.50	4.00	4.00	1.50	4.00	3.50	3.44
Cpasicum	T ₁ = Farmers practice (use of traditional varieties)	2.50	3.00	1.00	2.50	1.00	1.00	1.00	3.00	1.89
	T ₂ = Improved variety (california wonder) under farmers management	4.50	4.00	1.00	4.00	4.50	1.00	4.50	3.50	3.38

Overall score reflecting the degree of favourable, neutral and unfavourable reaction to the related technology interventions (Negative <2.5, Neutral = 2.6 to 3.5, Positive > 3).

Table 6: Response of farmers towards overall suitability of treatments under various on-farm trials conducted for technology refinement under small production systems

S.No.	Name of Technology	Treatment	Overall suitability	Rank
1.	Wilt resistant variety of Tomato (Arka Alok & Arka Abha)	T ₁ = Farmers practice (Use of wilt susceptible variety punjab keshri, punjab chora)	XX	III
		T ₂ = Wilt resistant variety (Arka alok under farmers management)	XXX	II
		T ₃ = Wilt resistant variety (Arka abha under farmer management)	XXXX	I
2.	Wilt resistant variety of brinjal (Swarnashree & Swarnmani)	T ₁ = Farmers' practice (use of traditional varieties)	XX	III
		T ₂ = Wilt resistant (variety Swarnshree) under farmers management condition	XXXX	I
		T ₃ = Wilt resistant variety (Swarnmani) under farmers management	XXX	II

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Table 5 further shows that the intervention related to soil treatment for wilt management in tomato i.e. soil application of 6 kg bleaching powder + 12 kg lindane dust/ha before 15 days of transplanting farmers' reactions were positive in respect of socio-cultural compatibility, compatibility with farming system components, divisibility of technology, simplicity, compatibility with internal resources of households and visibility of the technology. Easy availability of bleaching powder and lindane dust in local markets and element of risk involved were rated negative by the respondents.

In respect of wilt resistant varieties of brinjal, Table 5 further shows that Swarnshree and Swarnmani were rated positive in all respects excepting divisibility and easy availability of related inputs in local market. When overall reaction of the respondents was taken into account, the findings revealed that all the technology interventions were found to be positive in terms of the selected attributes except their easy availability in the local markets. Matrix ranking of different treatments under on farm trails conducted in small production systems was done to seek the farmers' response on refined technology. Matrix scoring technique of PRA was employed for eliciting the farmers' preference of technology interventions. The results have been depicted in Table 6.

Table 6 shows that wilt resistant variety of tomato (Arka Abha) under farmers' management condition was

most preferred choice of the farmers. In respect of the technology related to wilt resistant varieties of brinjal under farmers' management condition, the most preferred choice was wilt resistant variety (Swarnshree). The findings presented in preceding paragraphs lead to conclude that majority of the farmers were reported to be not able to accept the recommended technologies and preferred the refined technologies, as the refinements were made keeping in view the agro-ecological situations and socio-economic conditions of the farmers.

CONCLUSION

The Finding revealed that the farmers felt difficulties in adaption of recommended technologies as such in most of the intervend technologies and preferred the refined technologies which were suitable in their farming systems as well as socio-economic condition and bio physical situation.

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Socio-economic Impact of Mitraniketan; A Social Enterprise on Agricultural and Rural Development in Kerala

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ABSTRACT

The study was conducted in Thiruvananthapuram district of Kerala state where Mitraniketan is located to measure the socio-economic impact of Mitraniketan's efforts on agricultural and rural development. For the measurement purpose an index was developed by combining the weighted scores on 10 impact indicators. The focus was on four components: impact on people's participation, impact on capacity building, economic impact, and socio-political impact. In total there were 10 sub-components that dealt with aspects of impact of Mitraniketan on agricultural and rural development. The results revealed that the impact of Mitraniketan was very high on the lives of the beneficiaries as it encompassed holistic development touching all aspects of the lives of different client groups in the village: farmers, women, youth, and children.

Keywords: Social impact, Economic impact

INTRODUCTION

Mitraniketan was founded by PadmaShri K. Viswanathan in 1956. *Mitraniketan* is well known in India and abroad as a Kerala based voluntary NGO that has pioneered people-centered holistic rural development for improving the quality of life and living of village communities. Vision of *Mitraniketan* is to evolve an alternative development paradigm with a focus on sustainable rural development. Its mission is "Progress of society through the total development of individual".

Mitraniketan means 'abode of friends', and indeed has a resident community living in serene compound of a small ashram type natural surroundings and engaged in variety of creative, development activities. It has an activity pattern that is experimental and innovative. It is an education based community which imparts community based education through participatory teaching-learning methods and emphasizes the dignity of labour. It promotes sustainable agriculture and farming practices that are environmental and farmer friendly. It seeks to blend tradition with modernity and indigenous knowledge system with other knowledge systems.

The mission of *Mitraniketan* was stated to achieve progress of society through the total development of

individual, which is quite akin to the goals of extension education whose mission is 'destination man', where the focus is on enabling individual's capabilities with a strong faith in people and their capabilities. The subject of research here was to understand the way *Mitraniketan* is achieving its goal of holistic development through people's participation and challenges it is facing in the process of social change.

So social change is the prime goal that was envisaged by many social reformers. They aimed at changing the society through social work. Earlier social workers had a vision of their own and relentlessly pursued social change through personal sacrifice, zeal, social awakening, voluntarism, and social work at grassroots level. But over the years, while attempting up scaling of their social work, they experienced financial crunch and felt charity alone being insufficient. Moved by the genuine interest and good work of these social work organizations some donor agencies started 'financing philanthropy' on a project basis, but demanded better management of funds. To meet these new challenges, social work organizations too have started running their organizations in a business-like manner with application of advanced management tools and techniques. Young enthusiasts with adequate technical background and a motive for social service had entered

into social work and they brought in professionalism in social work. Thus social work has become more organized and assumed the level of entrepreneurship, but with enhancing social value and social transformation.

Social change, social entrepreneurship and its various methodological issues are nebulous and continuously evolving. Social transformation has been bestowed with many practitioners in highly varying hues, eagerness and actions. While some social entrepreneurs emphasize on 'direct action' and take head on tackling a social issue at grassroots level, some others put their efforts in social service and social work and yet some others engage themselves in social activism, in 'indirect action' by way of campaigns and advocacy. All these social agents can be termed social entrepreneurs, as they all aim for value in the form of large-scale transformational benefit that accrues to society. *Mitraniketan* has also evolved over the last five decades and requires a thorough analytical look into the various issues of social entrepreneurship

A social entrepreneur creates value in terms of socio-economic empowerment of disadvantaged people. According to Emerson and Twersky (1996) social entrepreneurship is combining commercial enterprises with social impacts. In this perspective entrepreneurs have used business skills and knowledge to create enterprises. Social entrepreneurship at its best produces small changes in the short term that reverberate through existing systems to catalyze large changes in the longer term (Ashoka Foundation, 2000).

Swaminathan (2006) wrote about the socio-economic impact of *Mitraniketan* as "it has become the flagship of our development education movement. Under the inspiring and visionary leadership of shri K.Viswanathan, *Mitraniketan* has grown into an outstanding capacity building and monitoring centre in the area of generation of sustainable livelihood opportunities. The greatest challenge before our country is to identify development pathways which can bring about a paradigm shift from unskilled to skilled work in rural India. This will call for a pro-nature, pro-poor, pro-women orientation to job led economic growth. This is where *Mitraniketan* stands as a bright affirming flame in the midst of sea of despair we see around us".

Martin and Roger (2007) reported that social entrepreneurship is as vital to the progress of societies as is entrepreneurship to the progress of economies and

it merit more rigorous, serious attention than it has attracted so far.

MATERIALS AND METHODS

Mitraniketan had brought about major changes in the lives of the community. The extent of impact was measured through an index developed specially for the study. It consisted of ten indicators of improvements and changes that have occurred due to interventions of the *Mitraniketan*. These indicators can be seen in Table 1.

The operational definitions and measurement procedure of all indicators is given here.

A. Impact on People's Participation in *Mitraniketan*: This is measured through four sub-components: duration of contact with *Mitraniketan*, participation in and voluntary contribution to *Mitraniketan*, empowerment of women through *Mahilasamajam*, and reaching the unreached through Rural Extension Sub-Centre. It has been envisaged that people's participation is the most crucial impact indicator of people-centric holistic development goal of *Mitraniketan*. Hence, the component of impact of *Mitraniketan* on people's participation was taken as the first component for assessing impact of *Mitraniketan* on people's lives.

1. Duration of Contact with *Mitraniketan*: This is operationalized as the number of years of contact that the respondent had with *Mitraniketan*. It is assumed that the association with the *Mitraniketan* may grow stronger as the years of contact pass by.

2. Participation in and Voluntary Contribution to *Mitraniketan*: Since *Mitraniketan* promotes voluntarism for agricultural and rural development, voluntary participation and voluntary contribution by the beneficiaries of *Mitraniketan* was taken as the impact indicator. It is operationalized as the kind of voluntary contribution in terms of participation, getting actively associated, joining *Mitraniketan's* field extension work as a community resource person and becoming a partner in the social entrepreneurial activities of *Mitraniketan*.

3. Empowerment of Women through *Mahilasamajam*: Women were important client group for the social enterprise. So, special programmes were run for women by *Mitraniketan* through *Mahilasamajam*. Impact of women can be a good impact indicator of *Mitraniketan's* efforts. It is operationalized as the degree of empowerment of women as a result of *Mahilasamajam's* efforts.

Table 1: Indicators of Impact of *Mitraniketan* on agricultural and rural development

No.	Impact Indicators	Weighted Score
A	Impact on People's Participation	40
1.	Duration of contact with <i>Mitraniketan</i>	10
2.	Participation in and voluntary contribution to <i>Mitraniketan</i>	10
3.	Empowerment of women through <i>Mabilasamajam</i>	10
4.	Reaching the unreached through Rural Extension Sub-Centre	10
B	Impact on capacity building	10
5.	Development education for life through skill training	10
C	Economic impact	20
6.	Benefits accrued through adoption of technological innovations	10
7.	Household food and nutrition security ensured through <i>Mitraniketan's</i> efforts	10
D	Socio- political impact	30
8.	Satisfaction with <i>Mitraniketan's</i> efforts	10
9.	<i>Mitraniketan's</i> visibility enhanced through educational tourism	10
10.	Impact on leadership and local governance	10
	Total score	100

4. Reaching the Unreached through RESC: The innovative approach of Rural Extension Sub-Centre (RESC) was the flagship innovation of *Mitraniketan* that has won many awards and accolades for *Mitraniketan*. It is operationalized in terms of progress and spread of RESC in the districts.

B. Impact on Capacity Building: *Mitraniketan* has identified that skilled labour and technical hands were always scarce and in great demand. Hence they have taken up several training courses for youth in order that human resources get enriched and provide the society with technically skilled people. Hence, capacity building, motivation and training of technical skills through its approach of 'Development Education for Life' was considered as an important impact component. The *Mitraniketan* People's College, Rural Technology Centre, Core Support Group of DST, KVK and *Mitraniketan* Schools have all imbibed this philosophy of capacity building for life skills in their curriculum and various training courses. Only one sub-component was considered here for measuring impact of *Mitraniketan*.

5. Development Education for Life through Skill Training: Education for life skills (rather than for degrees and diplomas) has been the primary goal of *Mitraniketan*. So Shri Viswanathan has started free schools and technical schools (including MPC, RTC) for preparing for basic life skills rather than acquiring mere academic knowledge. This is one of the most important activities that have impacted two or three generations of tribal people in and around Vellnad region of south Kerala. It has been operationalized as

the degree of acceptance of development education as a major tool for acquiring life skills and preparing for life.

C. Economic Impact: This component is considered important for assessing impact of *Mitraniketan* because it is going to impact the economic security of people. Benefits accrued through adoption of technologies promoted by *Mitraniketan* KVK and Core Support Group of DST and ensuring household food and nutrition security through *Mitraniketan's* efforts were the two sub-components considered as impact indicators.

6. Benefits Accrued Through Adoption of Technological Innovations: Promotion of adoption and diffusion of technological innovations was a prime activity of *Mitraniketan*. Benefits accrued through adoption of technological innovations is an important impact indicator. It is operationalized as the type of benefit in terms of inputs, training, benefits in terms of moderate change in production, heavy reduction in cost of cultivation, enhanced production and increase in real income and starting RESC.

7. Household Food and Nutrition Security Ensured Through *Mitraniketan's* Effort: Ensuring food and nutrition security at household can be taken as useful impact indicator as it directly influences the family. It is operationalized as the extent to which food security is ensured at household level.

D. Socio-political Impact: Social impact and political impact were other parameters of *Mitraniketan's* impact assessment. Satisfaction in the *Mitraniketan's* efforts,

impact through educational tourism and impact through leadership and local governance were the three impact indicators considered for measurement of impact of *Mitraniketan*.

8. Satisfaction in the Mitraniketan's Effort:

Perceived satisfaction among the clients of *Mitraniketan* can be useful impact indicator. This is operationalized as the degree of satisfaction and positive feelings expressed by respondents towards *Mitraniketan's* efforts for agricultural and rural development.

9. Mitraniketan's Visibility Enhanced Through Educational Tourism:

Mitraniketan attracts many students from Denmark and other European nations as tourists visiting Mitraniketan, as this is a model of Danish Folk High Schools. The concept of community living as part of a *Gurukul* tradition was appreciated by foreign visitors. This brings in dollars (as foreign exchange) as visiting fees and donations for philanthropic (no market) units of *Mitraniketan*. In addition interested foreign students take up case studies of *Mitraniketan's* success stories thereby enhancing the visibility of *Mitraniketan*. This impact is operationalized as the level of interaction the student visitors have with *Mitraniketan* and support they provide and the kind of international recognition that *Mitraniketan* gets.

10. Impact Through Leadership and Local Governance:

Mitraniketan teaches and trains children, adolescents and adults for life skills. Some of the students of *Mitraniketan* have achieved leadership in their communities after passing out from *Mitraniketan*. This impact was operationalized as the degree of participation of trained students of *Mitraniketan* in political and social life of their village communities and even working for better local governance of Village Panchayats.

Impact Index: After measuring all the constituent sub-components, an attempt has been made to add up all the obtained scores on all the ten sub-components to get a composite score of impact index. The total obtained scores were expressed as percent of the total obtainable score of 100.

RESULTS AND DISCUSSION

Impact index score was computed as percent of obtained score over obtainable score. The results of analysis of impact index are presented in Table 2.

As can be seen from the results, mean impact index

score was 65.13 indicating that majority of respondents had high impact scores. The impact index scores among the ten different indicators/parameters ranged from 46 to 85 indicating wide variation of impact on various indicators.

Impact on People's Participation: Among the four indicators in this set, maximum scores were obtained on 'empowering women through *Mabilasamajam*', impact on reaching the unreached through RESC' and 'participation in and voluntary contribution to *Mitraniketan*. Indeed these three components have impacted the agricultural and rural development with greater participation of people in the programmes and activities of *Mitraniketan*. In all these three activities, the cost-sharing extension approach was adopted.

Impact on Capacity Building: Among the capacity building activities of Mitraniketan, the 'Development education for life through skill training' had created major impact. Indeed education for life on experimental lines has yielded desired results and impacted not only the students and their parents; it had left an indelible mark on the lives of them to continue for two more generations. The experiential ways adopted in teaching were appreciated by all. In the same manner, the capacity building activities including skill training in various vocations for MPC students, paravet professionals and young men and women had impacted their skill upgradation, knowledge enrichment and resulted in enhanced self-worth and self-esteem among the trainees and young students. Entrepreneurial opportunities have also increased over the years giving a wide choice for students to choose from.

Economic Impact: Among the two impact components, household food and nutritional security was ensured in majority of the houses, saving them and their families from poverty and malnutrition. Technology diffusion by *Mitraniketan* and adoption has also resulted in accruing of benefits in terms of enhanced crop yields, saving in costs and improved living standards.

Socio-political Impact: Among the three impact indicators, 'people's satisfaction with *Mitraniketan's* efforts', and '*Mitraniketan's* visibility enhanced through educational tourism' have impacted in good measure. People in general expressed satisfaction and positive feelings towards *Mitraniketan* and contributed voluntarily to *Mitraniketan* in terms of giving their time, labour, donations, etc., and actively got associated with

Table 2: Socio-economic Impact of *Mitraniketan* (N=80)

No.	Socio-economic Impact of <i>Mitraniketan</i>	Mean Index Score
A	Impact on People's Participation	
1.	Duration of contact with <i>Mitraniketan</i>	56.00
2.	Participation in and voluntary contribution to <i>Mitraniketan</i>	62.00
3.	Empowerment of women through <i>Mabilasamajam</i>	76.00
4.	Reaching the unreached through Rural Extension Sub-Centre	68.00
B	Impact on capacity building	
5.	Development education for life through skill training	74.00
C	Economic impact	
9.	Benefits accrued through adoption of technological innovations	63.00
10.	Household food and nutrition security ensured through <i>Mitraniketan's</i> efforts	61.00
D	Socio- political impact	
12.	Satisfaction with <i>Mitraniketan's</i> efforts	85.00
14.	<i>Mitraniketan's</i> visibility enhanced through educational tourism	78.00
15.	Impact on leadership and local governance	46.00
	Mean Impact Index score	65.13

Mitraniketan's programmes and activities. Another major impact that can be seen recently was: participation of *Mitraniketan* graduates in Panchayat and local governance, which can be seen as a good omen for all as young people take leadership role and help promote the values cherished by *Mitraniketan* in the society. Thus these values were found to take roots in local governance for better social welfare among people of South Kerala.

CONCLUSION

Thus it can be concluded that the socio-economic impact of *Mitraniketan* was very high and the major impact causing issues were: *Mitraniketan's* innovative extension strategies of rural extension sub centres, educational innovations in terms of *Mitraniketan* People's College, Rural Technology Centre and Krishi Vigyan Kendra in teaching and training all categories of clientele and providing them with ample opportunities to explore and improve their lives and livelihoods. The results revealed that the impact of

Mitraniketan was very high on the lives of the beneficiaries as it encompassed people-centric holistic development touching all aspects of the lives of different client groups in the village: farmers, women, youth, and children.

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Extent of Adoption and Perceived Reasons for Organic Cardamom Production in Idukki District of Kerala

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ABSTRACT

Organic agriculture in developing countries is becoming a tool for socio-economic development and is supported by various international and national development initiatives. In India spices being major contributors to national income, are gaining attentions regarding the organic farming practices. Present study conducted in Idukki district of Kerala was aimed to identify the extent of adoption of various recommended practices and reasons for adopting organic cultivation practices of cardamom. Data were collected from 120 respondents, comprising 90 organic and 30 inorganic cardamom farmers' which were selected through multistage sampling procedure. The results of the study on different aspects of extent of adoption in case of organic and inorganic farmers clearly showed that most of the practicing farmers were innovative in the complete adoption of the relevant technologies. Organic cardamom growers were found to be more innovative in the adoption of practices like planting material selection, the water and soil conservation technologies, and plant protection measures contributing higher benefit for the overall improvement of their farmland and the income generating capacity of farmers. The apprehension for the pollution free environment, chemical free produce, and increased demand for the organic cardamom in the international and the domestic markets horde farmers briskly to adopt organic farming practices in cardamom.

Key words: Organic cardamom, Extent of adoption, Reasons of organic cultivation

INTRODUCTION

Agriculture has been the anchor for achieving socio-economic augmentation in India. The Green Revolution is one of the triumph stories that ushered in an era of food self-reliance and rural prosperity. Even though it is having the bright faces of improvement in terms of yield and productivity, adverse effects of modern technologies are also seen not only on the farm but also on the health of all living things and on the environment. Their off-putting effects on the environment are manifested through soil erosion, salination, genetic erosion etc. Application of technology, in terms of the use of chemicals fertilizers and pesticides contributed to the imbalanced environment has persuaded farmers to think aloud. India with more than sixteen percent of world population, the greatest challenge that the nation is going to face in the coming years will be *to provide safe food for its growing population*. In this regard, organic farming, a holistic production management system for

promoting and enhancing health of agro-ecosystem, has gained wide recognition as a valid alternative to conventional food production system to ensure safe food for human consumption (Bhattacharya and Krishna, 2003). Organic agriculture is swiftly mounting in all parts of the world. From 2000 to 2009, the organically managed land area increased from nearly 15 million hectares to 37 million hectares, of which nearly one third was positioned in developing countries (Willer, 2011). The escalation of the organic land area in developing countries was mainly based on increasing exports of organic food to developed countries (Parrott *et al.*, 2006). In a state like Kerala, where cash crops are being exported to other nations and contributing a major portion to the national income, organic production of the spices is very much sensational. Cardamom, '*The Queen of Spices*', is now enjoying the status of organic spice in the state. A number of factors are associated with the adoption of organic cultivation practices among the cardamom farming community. However, the intensification rates of organic production

depend on diverse factors and show a discrepancy from country to country and from region to region (Brodt and Schug, 2008). Cardamom farmers were following the recommended package of practices of organic farming in exact and modified form suited for their farming system, without compromising the quality standards for marketing. Considering all these facts, this study was planned to analyze extent of adoption of package of cultivation practices followed invariably by the organic and inorganic cardamom farmers with special emphasis on reasons for adopting organic cultivation practices for the sustainable development of the farming system.

MATERIALS AND METHODS

The study was conducted in purposively chosen Idukki district of Kerala state as demanding spice cultivations especially, organic cardamom production and certification are taken up by many agencies in the area and it is known as spice bowl of Kerala. An exploratory research design was adopted for the present study. A multi stage sampling procedure was used. Out of the eight block of Idukki district, three blocks namely, Udumbanchola, Devikulam and Peermadu were selected purposively, since these are the blocks mainly growing organic cardamom. A survey approach with semi structured interview schedule was used to study the extent of adoption. Ninety farmers (thirty from each selected village) who were actively involved in organic cardamom farming and thirty farmers (ten from each selected village) following inorganic cardamom cultivation were selected from three blocks of Idukki district and that formed a random sample of one hundred and twenty respondents.

Extent of adoption of the package of practices of each technology was measured using a five point continuum which had points ranging from no adoption to modified and adopted. Frequency of different adoption categories was worked out using the frequency analysis. Major reasons for the organic cultivation of the cardamom were identified by giving rank to the selected statements. For the identification of the reasons for organic cultivation, statements were framed for organic farmers only. The respondents were asked to rank these selected eight statements regarding factors of espousal of organic cultivation, while adopting the cultivation practices and organic farming based on their view point as well as from their experience of cardamom cultivation. Those statements based on the ranks, were

analysed based on Friedman's test. Based on the mean ranks of the Friedman's test they were grouped using the multiple comparison technique

RESULTS AND DISCUSSION

The results of the investigation are presented in two parts; the extent of adoption and reasons for organic farming. Extent of adoption has been divided under three sections for the purpose of presentation and the motives for organic production along with test statistics make second part. The results is discussed as follows:

In technological and methodological innovations adoption category for the planting material selection showed in Table 1 indicate that 73.3 per cent of farmers fully adopted the organic farming practices as per the package of practices. In case of inorganic farmers, frequency for the full adoption category was less (56.7 per cent) as compared to organic farmers in planting material selection 43.3 percent of the inorganic farmers fall in the partial adoption category as compared against the 13.3 per cent of organic cardamom farmers. Only 37.8 per cent of organic cardamom growers were under full adoption of local selection varieties. But in the case of inorganic cardamom growers full adoption was for the improved varieties in full adoption. Some of the organic cardamom growers were making some modifications in all selecting the planting material. Whereas such modifications were absent in the case of the inorganic cardamom growers. Earlier farmers were followed the seedling method of planting in cardamom plantations. Due to the high infestation of wilt in the seedlings, low germination percentage of seeds and greater period for transplanting the plants from nursery to the field, shift in the propagation method of cardamom from seedling to sucker method was observed both by organic and inorganic cultivators.

From Table 2 it is clear that the full adoption of the field planting technologies like land preparation, spacing, pit preparation, pit size and planting in pit, as per the package of practices by both organic and inorganic cardamom farmers was recorded where as adoption of the weed management widely varied. Partial adoption was followed in case of time and number of weeding. In case of type of weeding, majority (70.0 per cent for organic and 73.3 per cent for inorganic) were fully adopting the package of practices. Earthing up and threshing were reported as important cultural practices followed in the cardamom plantations. Method of threshing was fully adopted (100 per cent) by the

Table 1: Extent of adoption of technological decision making, regarding cardamom cultivation up to planting

No	Technology	Noadoption		Partialadoption		Fulladoption		Modified adoption	
		ORG	INORG	ORG	INORG	ORG	INORG	ORG	INORG
		(90)	(30)	(90)	(30)	(90)	(30)	(90)	(30)
I	Selection of planting materials	0(0)	0(0)	12(13.3)	13(43.3)	66(73.3)	17(56.7)	12(13.3)	0(0)
a	Improved variety	68(75.6)	18(60.0)	1(1.1)	4(13.3)	16(17.8)	8(26.7)	5(5.6)	0(0)
b	Local selection	43(47.8)	14(46.7)	8(8.9)	9(30.0)	34(37.8)	7(23.3)	5(5.6)	0(0)
c	Farmers selection	69(76.7)	28(93.3)	3(3.3)	0(0)	16(17.8)	2(6.7)	2(2.2)	0(0)
II	Propagation methods	0(0)	0(0)	1(1.1)	0(0)	89(98.9)	30(100.0)	0(0)	0(0)
a	Seedlings	90(100)	30(100)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
b	Suckers	0(0)	0(0)	1(1.1)	0(0)	89(98.9)	30(100)	0(0)	0(0)

ORG=Number of organic farmers; INORG= Number of inorganic farmers: Values in parenthesis indicate percentage

Table 2: Extent of adoption of technologies from planting to harvest of cardamom

No	Technology	Noadoption		Partialadoption		Fulladoption		Modified adoption	
		ORG	INORG	ORG	INORG	ORG	INORG	ORG	INORG
I	Planting in field	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
a	Land preparation	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
b	Spacing	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
c	Pit size	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
d	Pit preparation	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
e	Planting time	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
II	Weed management	27(30)	8(26.7)	20(22.2)	7(23.3)	20(22.2)	7(23.3)	23(25.6)	8(26.7)
a	No of weeding	0(0)	0(0)	67(74.4)	22(73.3)	23(25.6)	8(26.7)	0(0)	0(0)
b	Time of weeding	0(0)	0(0)	47(52.2)	15(50.0)	43(47.8)	15(50.0)	0(0)	0(0)
c	Type of weeding	0(0)	0(0)	27(30.0)	8(26.7)	63(70.0)	22(73.3)	0(0)	0(0)
III	Trashing	0(0)	0(0)	0(0)	0(0)	4(4.4)	10(33.3)	86(95.6)	20(66.7)
a	Method	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
b	Time	0(0)	0(0)	44.4	10(33.3)	86(95.6)	20(66.7)	0(0)	0(0)
IV	Earthing up	0(0)	4(13.3)	0(0)	2(6.7)	15(16.7)	9(30.0)	75(83.3)	15(50.0)
a	Method	0(0)	4(13.3)	0(0)	2(6.7)	90(100)	24(80.0)	0(0)	0(0)
b	Time	0(0)	4(13.3)	15(16.7)	11(36.7)	75(83.3)	15(50.0)	0(0)	0(0)
V	Irrigation management	0(0)	0(0)	8(8.9)	2(6.7)	14(15.6)	4(13.3)	68(68)	24(80.0)
a	Irrigation time	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
b	Mulching	8(8.9)	2(6.7)	14(15.6)	4(13.3)	68(75.6)	24(80.0)	0(0)	0(0)
VI	Soil and water conservation technology	8(8.9)	1(3.3)	25(27.8)	14(46.7)	36(40.0)	8(26.7)	21(23.3)	0(0)
a	Water harvesting	48(53.3)	9(30.0)	32(35.6)	13(43.3)	10(11.1)	8(26.7)	0(0)	0(0)
b	Bunding	0(0)	1(3.3)	13(14.4)	6(20.0)	43(47.8)	23(76.7)	34(37.8)	0(0)
VII	Manuring	2(2.2)	0(0)	4(4.4)	1(3.3)	46(51.1)	7(23.3)	38(42.2)	22(73.3)
a	Time	2(2.2)	0(0)	19(21.1)	6(20.0)	69(76.7)	24(80.0)	0(0)	0(0)
b	Dose	2(2.2)	0(0)	35(38.9)	3(10.0)	53(58.9)	27(90.0)	0(0)	0(0)
VIII	Shade regulation	0(0)	3(10.0)	22(24.4)	7(7)	68(75.6)	20(66.7)	0(0)	0(0)
IX	Bee keeping	0(0)	20(66.7)	34(37.8)	10(33.3)	34(37.8)	0(0)	56(62.2)	0(0)
a	No of colonies	0(0)	20(66.7)	5(5.6)	10(33.3)	85(94.4)	0(0)	0(0)	0(0)
b	Maintenance	6(6.7)	30(100)	26(28.9)	0(0)	58(64.4)	0(0)	0(0)	0(0)
X	Plant protection	0(0)	0(0)	0(0)	9(30.0)	90(100)	21(70.0)	0	0

ORG=Number of organic farmers; INORG= Number of inorganic farmers, Values in parenthesis indicate percentage

cardamom farmers. For irrigation practices organic cardamom farmers showed much variation. It varied from no adoption to complete adoption in use of mulching. Partial adoption category also contributed a minor portion (15.6 per cent). In soil and water conservation practices, much more modifications were found among the organic cardamom growers (23.3 per cent). Majority of the cardamom growers followed the recommendations as such. Manuring and shade regulation practices were adopted for the healthy growth of the cardamom plants. Shade trees were properly pruned and maintained during the entire cropping year without much deviation from full adopted category. Bee keeping was widely adopted by the organic cardamom farmers as a facilitating agent for pollination in the cardamom. It is evident from the Table 2 that inorganic cultivation was not suitable for bee keeping practices. Even if one may try to do so, poisoning of the colonies would happen and they would not be able to maintain bee colonies. Plant protection measures were also followed as per the recommendations. They were trying to incorporate new varieties which were tolerant to pest and diseases by local selection.

As depicted in Table 3, harvesting and post harvesting operations were adopted by the organic and inorganic cardamom farmers fully or partially. About 63.30 per cent of the organic and 83.3 per cent of inorganic cardamom farmers in the selected samples followed the partial adoption of the harvesting and post harvest operations as per the package. Full adoption of the practices was followed by a small portion of the cardamom farmers in both, organic (33 per cent) and inorganic (5 per cent) cardamom farmers. There was no

deviation in the time of harvest. Harvesting was started at the maturity stage of the cardamom berries indicated by the colour change in the lower portion of the spikes. By analyzing the Table 3 it is clear that the deviation from the actual packages were found only in the packing of berries before marketing. All other practices like washing, cleaning, polishing, drying, sorting and grading were followed as per the recommendation. Both the categories of farmers completely adopting whatever the package of practices recommended for these. However, results showed that farmers were ignoring the packing practices and majority of organic cardamom farmers (63.3 per cent) and inorganic cardamom farmers (83.3 per cent) were not adopting any packaging in cardamom after harvest, which is essential for the good marketability of the produce. About 36.7 per cent of organic and 16.7 per cent of inorganic cardamom farmers were partially adopting the packing in cardamom before marketing.

The results of the study on different aspects of extent of adoption in case of organic and inorganic farmers clearly showed that most of the practicing farmers were innovative in the complete adoption of all the relevant technologies as per the package of practices. Almost all the agricultural lands suffered highly due to the ill effects of intensive agriculture like salination of aquifers, polluted/degraded soil, air and water quality and loss of diversity of beneficial biota and declined production (Babou *et al.*, 2009). In order to overcome these, some innovative farmers diverted into their traditional sustainable organic farming techniques (Bockstaller *et al.*, 1997). This was true in case of organic cardamom farmers. They were fully adopting many of

Table 3: Extent of adoption of Technologies in Harvesting and post harvest operations of cardamom

No	Technology	No adoption		Partial adoption		Full adoption		Modified adoption	
		ORG	INORG	ORG	INORG	ORG	INORG	ORG	INORG
I	Harvesting and processing	0(0)	0(0)	57(63.3)	25(83.3)	33(36.7)	5(16.7)	0(0)	0(0)
a	Time of harvest	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
b	Post harvest operations	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
1.	Washing	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
2.	Drying	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
3.	Cleaning	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
4.	Polishing	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
5.	Sorting	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
6.	Grading	0(0)	0(0)	0(0)	0(0)	90(100)	30(100)	0(0)	0(0)
7.	Packing	57(63.3)	25(83.3)	33(36.7)	5(16.7)	0(0)	0(0)	0(0)	0(0)

ORG=Number of organic farmers; INORG= Number of inorganic farmers, Values in parenthesis indicate percentage

the modified organic farming methods the like the farmer selection varieties, bee keeping for increasing the pollination percentage and organic plant protection methods. Maity and Tripathy (2004) stated that adoption of pure organic farming is possible, more specifically in crops having high export potential in international markets. Cardamom is a spice crop with high export potential. Cultivating it in the forest keep the forest biomass protected and uncontaminated from adversely affecting chemicals which were used in the plant protection and weed control. Even though spices are showing greater response to the organic cultivation, perennial nature and habitat act as a hindering factor in doing the research about the organic practices in spices, especially in cardamom. Some of the farmers were found not so innovative. This might be due to the lack of sufficient resources to meet the complete requirement of the farm. According to Schneeberger *et al.* (2002), technical challenges and additional labour requirements are vital barriers to complete adoption of organic farming practices by the farmers. Even if, results of this study showed that organic cardamom growers were more innovative in the adoption of practices like planting material selection based on the farmer selection and local selection, the water and soil conservation technologies, and different way of plant protection measures contributed more benefit to the overall improvement of their farmland and the income generating capacity of the farmers. Crosson and Ostrov (1990) argue that organic farmers need to be intimately familiar with ecological relationships in order to manage crop and livestock production without utilizing synthetic fertilizers and pesticides. This study shows agreement with the present study; nearly 50 per cent lack in adoption of packing, due to the unavailability

of technologies in right places and need of additional labour for the careful packing for increased marketability.

Friedman's nonparametric test was used to identify the significance of differences among the various reasons for adopting organic cultivation. The result was found to be significant and is given in Table 4.

Table 4: Test statistics of Friedman's test

Friedman's test	
Q (Observed value)	345.340
Q (Critical value)	14.067
DF	7
p-value (Two-tailed)	< 0.0001

It was further subjected to multiple comparison procedures to identify homogeneous groups of reasons. Since farmers were asked to give rank in decreasing order (from most preferred to least preferred) for organic cardamom cultivation, Organic farming reduces the environmental pollution gained mean rank of 2.56 which was the lowest mean rank among others and identified as most supporting reason. Mean rank for, increasing domestic market for organic produce was 3.29 and production of chemical free food had the mean rank 3.33. Followed by high price for organic produce with mean rank 3.47 as a main reason for adoption of organic cardamom cultivation. Even though these statements were with slightly different mean ranks, multiple comparisons analysis revealed that these were on par. Again the analysis results showed that reasons were grouped in to five homogenous groups. In that, financial support from government

Table 5: Major reasons for adopting organic farming (N=90)

S. No.	Reasons for adopting organic farming	Mean Rank	Homogenous Groups**				
1.	Reduces the environmental pollution	2.56	A				
2.	Increasing domestic market for organic produce	3.29	A	B			
3.	Produces chemical free food	3.33	A	B			
4.	High price of organic produce	3.47	A	B			
5.	High demand of organic produce in the export market	4.38		B	C		
6.	Enables group farming and marketing	4.75			C		
7.	Lowers the cost of cultivation	6.23				D	
8.	Financial support from government through the Kerala state organic farming policy	8.00					E

**Mean ranks having same letters are not significantly different

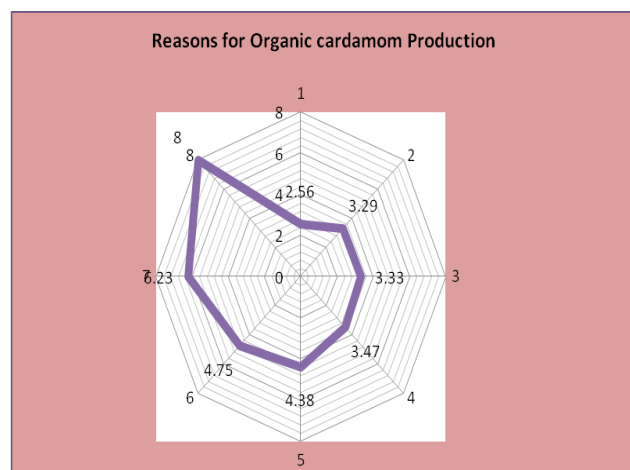


Figure 1: Reasons for organic production of cardamom based on the priority ranks given by the respondents

sided with mean rank 8.00 and lowering of cost of cultivation through organic farming with mean rank 6.23 were identified as least supporting factors in adoption of organic cardamom practices among farmers.

A study by Howlett *et al.* (2002) showed that most notable farmer motives for organic cultivation were producers' attitudes toward finances and the environment. In that study, farmers were asked about the benefits of organic farming, their most common responses were, "better prices," and, "greater income." These findings were on par with present study results. In Howlett *et al.* (2002) study government subsidies and investment considerations. But in this study farmers identified government financial support as the least important factor for adoption of organic cardamom production. The importance of regional market characteristics on farmers' motivations to convert to organic production were also echoed in study result of Midmore *et al.* (2001). According to Padel and Lampkin (1994), the replacement of external inputs by farm-derived resources normally leads to a reduction in variable input costs under organic management. Even though some of the studies showed this as true, present study showed a contradictory result about it. This was due to the need of large amount of organic manure for cardamom and farmers were not able to make it in their own homestead, so that they were depending on nearby states like Tamil Nadu and Karnataka to meet the gap. This was adding on cost of cultivation. Even if there were any added cost and slump in yield in initial period

of cultivation, better prices to organic produces would certainly compensate the loss owing to slump in yield. More ever organic farmers had better environmental orientation than inorganic farmers. The organic farmers were treating their farms as a living organism and they were mostly using locally available inputs in their farming which did not harm the environment (Jaganathan, 2009).

A number of factors were associated with the adoption of organic cultivation practices among the cardamom farming community. The increasing wakefulness about the chemical free and safe food for a better living, and the willingness of consumers to pay out more on organic cardamom have raised the demand of organic food even in the domestic markets and lured farmers to adopt organic production of cardamom. In addition, high demand for organic produce in international market was also another major aspect that lured them to shift to organic cardamom cultivation through group efforts of farming and marketing and exporting abroad.

CONCLUSION

Organic farming is the most rife technological development and innovation in the context of modern agriculture in both developed and developing countries. The principles of organic farming practices attracting the cardamom farmers due to its various advantages over the modern cultivation methods. Organic standards not only require that operators maintain and improve the quality of natural resources, but that they must also incorporate practices that implement this goal in their management plans. Compared to inorganic cardamom farmers, organic cardamom farmers were more imperative in adoption of package of practices which results in more subsistence way of cultivation. Organic cardamom cultivation does not need costly investment in any practices. It shows its impacts in all aspects of the cultivation including the nature and mind set of people, who were considering cardamom plants as their life supporting and income giving crop. It allowed the adoption of traditional and indigenous knowledge like farmer selection varieties and management practices and incorporation of biological principles and resources for intensification of cardamom production. By adopting organic cultivation, cardamom farmers are challenged to take on new knowledge and perspective and to innovate.

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Development and Assessment of a Need Based and Interactive ICT Based Self Learning Tool for Livestock Owners

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ABSTRACT

In recent years educational technology, empowered by multimedia and internet has opened a new vista for technology transfer. Multimedia enabled interactive educational systems have been able to cross the barriers of poor educational and socio-economic status for providing locale specific necessary information in various aspects. The present paper provides a detailed account of a new need based and interactive ICT based self learning tool for the livestock owners in India, the “Pashudhan avum kukkut rog suchna prawali” (PAKRSP). For development of this learning tool, information needs of livestock owners of India was assessed by analyzing the secondary data of Kisan Call Centre situated at the Indian Veterinary research Institute (one of the nodes of a national facility for providing toll free tele consultancies to livestock owners). Based on the need assessment and prioritization an ICT based self learning tool was designed using multimedia tools for the livestock owners of the country in Hindi language (Official language of India). The tool is fully equipped to cater to even the illiterate audience as it is backed with visuals, animations and voice backup. It is fully interactive and the learners have freedom to explore any part of the information provided, in any order. The field assessment of PAKRSP has also revealed that livestock owners have rated this learning tool very effective and interesting to enhance their knowledge and maintain interest. Further the study revealed that the livestock owners are ready to pay a sum of INR 50 to INR 2000 for purchasing the learning tool.

Keywords: ICT, Interactive self learning tool, Livestock owners, Need assessment, Assessment of learning tool

INTRODUCTION

Today India has achieved the status of highest milk producer in the world with 121.8 MT milk production per annum. But still we are far behind in terms of per animal productivity. As per GOI report (2009), the average milk productivity of crossbred cows, indigenous cows and buffaloes in India is only 6.44, 1.97 and 4.3 lt./day respectively. Introduction of exotic breeds in India have increased the incidence of diseases especially Foot and Mouth Disease (FMD), Haemorrhagic Septicaemia (HS), *peste-des-petits* ruminants (PPR), Brucellosis, Mastitis, Blood protozoan diseases etc. India losses 4.45 billion US dollars (Rs. 20,000 crores) per year due to the adverse effect of performance of the animals because of some diseases (*Press Information Bureau, GOI*, <http://pib.nic.in>). This situation implies that knowledge management for livestock health among the livestock owners should be the most important focal point for all livestock extension activities.

The great research efforts in our country have been able to develop new livestock technology for raising the production level of farmers but it is the strategy of technology transfer of the nation that determines the translation of scientific achievement to practice at farmers level. A recent survey by NSSO shows that only 5.1% of the households access any information on animal husbandry (NSSO, 2005). Corresponding figure for agricultural sector was 40.5%. The above situation strongly indicates that there is a need for developing suitable information systems for the livestock owners for educating them specifically about the livestock disease management which is the focal point in livestock production and has significant impacts on the economy of the livestock sector. In recent years information technology, empowered by multimedia and internet has opened a new vista for technology transfer. The multimedia capabilities of ICTs offer the potential to move beyond databases towards the presentation of

information in formats that are more appropriate and meaningful to local populations (Richardson, 1997).

MATERIAL AND METHODS

The present research was taken up with the major objective of development of a need based and highly interactive self learning tool for livestock owners and assessment of its perceived utility among the end users. The study was conducted in three steps. Firstly for assessment and prioritization of the information needs of the livestock owners four years data of the Kisan Call centre, at Indian Veterinary Research Institute, Izatnagar from the year 2004 to December 2007 was collected, analysed and prioritized. Secondly, based on the prioritized need an interactive self learning tool was developed for the farmers and professionals. Thirdly, the field assessment of the learning tool was done by screening it at various places such as at the institute level to randomly selected groups of the visiting farmers and trainees. Further it was shown at randomly selected villages around the institute and at the farmers fairs at various institutes. Around 1600 livestock owners (farmers, entrepreneurs) have seen the Learning tool (PAKRSP). The data was collected from them using structured interview schedule. Data was screened and a total of 1570 interview schedule of livestock owners were analyzed for their opinion on the effectiveness of the learning tool in transmitting the information to the target audience and also their willingness to purchase it.

RESULTS AND DISCUSSION

The development of the learning tool mainly included three steps: i) Identification and prioritization of information needs of livestock owners, ii) development of learning tool by collection of scientific information from reliable sources, storage, processing, classification, and display of the information using multimedia tools and iii) assessment of the learning tool in the field among the livestock owners.

Kisan Call centers (KCC) have been established all over the India to deliver knowledge and information to the farmers exactly as per their requirements that too free of cost. Four years data of the Kisan Call centre, situated at Indian veterinary research Institute (IVRI) was analysed to gather the type of information sought by the livestock owners/farmers especially with regards to livestock health and production, as this centre is the level II node for veterinary related queries. A total of

3763 queries were asked from the level II node of Kisan Call Centre situated at IVRI from the two states of Uttar Pradesh and Uttarakhand. Majority of the information sought by the livestock owners was related to buffalo (45.09%) followed by cattle (39.04%), goat (3.50%), poultry (3.22%), pig (2.37%), dog (2.13%), dairy farming (1.03%), fish (0.58%), horse (0.39%), bee keeping (0.35%), sheep (0.19%), rabbit (0.18%) and miscellaneous subjects (0.64%). Further the results reveal that with regards to cattle and buffaloes majority of the farmers asked the health related queries followed by reproduction and breeding related queries. The overall trend of the queries during the period 2004-2007 revealed that more than 60 per cent of the calls were on health/ diseases followed by reproduction/breeding (21.58%), production, management and nutrition (9.02%) and trainings/extension (8.83%) (Tiwarei *et al.*, 2010).

As per the information needs of livestock owners a learning tool has been developed in two languages i.e., Hindi (official language of India) and English (International Language) which encompasses 78 disease of livestock (Cattle, Buffalo, Sheep, Goat, Pig, Horse) and poultry and nine common package of practices for sustainable livestock and poultry production. The English Version of the learning tool is entitled "Livestock and Poultry Disease Information System" (LPDIS) and the Hindi Version is entitled "Pashudhanavum Kukkut Rog Suchna Pranali" (PAKRSP). The learning tool is a comprehensive package containing information about all the infectious, non infectious, metabolic, parasitic, and fungal diseases of major livestock species i.e., Cattle, Buffalo, Sheep, Goat, Pig, Horses and Poultry.

The developed learning tool is a rich internet application and platform which is independent and compatible to all operating systems such as, Windows-98, Microsoft XP- 2000, 2003, Windows- Vista and Linux. The system has been developed on Adobe creative suite 3.0 and designed using Adobe Flash and language used is html and action script 2.0.

All the information is given in the form of text in both languages (Hindi and English) and supported by the voice backup, photographs and animations so the illiterate farmers can understand easily. The language chosen for the software was Hindi since apart from being the official language for the country, it is also the widely spoken language in the country and is spoken

in the Northern and Central India covering as many as nine states of the country. In fact other researchers have also reported that content in local languages is imperative for information delivery when the population in the far-flung areas is not really conversant with English and having a low literacy rate (Bhattacharjee, 2002).

The major feature of this learning tool is its highly appealing presentation along with audio backup which helps in inculcating greater understanding of the diseases among the end users. As soon as the self learning tool “PAKRSP” is installed on the computer and is clicked, it takes the user to the First page the title page of the tool which gives information about the PAKRSP and about the institute. To move further in the tool one has to enter the password in the space given. Once it is entered the user reaches to the inner title page of the tool. Here all the diseases of livestock are grouped into various categories, according to the most common diseases of a group of animals and for poultry disease there is separate category. A click on the selected group of animals takes us to the inner link page (Disease index page) which displays the various diseases of that group of animals along with its name, visual and also gives audio once the mouse is rolled over the disease. Alongwith the voice a visual appears on the centre of the screen showing the symptom of disease. Now if the farmer is interested in the disease he can click on the icon of the disease and can get more detailed information. This tool is specifically designed to give information on each disease under four major heads i.e., *Parichay* (Epidemiology), *Rogkelakshan* (Symptoms), *Upchar* (Treatment), *roktam* (Prevention and control), to the livestock owners. In first part *Parichay* (Epidemiology) the information on susceptible animal species, age group, transmission agents, season and seriousness of the disease, indicating the probability of animal death in hours is given. In second part *Rogkelakshan* (Symptoms) information on the gross lesions and signs of a particular disease is given in the form of photographs and animations so the livestock owners can understand easily. In third part *Upchaar* (Treatment) information on action to be taken by the farmer after occurrence of particular disease, first aid measures for that disease are presented and moreover, in fourth part *roktam* (Prevention) the information on measures to be taken by the farmers to avoid the occurrence of disease is given. The learning tools, PAKRSP and LPDIS contains original, high quality photographs of majority of the diseases. Further the use

of animations for depicting the various aspects of the diseases makes the learning tool more attractive and clear. Major feature of the learning tool is its interactivity i.e., it can be accessed by the learner as per his choice.

The learning tool so developed has been administered at field level among the livestock owners for assessment of its perceived utility and its effectiveness in transmitting the information to the target audience. Further farmers willingness to pay for the developed self learning tool has also been assessed.

Majority of the livestock owners (62%) found the learning tool (PAKRSP) highly effective for adding to their existing knowledge level while around one third of them (36% livestock owners) considered it as effective and only 3% livestock owners considered it as not effective in enhancing their knowledge level (Table 1). A number of similar experiments on the use of ICT tools for enhancing knowledge in various fields of animal science and poultry have been taken up worldwide and these have also shown the worth of use of ICT tools for enhancing knowledge level of the rural poor/farmers and livestock owners. Some of these initiatives are ‘Livestock Guru’, ‘AHIS’, ‘Poultry expert system’ which have revealed their impact on enhancing the knowledge level of the end users (Raju and Rao, 2006; Heffernan and Nielsen, 2007; Phand, 2008)

Relevance plays a crucial role in cognition and in communication (Sperber & Wilson 2002, Reboul & Moeschler 1998). As cognition is concerned, human beings seem to be sensitive to processing of relevant information and try to minimize cognitive efforts (processing efforts) while looking for cognitive effects. Relevance is best achieved in a learning process when a strong cognitive effort is balanced by a high cognitive effect. This means that in order to be efficient, e-learning should convey maximal information while requiring a strong attention and cognitive effort. Relevance of a learning tool indicates that the tool has great worth or significance to the related aspects i.e.,

Table 1: Perception of livestock owners on effectiveness of learning tool in enhancing knowledge (N=1570)

Effectiveness	Livestock owners	
	Frequency	Percentage
Highly effective	965	61.46
Effective	595	35.99
Not effective	40	2.55

context, content and environment. The developed tool was assessed with respect to the relevance of contents of system to various aspects of important diseases of livestock and poultry. Majority of the livestock owners (53%) found the system relevant while around 44% of livestock owners found it highly relevant. Only 3% of livestock owners considered it as moderately relevant (Table 2). Keniston (2001) reported that the development of locally relevant content is essential; whatever be the mode of communication, the need to present locally relevant information intelligibly both in terms of language and in terms of the level of explanation is imperative.

Preciseness of the learning tool indicates that it should be containing exactly the material purported in the learning tool and should be understandable, internally consistent, and free from ambiguities. The information about all the diseases in the learning tool has been presented in four major subheadings in bulleted form with hyperlinks and has been made concise as far as possible. Rating of the respondents on the preciseness of the learning tool reveal that majority (67%) of the livestock owners found the learning tools to be very precise, while 30% livestock owners stated it to be precise which means that the learning tool was providing exactly the information that it was intended to without unnecessary elaboration. Only around 3% of livestock owners regarded it as not precise and thought that it could be further precised (Table 3).

Table 2: Perception of livestock owners on relevance of contents of the learning tool (N=1570)

Relevance	Livestock owners	
	Frequency	Percentage
Highly Relevant	690	43.95
Relevant	835	53.18
Not Relevant	45	2.87

Table 3: Perception of livestock owners on preciseness of learning tool (N=1570)

Preciseness	Livestock owners	
	Frequency	Percentage
Very Precise	1047 (66.99)	66.99
Precise	475 (30.25)	30.25
Not Precise	48 (3.06)	3.06

Simplicity means that a learning tool contains a minimum of complexity, and its information and interface is simple to understand. In order to understand the subject, the content should be presented in simple and common language. The developed learning tool contain information about 78 diseases of livestock and poultry in English and Hindi language respectively. Majority of the livestock owners (52%) found it to be simple, while 44 per cent reported it to be very simple and only around 4% termed it to be having difficult contents and reported that the contents need further simplification (Table 4).

Table 4: Perception of livestock owners on simplicity of learning tool (N=1570)

Simplicity	Livestock owners	
	Frequency	Percentage
Very simple	689	43.89
Simple	814	51.85
Difficult	67	4.27

A picture/visual is worth a thousand words. There is plenty of evidence from formal research studies to indicate that communication that has a visual component can be far more effective than communication that does not. The psychologist Jerome Bruner of New York University has described studies that show that people only remember 10% of what they hear and 20% of what they read, but about 80 per cent of what they see and do. Training materials used by the federal government cite studies indicating that the retention of information three days after a meeting or other event is six times greater when information is presented by visual and oral means than when the information is presented by the spoken word alone. The same materials also cite studies by educational researchers suggesting that 83 per cent of human learning occurs visually (www.hp.com/large/ipg/assets/bus-solutions/power-of-visual-communication.pdf). Effective visuals accomplish several important goals; they provide visual variety and stimuli to help keep the learner attentive and engaged. The developed learning tool contains original high quality photographs along with animations for each and every piece of information provided. Livestock owners were asked to rate the learning tool on its visual quality viz., photographs, appearance of screen, animations etc. Majority of the livestock owners (72%) reported the visual quality of

the learning tool to be very good and appealing for keeping the learner attentive and engaged while 25 per cent of livestock owners termed it as good. Very few livestock owners (3.5%) rated it to be having average visual quality (Table 5).

Table 5: Perception of livestock owners on visual quality of the learning tool (N=1570)

Visual quality	Livestock owners	
	Frequency	Percentage
Very Good	1128	71.58
Good	387	24.65
Average	55	3.50

There lies immense importance of audio messages in learning and retention. Hearing is said to contribute to 11 per cent to learning after sight (83%) and its contribution to retention is 20% (Dale Edgar, 1965). The content of the learning tool is supported by the voice backup in English and Hindi language respectively, so that even illiterate users can also understand. The respondents were asked about the audibility of voice in terms of its clarity; pitch and pronunciation. Majority of the livestock owners (76%) graded it as having very good audio quality while 21% of livestock owners termed it as having good audio quality. Only 3% livestock owners ranked it as average (Table 6).

Table 6: Perception of livestock owners on audio quality of the learning tool (N=1570)

Audio quality	Livestock owners	
	Frequency	Percentage
Very Good	1195 (76.11)	76.11
Good	329 (20.96)	20.96
Average	46 (2.93)	2.93

Around 71 per cent of livestock owners found the ICT based learning tool PAKRSP was very useful for taking decisions with regards to animal health care, while 23.5 per cent livestock owners found it just useful. Hardly, 5 per cent livestock owners found it moderately useful (Table 7). Researchers have proven that the information delivered through ICT tools are of better quality and lead to making significantly better decisions on all aspects of livestock farming as compared to non ICT tools (Ali, 2003). This, implies that there is a huge

Table 7: Perception of livestock owners on perceived utility of the learning tool (N=1570)

Perceived utility	Livestock owners	
	Frequency	Percentage
Very useful	1119	71.27
Useful	369	23.50
Not useful	82	5.22

potential of delivering information on animal health through present self learning tool in our country and abroad as the system is in the national language Hindi and International Language English.

As regards the observations of respondents about their willingness to purchase the learning tool, majority of them (78.5% livestock owners) were willing to purchase it. Only 21% livestock owners expressed reluctance to purchase the tool (Table 8). The price offered for the PAKRSP by the livestock owners ranged from no cost at all to Rs. 2000. Majority of the livestock owners (64%) were prepared to pay out upto Rs. 50 for purchasing the information system. More or less, 8% of them wanted it to be provided free of cost and some of them (0.2%) were even willing to pay from Rs.1000 to 2000 (Table 9). The major reason for farmers willingness to purchase the learning tool (PAKRSP)

Table 8: Livestock owners willingness to purchase learning tool (N=1570)

Willingness to purchase	Livestock owners	
	Frequency	Percentage
Yes	1233	78.53
No	337	21.46

Table 9: Opinion of livestock owners on proposed price of the learning tool (N=1570)

Proposed price	Opinion of the Livestock owners	
	Frequency	Percentage
Free of cost	123	7.83
Up to Rs. 50	1000	63.68
51-100	157	10
101-200	135	8.6
201-500	120	7.64
501-1000	32	2.04
1001-2000	3	0.19

reported was the information on animal health contained in it. In fact Survey by the National Sample Survey Organization (NSSO) on 'Access to modern technology for farming in India', also indicates that out of those farmers who access any information on animal husbandry around 43 per cent of this information relates to animal health while in Uttar Pradesh state around 70 per cent households access information on livestock health care followed by breeding and feeding which indicates the importance of animal health care information (Ali, 2011).

The self learning tool PAKRSP and its English version LPDIS were widely popularized through the institute Website as well as through various extension methods such as exhibitions, kisan gosthies, printed literature and through the Indian postal services wherein a brief feature and utility of the learning tool was provided. The rate of the both the learning tools i.e., PAKRSP and LPDIS were fixed at Rs. 5000.00 per CD by the institute for each of the tool. A huge response was received in terms of demands from various organizations. Till now the CD of both the self learning tools have been sold to various Pharmaceutical Companies, State Department of Animal Husbandry, State Agriculture Universities, Veterinary Colleges, National Boards, Krishi Vigyan Kendra and various ICAR institute. The Institute has earned a revenue of Rs. 1.97 lakhs till now from the commercialization of these learning tools which depicts the commercial value of these products.

The ICT based learning tool for the farmers 'PAKRSP' is a unique individualized educational mechanism to assist farmers for learning about the various livestock and poultry diseases and their treatment and control measures. Its interactivity allows the farmer to relate to the content, go forward and backward in the content, start at any point depending upon prior knowledge instead of always in a sequential way. It can lead to lower expenditure per farmer to educate them as it can cater to a large number of farmers in less cost. Further the farmers will have freedom to learn at their own speed. Thus the developed tool will help in self-directed learning which will lead to building self-confidence among the farmers. Field assessment of the learning tool in terms of its perceived utility among the farmers has shown that this product is capable of providing self learning experience and can create interest as well as enhance the knowledge of the learners. Making this electronic self learning tool

available through touch screen kiosks at veterinary hospitals, dispensaries, panchayat offices, block offices, milk cooperatives, and other such places of livestock owners interest can go a long way in inculcating awareness and knowledge about the major diseases of livestock and poultry and the ways to cure and prevent them thereby reducing the economic lossess due to livestock diseases.

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An Analytical Study of the Poverty Alleviation Swarnajayanti Gram Swarozgar Yojana and its Beneficiaries

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ABSTRACT

Today, most of Indian population lives below poverty line and is unable to fulfill its basic need of food, clothes and shelter. The process of economic development had made the rich richer while the poor have become poorer. At present Swarnajayanti Gram Swarozgar Yojana is a very important tool for combating unemployment and underemployment in the rural areas and for attacking rural mass poverty and raising the rural poor above the poverty line. The present study was conducted in Morar block of Gwalior district, Madhya Pradesh. The total sample for this study consisted of 300 beneficiaries. It may be stated that after the inclusion of respondents under SGSY programme they utilized the credit/loan in proper way for economic development and their annual income increased in significant way. Out of ten independent variables caste and family type were found to have non-significant relationship with annual income. The coefficient of multiple determinations (R^2) indicated that only 83.03 percent of variation in the increase in annual income of the respondents could be explained by 10 independent variables. The highly significant 'F' value reported the confirmation to the validity of R^2 (0.8303) worked out with the variables identified for the study. The path coefficient analysis revealed that education exhibited highest positive direct effect on the annual income increased of the respondents. Complicated process in getting credit and the benefits of programme are not reached to the needed people were the major constraints. Proper identification of beneficiaries should be made, all the information related to programme should be disseminated timely & properly and proper coordination were found major suggestion in the study.

Keywords: Swarnajayanti Gram Swarozgar Yojana, Poverty Alleviation, Relationships

INTRODUCTION

Poverty in India is widespread, with the nation estimated to have a third of the world's poor. Ever since the introduction of economic planning in India, various programmes and approaches have been adopted for rural development. But all these programmes and their approaches were selective, sporadic piece meal or sectoral in nature. They just cover one or two aspects of rural people in the selected areas. Thus, they produced only marginal impact on the rural life and could not lead to balanced and overall impact on the rural life and could not lead balanced and overall development of rural people. With a view to remove this draw backs, the Swarnajayanti Gram Swarozgar Yojana was introduced.

The SGSY Scheme is operative from 1st April 1999 in rural areas of the country. SGSY is holistic Scheme covering all aspects of self-employment such as

organization of the Poor into Self Help Groups, training, credit, technology, infrastructure and marketing. The scheme is funded by the financial institutions, Panchayat Raj Institutions, District Rural Development Agencies (DRDAs), Non Government Organization (NGOs), Technical institutions in the district; are involved in the process of planning, implementation and monitoring of the scheme. NGO's help may be sought in the formation and nurturing of the Self Help Groups (SHGs) as well as in the monitoring of the progress of the beneficiaries. Where feasible their services may be utilized in the provision of technology support, quality control of the products and as recovery monitors cum facilitators.

The scheme aims at establishing a large number of micro enterprises in the rural areas. The objective of SGSY is to bring assisted family above the poverty line within three years by providing them income generating assets through a mix of bank credit and Government

subsidy. The rural poor such as those with land, landless labour, educated unemployed, rural artisans and disable are covered under the scheme. The assisted families known as Swarozgaris can be either individuals or groups and would be selected from BPL families by a three member team consisting of Block Development Officer Banker and Sarpanch. SGSY is focused on vulnerable section of the rural poor. Keeping the above views the present study was undertaken with following objectives:

- ❖ To analyze the relationships between socio-personal traits and impact of SGSY (In terms of annual income increased).
- ❖ To explore direct and indirect effect of independent variables on dependent variable.
- ❖ To identify the problems faced by the beneficiaries in acquiring benefit of the programme.
- ❖ To seek the suggestions for betterment of the programme.

MATERIAL AND METHODS

There are four blocks in the Gwalior district namely-Dabara, Bhitwar, Ghatigaon & Morar. Out of these Morar block was selected purposively due to maximum numbers of beneficiaries of SGSY programme in comparison to other block of the district. After the selection of block, a complete list of the villages under Swarnjayanti Gram Swarozgar Yojana (SGSY) was obtained from District Rural Development Agency, PRIs, Line department and the financing agencies. Out of 176 villages, 15 villages were selected purposively on the basis of maximum number of beneficiaries. These villages have often been taken by social anthropologists and sociologists as a unit, the study of which can help in understanding of the total culture of which it is a part. A village is thus a small window can enable us to peep into the mainstream of Indian life. For each selected village, a list of beneficiaries was prepared with the help

of list of beneficiaries, obtained from DRDA, PRIs, Line department and financing agencies and 20 beneficiaries of each village were selected randomly by using simple random method. Thus the total sample for this study consisted of 300 beneficiaries'. The data was collected through a well structured and pre tested interview schedule.

RESULTS AND DISCUSSION

The distribution of beneficiary respondents according to impact of SGSY on annual income and the utilization of credit/loan for economic development has been presented in Table 1.

The data in Table 1 indicate that in case of before implementation of SGSY programme, most of the beneficiary respondents (68.67%) belonged to low income group (<Rs. 20,000), followed by 31.33 per cent of them medium income group (Rs. 20,000 to 40,000) and none of them in high income group (>Rs.40,000) beneficiary respondents.

Whereas, after the inclusion in SGSY programme, a higher percentage of the beneficiary respondents (66.33%) belonged to medium income group (Rs. 20,000 to 40,000), 29.34 per cent beneficiary respondents belonged to high-income group (>Rs. 40,000) and only 04.33 per cent of them belonged to low-income group (<Rs. 20,000).

The findings of Badodiya *et al.* (2008) and Nagayach (2007) were in the same line of the present finding. Escher (1986) also supports the present finding reporting that IRDP has also improved the economic status of the beneficiaries and reduced the extent of poverty in the study area. Pearson's coefficient of correlation was worked out to determine the relationship between socio personnel traits of beneficiary respondents namely- age, caste, education, social participation, type of family, size of family, source of information, innovativeness, attitude of beneficiaries towards SGSY & knowledge about

Table 1: Distribution of the respondents according to their annual income increased due to the programme

Categories	Respondents (n=300)			
	Before		After	
	No.	%	No.	%
Low income (<Rs. 20,000)	206	68.67	13	04.33
Medium income (Rs. 20,000 to 40,000)	94	31.33	199	66.33
High income (>Rs. 40,000)	00	00.00	88	29.34
Total	300	100.00	300	100.00

SGSY with annual income increased due to the programme. It is understood from the data reported in Table 2 that variables like education, social participation, size of family, source of information, innovativeness, attitude of beneficiaries towards SGSY and knowledge about SGSY were significant and had positive relationship with increased annual income of the beneficiaries due to the programme and only age was found significant but negative relationship with increased annual income of the beneficiaries, while caste and family type were found to have non-significant relationship with annual income. The findings of Badodiya *et al.* (2008) and Nagayach (2007) were in the same line of the present findings. It can be stated in other words that seems on all the selected socio-personal traits explained a significant amount of variance in the scores of increased annual income due to the programme.

Table 3 presents the regression coefficients between selected socio personal traits of the beneficiary respondents and their increased annual income due to the programme. It is observed that regression coefficient of education (23.965) and knowledge about SGSY production technology (13.319) were significant at 1% level of significance while family size (-1.973) was negatively significant with increased annual income due to the programme at 5% level of significance.

The coefficient of multiple determinations (R^2) indicated that only 83.03 per cent of variation in the annual income increased due to the programme could be explained due to 10 selected independent variables. The highly significant 'F' value reported the confirmation to the validity of R^2 (0.8303) worked out with the variables identified for the study.

Table 2: Correlation between socio personnel traits of the beneficiary respondents and their annual income increased due to the programme

Code	Characteristics	Correlation coefficient (r)	't' Value
X ₁	Age	-0.2389*	-4.20
X ₂	Education	0.4721**	9.07
X ₃	Caste	0.1458	2.60
X ₄	Type of family	0.1332	2.26
X ₅	Size of family	0.2532*	4.51
X ₆	Social participation	0.2861**	5.13
X ₇	Source of information	0.2263*	4.02
X ₈	Innovativeness	0.3411**	6.20
X ₉	Attitude of beneficiaries towards SGSY	0.3267**	5.93
X ₁₀	Knowledge about SGSY	0.4277**	8.02

* Significant at $p = 0.05$; ** Significant at $p = 0.01$

Table 3: Regression analysis of socio personnel traits of the beneficiary respondents and their annual income increased due to the programme

Characteristics	Regression coefficient 'b'	Standard error of regression coefficient 'b'	Computed 't' value
X ₁ Age	0.99	0.35	0.85
X ₂ Education	23.965**	1.760	13.619
X ₃ Caste	0.351	1.282	0.273
X ₄ Family type	-0.045	0.242	0.185
X ₅ Family size	-1.973*	3.211	0.614
X ₆ Social participation	0.677	3.032	0.223
X ₇ Source of information	0.351	1.282	0.273
X ₈ Innovativeness	1.305	1.561	0.836
X ₉ Attitude towards SGSY	0.900	0.890	1.011
X ₁₀ Knowledge about SGSY production technology	13.319**	1.525	8.736

$R^2 = 0.8303$, 'F' value = 3.97 with 10 & 298 d.f.; **Significant at 1% level; *Significant at 5% level

A path coefficient is a standardised partial regression coefficient and as such measures the direct influence of one variable upon another and permits the separation of the correlation coefficients into components of direct and indirect effects.

The results of path analysis (Table 4) further revealed that out of 20 substantial indirect effects, 6 each pass through knowledge about SGSY and education, 5 pass through source of information, 1 each passes through innovativeness, type of family and size of family. Critical analysis of the results pertaining to correlation and path coefficient analyses indicated that the variables education, knowledge about SGSY and source of information had strong positive correlation and high magnitude of positive direct effects on increased annual income due to the programme. Further, the indirect effects of most of the other variables *via* education, knowledge about SGSY and source of information were high and positive.

Contribution of education of the vegetable growers towards their extent of knowledge was sizeable among all the factors followed by mass media exposure, extension participation and occupation indicating that these variables seemed to be important in affecting extent of knowledge directly as well as indirectly.

A close look of the data presented in Table 6 indicate that most of the beneficiaries (71.66%) reported the complicated process in getting credit, followed by the benefits of programme are not reached to the needed people (65.83%), short duration of repayment of loan (62.50%), the time period to get loan is long (59.16%), problems faced in obtaining record from patwari (51.66%), people do not get complete information related to programme and are unable to comprehend it (46.66%), problems faced in filling the bank application form (41.66%) and there is no cooperation between educated and uneducated people (37.50%).

Table 4: Path coefficient showing direct, indirect and substantial indirect effects of independent variables on dependent variable- annual income increased due to the programme

Code No.	Socio- personal traits/ Independent variables	Direct effect	Total indirect effect	Substantial indirect effect through	
				1	2
X ₁	Age	0.0066	0.1343	0.0965 (X ₁₀)	0.0512 (X ₇)
X ₂	Education	0.2956	0.1742	0.0925 (X ₁₀)	0.0679 (X ₇)
X ₃	Caste	0.0087	0.2886	0.1586 (X ₇)	0.0916 (X ₄)
X ₄	Type of family	0.0332	0.0988	0.0530 (X ₂)	0.0171 (X ₈)
X ₅	Size of family	-0.1245	0.2944	0.1524 (X ₁₀)	0.0982 (X ₂)
X ₆	Social participation	0.0985	0.1876	0.0764 (X ₇)	0.0549 (X ₂)
X ₇	Source of information	0.2159	0.1879	0.0812 (X ₁₀)	0.0652 (X ₂)
X ₈	Innovativeness	0.1965	0.1775	0.0862 (X ₂)	0.0341 (X ₁₀)
X ₉	Attitude of beneficiaries towards SGSY	0.0284	0.2868	0.1031 (X ₁₀)	0.0748 (X ₃)
X ₁₀	Knowledge about SGSY	0.2274	0.2132	0.1259 (X ₂)	0.0752 (X ₇)

Table 5: Identify the problems faced by the beneficiaries in acquiring benefit of the programme (N=300)

Constraints	Respondents	
	Percentage	Rank
People do not get complete information related to programme and are unable to comprehend it.	46.66	VI
The benefits of programme are not read to the needed people.	65.83	II
There is no cooperation between educated and uneducated people	37.50	VIII
Complicated process in getting credit.	71.66	I
Short duration of repayment of loan.	62.50	III
Problems faced in obtaining record from patwari/panchayat	51.66	V
Problems faced in filling the bank application/form.	41.66	VII
The time period for getting loan is too long.	59.16	IV

Table 6: Suggestions for improvement of the programme (N=300)

Suggestions	Respondents	
	Percentage	Rank
All the information related to programme should be disseminated timely and properly	65.00	II
Adjustment of subsidies & Credit camps should be conducted regularly	45.67	IV
Ensure proper supply of raw materials, inputs, services and marketing to the beneficiaries	60.00	III
Proper identification of beneficiaries	70.00	I
Proper coordination	65.00	II
Proper monitoring and evaluation	47.50	V
Training to the staff and beneficiaries under SGSY	45.67	VI

The data presented in Table 6 indicate that majority of the (70.00%) respondents suggested that proper identification of beneficiaries should be made. All the information related to programme should be disseminated timely and properly and proper coordination were reported by 65.00 percent of the respondents. Most of the beneficiaries (45.67%) suggested that adjustment of subsidies & credit camps should be conducted regularly. Proper monitoring & evaluation and training to the staff & beneficiaries under SGSY were found the rank fifth and sixth respectively.

CONCLUSION

It may be concluded that after the inclusion of respondents under SGSY programme they utilized the credit/loan in proper way for economic development and their annual income increased in significant way. Out of ten independent variables caste and family type were found to have non-significant relationship with annual income. The coefficient of multiple determinations (R^2) indicated that only 83.03 per cent of variation in the increased annual income of the respondents could be explained due to 10 independent variables. The highly significant 'F' value reported the confirmation to the validity of R^2 (0.8303) worked out with the variables identified for the study. The path coefficient analysis revealed that education exhibited highest positive direct effect on the increased annual income of the respondents. Complicated process in getting credit and

the benefits of programme are not reached to the needed people were the major constraints. Proper identification of beneficiaries should be made, all the information related to programme should be disseminated timely & properly and proper coordination were found major suggestion in the study.

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Yield Gap Analysis Vis-à-vis Factor affecting Sugarcane Production in Madhya Pradesh

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ABSTRACT

India occupies second rank in production of sugarcane in the world. The area under sugarcane in India is 5.03 million hectares during the year 2011-12 and cane production of 342.20 million tonnes and productivity is 68.09 metric tonnes per ha. A yield gap analysis for sugarcane was conducted in Burhanpur district, Madhya Pradesh during 2011-12. The results indicated that sugarcane growers not used recommended dose of manures & fertilizers, insecticide & fungicide for the production of sugarcane cultivation. The sugarcane productivity has shown an increasing trend over the year. The magnitude has been quite trivial, wide gap exists between potential and the realized productivity. The gap between potential yield and realized yield is due to environmental factors, induced cropping system, available varieties, fertilizer application, pest and disease management, socio-economic factors, marketing and post harvest problems.

Keywords: Yield gap, Sugarcane

INTRODUCTION

Madhya Pradesh stands at eleventh position both in terms of sugarcane area and production in India. The area under sugarcane in Madhya Pradesh was 0.06 million ha and cane production was 2.54 million tonnes and productivity was 40.82 metric tonnes/ha during the year 2009-10. Burhanpur district of Madhya Pradesh is one of the most important sugarcane growing district in the state. In Burhanpur district sugarcane is cultivated in 4702.30 hectare with a production of 282138 metric tonnes, productivity 60.73 metric tonnes/ha and sugar recovery of 11.47% during 2011-12. The major sugarcane varieties grown in Burhanpur district are Co-86032, Co-419, Co-94012, CoM-265, Co.VSI-9, CoC-671 and VSI -434.

There is a common observation that most of the technologies evolved remain at the research stations and it is not uniformly adopted by the farmers. There is no exception with sugarcane on the biases of extensive research on sugarcane over past couple of decades; sugarcane technologies are now available which can boost sugarcane production. Although enough viable and adoptive technologies have been developed, many of these have not reached the ultimate growers. This may be one of the reasons for poor average sugarcane

yield and sugar recovery as compared to both potentiality of sugarcane yield and recovery. Sugarcane and sugar output can be increased if the growers adopt the recommended package relating to sugarcane production technology.

The yield gap analysis is a potent research technique that has been introduced in the 1970s. Developed by the International Rice Research Institute (IRRI), it is extensively used to measure and analyze determinants of the yield gaps. It is also observed that, even though the production level has increased to a great extent in the recent past; still there exists a wide gap between the actual yield obtained by the growers and the production level actually possible with the existing modern technology. In the agricultural sector, India, which has exhibited average crop yield of 1040 kg ha⁻¹ for soybean, has still a yield gap index of 78.79 indicating that only 21.21 per cent of existing production potential of soybean is being realized in the country (Bhatia *et al.*, 2006). Since resource use is inefficient, production can be increased by making adjustments in the use of factors of production in the optimal direction. In this regard the following specific objectives were formulated.

1. To study the trends of sugarcane production and productivity in Madhya Pradesh,

2. To quantify the yield gaps in sugarcane production and factors affecting the same and
3. To ascertain the factors affecting the sugarcane production.

MATERIALS AND METHODS

The research study was conducted in Burhanpur district of Madhya Pradesh during 2011-12. An extensive survey was conducted in sugarcane growing villages. A sample of 120 sugarcane growers was drawn from sugarcane growing villages using proportionate random sampling technique. Based on the experts' opinion, factors affecting adoption of recommended sugarcane cultivation practices were studied. All the selected farmers were interviewed personally using a well-structured interview schedule. For analysis of collected data, descriptive statistics was used.

The yield gaps were quantified using tabular analysis. Some of the concepts which have been used in the study are defined and operationalised below:-

1. Yield gap refers to the difference between the potential yield and actual farm yield.
2. Potential yield refers to that which is obtained in the experiment station. The yield is considered to be the absolute maximum production of the crop possible in the given environment, which is attained by the best available methods and with the maximum inputs in trials on the experiment station in a given season.
3. Potential farm yield is the yield obtained on the demonstration plots on the farmers' fields in the study area. The conditions on demonstration plots closely approximate the conditions on the cultivators' fields with respect to infrastructural facilities and environmental conditions.
4. Actual yield refers to the yield realized by the farmers on their farms under their management practices. Yield Gap-I corresponds to the difference between experiment station and potential farm yield. Yield Gap-I is hypothesized to be caused by either the environmental differences between experiment station and farmers' fields or by non-transferable technology.
5. Yield Gap-II corresponds to the difference between potential farm yield and the actual farm yield. It is hypothesized to be caused by biological and socio-economic constraints; biological constraints stem

from the non-application of essential production inputs and the socio-economic constraints from the social or economic conditions that prevent farmers from using the recommended technology.

6. Index of yield gap refers to the percentage of yield potential unrealized i.e.,

$$\text{Index of yield gap} = \frac{(\text{Potential yield} - \text{Actual yield})}{\text{Potential yield}} \times 100$$

RESULTS AND DISCUSSION

Data depicted in the Table 1 revealed that during past 10 years, area as well production of sugarcane in Burhanpur district having increasing trend. However, yield of sugarcane is stagnant or decreasing which may be due to lack of applicable technology as its proper application by the growers.

Data presented in Table 2 indicated that the average productivity of sugarcane in India was maximum in the year 2009-10 and it was 70.02 tonnes per hectare. But in the present year (2011-12) it again dropped back to 68.09 tonnes/ha (comparable to that in the initial year of the table 2000-01). The reasons for less productivity might be improper agronomic management practices or the variation in the several biotic and abiotic environmental factors.

The data of table 3 revealed that the yield gap% with state varies from 39.39 to 44.75 during 2001-2012. Only about 55-60% of the yield was achieved at district level compared to the potential yield of the state (107.25 tonnes/ha). The yield gap percent with the district varies from 23.54 to 30.30 during 2001-2012. At district level 75 to 80% of the potential yield of the district (85 tonnes/ha) was achieved. The potential yield of district was lower compared to the potential yield of the state. However, there was a prominent yield gap per cent in both cases, so that there was a strong possibility to boost up the productivity and returns from the input invested.

Several factors are affecting the sugarcane production in the Burhanpur district as well as other sugarcane growing areas. Most important are given below in brief.

Low adoption of high yielding variety: The main reason for low adoption of high yielding varieties was mainly due to lack of awareness about the hybrids, as well as due to conservative mindset of not liking to replace their traditional land races grown over years.

Table 1: Block wise area, production and productivity of Burhanpur district

Year	Burhanpur Block			Khaknar Block		
	Area (ha)	Production (tonnes)	Yield/ha	Area (ha)	Production (tonnes)	Yield t/ha
2000-01	816.50	48990	60	3010.00	180600	60
2001-02	909.40	56382	62	2705.70	167753	62
2002-03	1110.00	71040	64	3353.00	201180	60
2003-04	1318.10	85675	65	3571.60	225010	63
2004-05	912.90	54775	60	2414.10	156916	65
2005-06	904.50	54270	60	3017.50	180870	60
2006-07	1158.00	75270	65	4238.30	271251	64
2007-08	1939.20	126035	65	4994.70	324655	65
2008-09	961.10	58876	61	2544.50	162848	64
2009-10	809.20	48552	60	2056.56	123393	60
2010-11	1316.80	82958	63	3040.00	191520	63
2011-12	1508.70	90522	60	3193.60	191616	60

Source: NSSKM, Burhanpur (M.P)

Table 2: Area, Production and Productivity of sugarcane in India

Year	Area (ha)	Production (tonnes)	Yield t/ha
2000-01	4.32	295.96	68.57
2001-02	4.41	297.21	67.37
2002-03	4.52	287.38	63.57
2003-04	3.93	233.86	59.38
2004-05	3.66	237.08	64.75
2005-06	4.20	281.17	66.92
2006-07	5.15	355.52	69.02
2007-08	5.06	348.19	68.87
2008-09	4.42	285.03	64.55
2009-10	4.17	292.30	70.02
2010-11	4.94	339.17	68.59
2011-12	5.03	342.20	68.09

Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation, GOI.

Inappropriate plant protection measures: It was due to improper or lack of knowledge regarding the timely application of the necessary plant protectants (insecticide, pesticides, herbicides, etc). The various complexities originating in the mind of farmers led to such problems.

Inadequate nutrient management: Sugarcane was giant crop producing a high quantity of biomass and therefore its nutrient requirement was high. Improper knowledge regarding the nutritional status of the soil, and at what time fertilizer was to be applied, fertilizer response by the variety problem of labour led to inadequate nutrient management.

Conventional irrigation management: Due to improper usage of water due to less efficient methods of irrigation like flooding most of the water was not utilized by the plant due to various kinds of losses, which led to unavailability of water at various critical stages during the crop growth periods. Lack of awareness and funds are the main reason which did not allow the farmers to adopt more efficient methods like drip irrigation.

Low application of organic matter & bio-fertilizer: Due to improper knowledge regarding the benefits involved from the application of bio-fertilizers and the potential benefits from the usage was not clear to the farmers so they hesitated to adopt such traits. Moreover for quick benefits they only relied on chemical fertilizers which gave the quick result in short term but regarding the long term they tend to decrease the yield by impairing the soil health.

CONCLUSION

Yield gap percentage with state was 44.75 during 2011-12. It could be concluded that in the district level we have achieved only about 55 percentage of the yield as compared to the potential yield of the state. The yield gap percent with the district varies from 23.54 to 30.30 percent during 2001-2012 which indicates that in district level we have achieved about 75 to 80 percent of the potential yield of the district. The potential yield of district found lower as compared to the potential yield of the state. There is a prominent yield gap at both the cases, so that there is a strong possibility to boost up the productivity and give the farmer more return from

Table 3: Comparative study of yield gap analysis of Sugarcane yield of Burhanpur district with Madhya Pradesh

Year	Area (ha)	Production (tonnes)	Productivity (tonnes/ha)	Yield gap % comparison with State	Yield gap % comparison with district
2000-01	3875.50	229590	59.24	44.75	30.30
2001-02	3615.10	224135	62.00	42.19	27.07
2002-03	4463.00	272220	61.00	43.12	28.24
2003-04	4889.70	310685	63.53	40.75	25.25
2004-05	3327.00	211691	63.62	40.67	25.15
2005-06	3922.00	235140	59.95	44.09	29.47
2006-07	5396.30	346521	64.21	40.12	24.45
2007-08	6933.90	450690	65.00	39.39	23.54
2008-09	3505.60	221724	63.24	41.02	25.60
2009-10	2865.76	171945	60.00	44.06	29.42
2010-11	4356.80	274478	63.00	41.26	25.89
2011-12	4702.30	282138	60.00	44.05	29.41

(Potential yield of State= 107.25 tonnes/ ha.), (Potential yield of district= 85.00 tonnes per ha)

the input invests. Thus, if proper attention could be given by the policy makers and the extension functionaries for reducing the yield gap and enhancing the sugarcane yield for increasing the income of the farmers.

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Information Sources Utilized by the Self Help Group members of New Alluvial Zone of West Bengal*

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ABSTRACT

A study was conducted to trace out the sources of information; extent of utilization of sources and usefulness of these sources to the Self Help Group (SHG) members of new alluvial zone of West Bengal information sources utilized by the SHG members. A total 200 SHG members were selected from 20 credit linked SHG by multistage random sampling method. The result indicated that among all the sources of information, NGO/facilitator, member of the other groups were the main sources of information of the SHG member. The maximum information pertaining to SHG activities was drawn from the sources like member of the other group, NGO/facilitator (informal), training, TV (formal) etc. SHG members perceived that most useful information sources are NGO/facilitator, family member(s) (informal), training, Village Level Worker (VLW).

Keywords: Information source, Self help group, New alluvial zones of West Bengal

INTRODUCTION

Using information is a key issue in the information age. The real challenge of our time is not only producing information or storing information, but getting people to use of this information. Information is a critical resource in the operation and management of organizations. People are organized under the umbrella of Self Help Groups (SHGs) to fulfill different purpose depending on the situation (Sharma and Varma, 2008). SHG is a unique forum that can help people to be visible and ensure more importance in the community (Sharma, 2011). Not only members of the group, other people of the community get benefitted through sharing information and available resources. The SHGs have basically provided access to vast volume of information and helped in their processing, more competently. Thus, if our intention to improve both quality as well as quantity of information, use of information sources and /or channels which are essential for the reception of message cannot be ruled out. Considering above discussions, the present study was concentrated on the sources of information; extent of utilization and usefulness of these sources to the SHG members of New Alluvial Zone of West Bengal.

MATERIALS AND METHODS

Based on rainfall, temperature, soil type and topography of land, West Bengal has been divided into six agro-climatic zones, viz. Hill zone, Terai zone, Old alluvial zone, New alluvial zone, Red- Laterite zone, and Coastal saline zone. The New Alluvial Zone is the heart of West Bengal in terms of agricultural productivity, animal husbandry proficiency and has potential to improve in all angles of development for the sustainable livelihood security of rural people. So, the New Alluvial Zone was selected purposively for this study. The New Alluvial zone is comprised of different part of few districts but entire Nadia district is laid in this zone. So, Nadia district was selected purposively. Out of four sub-divisions in Nadia, two sub-division *i.e.* Sadar Krishnanagar and Ranaghat were selected purposively as these two sub-divisions had the highest number of credit linked SHGs at the time of data collection. Ranaghat-I and Ranaghat-II block from Ranaghat sub-division and Krishnanagar-II and Nakashipara block from Sadar Krishnanagar sub-division were selected purposively as these four blocks from two sub-divisions had the highest number of credit linked SHGs at the time of data collection. So, a total of four blocks were

covered under this study. From each selected block, 5 credit linked SHGs were selected randomly. Hence, a total 20 credit linked SHG were covered under this study. From each credit linked SHG, 10 members were selected randomly. Then, a total 200 SHG members were covered under this study.

A list of expected communication sources was prepared during a pilot study conducted in a non sample area of Nadia district with 50 respondents from five credit linked SHGs. SHG members were asked to rate their response on four point continuum interview schedule; most of times (3), sometimes (2), less of time (1) and never (0) for evaluating the sources of information and three point continuum for extent of information drawn from different sources of information; most of information (3), some of information (2) and less of information (1) and usefulness of information sources; most useful (3), somewhat useful (2) and less useful (1). Ranking of different information sources were done as per their Total Rank Order Score (TROS) for importance of information sources, extent of information drawn and usefulness of each sources of information. Total Rank Order Score (TROS) was calculated by using the following formula;

$$\text{TROS} = 3 \times N_i + 2 \times N_j + 1 \times N_k$$

Where,

TROS = Total Rank Order Score

N_i = Frequency of respondents quote the information source as most of time, most of information and most useful for importance of information sources, extent of information drawn and usefulness of each source of information respectively.

N_j = Frequency of respondents quote the information source as some times, some of information and somewhat useful for importance of information sources, extent of information drawn and usefulness of each source of information respectively.

N_k = Frequency of respondents quote the information source as less of time, less of information and less useful for importance of information sources, extent of information drawn and usefulness of each source of information respectively.

Personal interview method and focused group discussion (FGD) was applied for data collection at the

respondents' doorstep with the help of a pre-tested structured interview schedule.

RESULT AND DISCUSSION

Free flow of information is the key for proper functioning of any organization. Information sources or channels have a great role in free flow of information. Therefore, an attempt has been made to judge various kinds of sources/channel, extent of information drawn from each source/channel and usefulness of these information to the activity of SHGs. Table 1 explores different sources or channels of information used by SHG members of Nadia district of West Bengal. All the sources have been broadly classified into formal source and informal source with the consultation of the previous research findings. The same table clearly indicates that NGO/facilitator, member of the other groups were the main informal sources of information. The findings seem to be logical because NGO/facilitators were directly associated with the SHG members. NGO/facilitator used to help in SHG formation and passed the relevant important information to members of SHG related to their SHG activities. As per formal sources of information concerned, training ranked first. Television, exhibition and programme officials were the other most quoted formal sources of information. Training of the SHG members in various fields like goat terry, poultry, wool knitting etc was enough to provide the latest technical know-how with convening reasons. Television and exhibition provide the wide coverage with rationality.

Figure 1 clearly depicted that from both formal and informal sources of information, NGO/facilitator of the SHG, members of the other group and training got more importance than the other source of information. It was also found that members of the SHG gave importance to both the formal and informal sources. But Kadian (98) reported that farmers of Himachal Pradesh preferred different informal sources of information like friends, programme officials, progressive farmers where as Meena (97) reported that farmers gave more importance to the different formal sources like radio and animal fair.

SHG members of Nadia district did not extract equal information from each source of information. Table 2 clearly depicts that the relative importance of each source of information in terms of the extent of information drawn from each source. It was found from

Table 1: Sources/channel of information used by the self help group members (N = 200)

Sources of information	Frequency of respondents in different preference				Total rank order score	Rank order
	Most of times (3)	Some times (2)	Less of time (1)	Never (0)		
Informal sources						
Member of the other groups	62	82	54	2	404	2 (II)
Family member	31	104	60	5	361	6 (XI)
Friend	41	75	81	3	354	7 (XII)
Relative	47	77	69	7	364	5 (X)
Neighbour	49	96	46	0	385	4 (VI)
Local Leader	62	78	55	5	397	3 (V)
NGO/Facilitator	77	77	35	11	420	1 (I)
Formal sources						
Bank	26	74	93	7	319	8 (XV)
Programme official	56	83	38	23	372	4 (VIII)
VLW	46	86	62	6	372	5 (IX)
Training	67	72	54	7	399	1 (III)
Exhibition	59	73	60	8	383	3 (VII)
Radio	27	94	67	12	336	7 (XIV)
TV	57	86	54	3	397	2 (IV)
Newspaper	39	83	71	7	354	6 (XIII)

(Note: Values in parenthesis indicate the overall rank of information sources/channels)

Table 2: Extent of information drawn from different sources/channels of information by the self help group members (n = 200)

Sources of information	Frequency of respondents in different preference			Total rank order score	Rank order
	Most of information	Some of information	Less of information		
	(3)	(2)	(1)		
Informal sources					
Member of the other groups	87	93	20	467	1 (I)
Family member	53	113	34	419	5 (IX)
Friend	57	82	61	396	6 (XII)
Relative	38	113	49	389	7 (XIV)
Neighbour	70	95	35	435	3 (IV)
Local Leader	60	111	29	431	4 (VI)
NGO/Facilitator	70	99	31	439	2 (II)
Formal sources					
Bank	25	128	47	378	8 (XV)
Programme official	74	87	39	435	1 (III)
VLW	46	107	47	399	5 (X)
Training	77	78	45	432	2 (V)
Exhibition	56	113	31	425	4(VIII)
Radio	55	86	59	396	7(XIII)
TV	65	97	38	427	3 (VII)
Newspaper	48	102	50	398	6 (XI)

(Note: Values in parenthesis indicate the overall rank of extent of information drawn from different sources/channels)

the same table that SHG members drew maximum information from the different informal sources like members of the other groups, NGO/facilitators and neighbors. Programme officials, training, TV and exhibition were found to have more importance than other formal sources. Members of the SHG perceived that member of the other groups, NGO/facilitator, programme official, neighbours were found to have more importance from both the informal and formal sources (Fig. 2). They also perceived that sources like bank, radio, newspaper and friend used to provide very less information as per their need. It seems that major criteria for consulting a source of information by the respondents was the extent of knowledge gained from that source.

SHG members perceived that all the information sources had some beneficial effect but level of usefulness was different and this differentiation is mainly due to several factors like accessibility, education level of the members etc. Rank of all information sources is presented in the Table 3 and this ranking was done on the basis of the perception of SHG members regarding the usefulness of each sources of communication. Among informal sources of information, NGO/facilitator, family members, neighbors and local leader were provided more useful

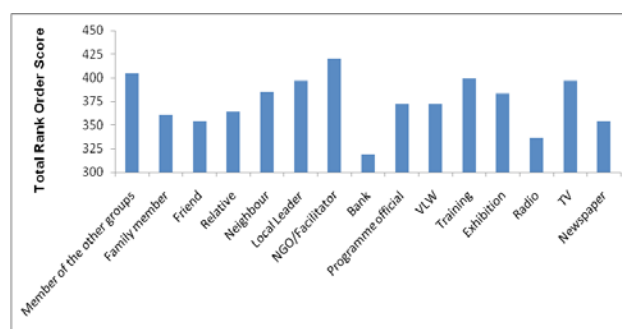


Fig. 1: Sources/channels of Information Used by the SHG members

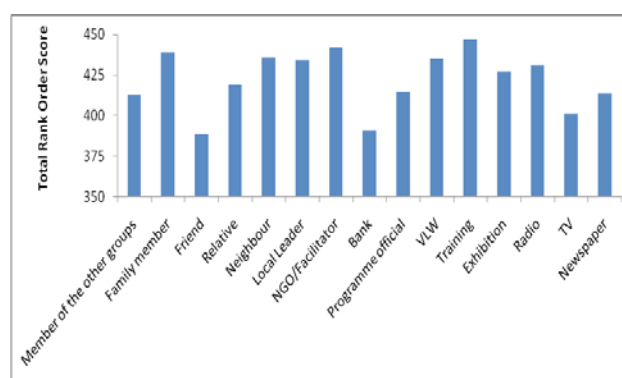


Fig. 2: Extent of information drawn from sources information by the SHG members

Table 3 : Usefulness of information sources/channels as perceived by the self help group members (N=200)

Sources of information	Frequency of respondents in different preference			Total rank order score	Rank order
	Most useful (3)	Somewhat useful (2)	Less useful (1)		
Informal sources					
Member of the other groups	46	121	33	413	6 (XII)
Family member	73	93	34	439	2 (III)
Friends	49	91	60	389	7 (XV)
Relatives	53	113	34	419	5 (IX)
Neighbours	68	100	32	436	3 (IV)
Local leader	72	90	38	434	4 (VI)
NGO/facilitator	73	96	31	442	1 (II)
Formal sources					
Bank	30	131	39	391	8 (XIV)
Programme official	63	89	48	415	5 (X)
VLW	72	91	37	435	2 (V)
Training	79	89	32	447	1 (I)
Exhibition	58	112	29	427	4(VIII)
Radio	210	182	39	431	3(VII)
TV	48	105	47	401	7(XIII)
Newspaper	59	96	45	414	6 (XI)

(Note: Values in parenthesis indicate the over all rank of usefulness of information sources/channels as perceived by the respondents)

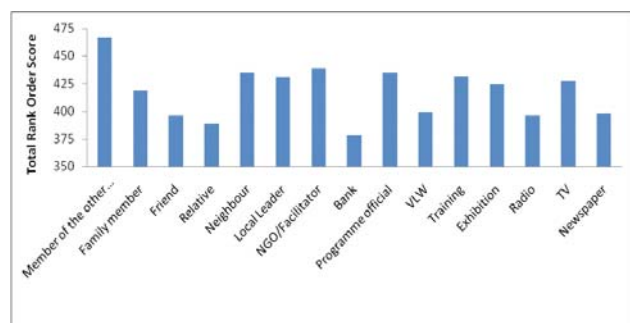


Fig. 3: Usefulness of information sources/channel as perceived by the SHG Members

information as perceived by SHG members. However, sources like friends, member of the other groups, relatives from whom maximum information had been drawn were provided less useful information related to SHG activities. As far as the formal sources of information concerned, training, VLW, radio and exhibition were provided more useful information as perceived by SHG members.

Figure 3 clearly depicts that among both informal and formal sources of information, training, NGO/facilitator, family members and neighbours were provided more useful information as perceived by SHG members. These findings are relevant because these informal and formal sources contained high intensity of influence in matters of understanding the messages and conviction which lead to acceptance of useful information about group activities.

CONCLUSION

From this study, it has been concluded that NGOS/facilitator, members of the other groups, local leaders, training and TV were the main sources of information to the SHG members for smooth functioning of their group activities. The maximum information was drawn by the SHG members as per their need from both formal and informal sources of information like members of the other group, NGO/facilitator, training, TV etc. They also perceived that the sources like NGO/facilitator, family members, training, VLW, etc were supplied more useful information than the other sources of information. It was also concluded that informal sources of information got more importance by the SHG members than the formal sources of information.

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Adoption of Improved Dairy Farming Practices in South-West Delhi District

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ABSTRACT

The present study was conducted in south west Delhi district, a typical peri-urban area with concentrated dairy farming villages in Najafgarh tehsil. Results of the study revealed that very small dairy farmers had lower adoption of scientific dairy management practices, whereas most of the farmers were not able to follow improved management practices. The analysis of variance (ANOVA) revealed that the differences between the groups of scientific dairy farming practices of dairy farmers were significant as indicated by the significant F-value (3.390).

Keywords: Adoption, Dairy farming

INTRODUCTION

Indian rural and peri-urban systems are dependent of agriculture and animal husbandry for livelihood and earning of profit. Land and animal are integrated parts of agriculture. Dairying has emerged as a livelihood option for vast population of rural and peri-urban areas in India. It provides source of livelihood to diverse socio-economic classes of population—from landless labour to land lords. Its special feature to suit diverse socio-economic conditions has made it possible to be adopted on wide basis. India ranks first in milk production in the world as it has increased its production over six times from 17 million tonnes in 1950-51 to 120.1 million tonnes in 2010-11. The per capita availability has also increased from 112 grams per day in 1968-69 to 281 grams in 2010-11 (Bhasin, 2009). But, it is still lower than the world average per capita milk availability. About 80 per cent of the milk produced is still handled by the unorganized sector in India (Bansil, 1990); there is large scope for increasing milk production and productivity, to improve the coverage of organized milk production, processing, marketing and distribution. There is a need to pay attention on extent of gap and reasons for gap in potential and actual productivity and efficiency of these dairy units. Dairying is practiced in both villages and peri-urban areas and also on small and large scale. These different kinds of dairying situations have different technological suitability for management of dairy farms

and hence need separate focus on each type. In the below presented study, focus was on the peri-urban dairying around the city of New Delhi.

MATERIALS AND METHODS

The study was conducted in 49th ward (Nangli dairy) and ward 53rd (Goyla dairy) of Najafgarh Tehsil in South West Delhi district of Delhi. The study area represents a typical peri-urban area with concentrated dairy farming units. 30 dairy farms from each ward were selected randomly thus making a total of 60 dairy farms which forms the sample study.

The data was collected by using pre-tested interview schedule through personal interview of the dairy owners and operators. The adoption index was calculated with the formula:

$$\text{Adoption index} = \frac{\text{Mean score obtained}}{\text{Expected maximum score}}$$

RESULTS AND DISCUSSION

Distribution of Dairy Farmers based on adoption of Scientific Dairy Farming Practices: The adoption scores, so computed, were classified into low, medium and high level of adoption for each practice, namely breeding, feeding, health care and dairy management along with overall scientific dairy farming practices. The different categories of dairy owners, namely very small,

small, medium and large were then distributed into low, medium and high level of adoption which is presented in the Table 1.

Very small: A perusal of figures in the Table 1 indicates that a majority (66.66%) of very small dairy farmers had medium level of adoption of breeding practices followed by low (16.17%) and high (16.17%). There were 27.27, 55.56 and 16.17 per cent very small dairy farmers in low, medium and high level of adoption of feeding practices, respectively. In case of health care practices again a vast majority (83.83%) of very small dairy farmers belonged to medium level of adoption followed by high (11.10%) and low (05.05%), Whereas in case of dairy management practices, majority (61.10%) of the very small dairy farmers were having medium level of adoption. As far as adoption of all the dairy innovations is concerned, a majority proportion (66.67%) of very small dairy farmers were found to have medium level of adoption followed by equal proportion (16.67%) having low and high overall adoption.

Small : It is evident from the Table 1 that more than half of the small dairy farmers (66.67%) are in medium adoption category of breeding practices, where as nearly three fourth (72.70%) of the small dairy farmers fall in medium adoption category of feeding practices. In case of health care practices, vast majority (83.30%) of small dairy farmers were in medium level of adoption and 61.10% of the small dairy farmers were found to be

adopting dairy management practices at medium level of adoption. In overall adoption of scientific dairy farming practices, more than half (66.67%) of small dairy farmers had medium level of adoption. *Medium :* It could be visualized from Table 1 that a large majority (78.57%) of the medium dairy farmers had medium level of adoption of breeding practices. As far as feeding practices are concerned, a very large proportion (85.70%) of medium dairy farmers had medium level of adoption. It is important to mention that none of the medium dairy farmers was found to have high adoption level of feeding practices. In case of health care practices, a maximum proportion (71.40%) of medium dairy farmers had medium level of adoption. Whereas, slightly more than half (57.14%) of the medium dairy farmers had medium level of adoption of dairy management practices. Again, majority (78.57%) of the medium dairy farmers had medium level of adoption of overall scientific dairy farming practices.

Large: A quick glance at the Table 1 indicate that a vast majority (82.05%) of large dairy farmers had medium level of adoption of breeding practices. In case of feeding practices, again majority (76.92%) of the large dairy farmers had medium level of adoption. slightly more than three fourth (76.92%) of large dairy farmers who had medium level of adoption of health care practices, whereas, little more than half (58.97%) of

Table 1: Distribution of different categories of dairy farmers according to their level of adoption of scientific dairy farming practices (SDFPs)

Dairy farmer's category	Level of adoption	Adoption areas of different SDFPs				
		Breeding f (%)	Feeding f (%)	Health care f (%)	Dairy management f (%)	Overall SDFPs f (%)
Very small (n=18)	Low	3 (16.17)	05 (27.27)	01 (05.05)	02 (11.10)	06 (16.16)
	Medium	12 (66.66)	10 (55.55)	15 (83.33)	11 (61.10)	12 (66.67)
	High	03 (16.16)	03 (16.16)	02 (11.10)	05 (27.27)	03 (16.17)
Small (n=18)	Low	03 (16.17)	03 (16.17)	02 (11.10)	01 (05.05)	03 (16.17)
	Medium	12 (66.67)	13 (72.70)	15 (83.30)	11 (61.10)	12 (66.67)
	High	03 (16.17)	02 (11.11)	01 (05.05)	06 (33.30)	03 (16.17)
Medium (n=14)	Low	02 (14.28)	02 (14.30)	02 (14.30)	04 (28.60)	02 (14.30)
	Medium	11 (78.57)	12 (85.70)	10 (71.40)	08 (57.14)	11 (78.57)
	High	01 (07.10)	00 (00.00)	02 (14.30)	02 (14.30)	01 (07.10)
Large (n=10)	Low	01 (10.26)	03 (07.69)	06 (15.39)	03 (28.21)	01 (10.26)
	Medium	08 (82.05)	07 (76.92)	07 (76.92)	05 (58.97)	07 (76.92)
	High	01 (07.69)	02 (15.39)	01 (07.69)	02 (12.82)	02 (12.82)
Overall	Low	10 (16.17)	10 (16.17)	17 (11.67)	13 (21.66)	09 (15.50)
	Medium	45 (75.00)	46 (76.70)	48 (80.00)	34 (56.67)	41 (68.30)
	High	05 (08.33)	04 (06.67)	05 (08.30)	13 (21.66)	10 (16.67)

large dairy farmers had medium level of adoption of dairy management practices. Again majority (76.92%) of the large dairy farmers were in medium category of level of adoption for overall scientific dairy farming practices.

Overall: It can further be seen from Table 1 that a large majority (75.00 %) of the medium dairy farmers had medium level of adoption of breeding practices. As far as feeding practices are concerned, a large proportion (76.70 %) of medium dairy farmers had medium level of adoption. In case of health care practices, a maximum proportion (80.00%) of medium dairy farmers had medium level of adoption. Whereas, majority (56.67 %) of the medium dairy farmers had medium level of adoption of dairy management practices. Again, majority (68.30 %) of the medium dairy farmers had medium level of adoption of overall scientific dairy farming practices. The findings are inline of Sinha (1997) and Singh (2010) who stated that maximum adoption was found in case of feedings (36.42%). The mean score of management practices was 36.91 per cent. Whereas overall adoption was 31.21 per cent.

From the above results, it is concluded that majority of the dairy farmers in all the categories, viz., very small, small, medium and large had medium level of adoption of scientific dairy farming practices including breeding, feeding, health care and dairy management practices.

Comparison of Mean Adoption Scores of Scientific Dairy Farming Practices of different Categories of Dairy Farmers: The data was subjected to ANOVA with a view to ascertain whether the differences in the adoption levels between the different categories of dairy farmers, namely, very small, small, medium and large, and the differences between each component of scientific dairy farming

practices (group), namely breeding, feeding, health care and dairy management practices were significant or not. The results of ANOVA are presented in Table 2.

Table 2. Analysis of Variance

Source of variation	d.f.	M.S.S.	F-value
Between Categories	3	120.473	1.907 ^{NS}
Between groups	3	214.193	3.390*
Error	9	63.178	-
Total	15	Correction factor : 78096.49	

* Significant at 10 per cent level of probability, NS=Non-significant

The analysis revealed that the differences between the dairy farmers groups about scientific dairy farming practices were significant as indicated by the significant F-value (3.390).

Extent of percent adoption score of various scientific dairy farming practices of different categories of dairy farmers: The Table 3 depicts that the overall adoption levels of scientific dairy farming practices were 59.34, 70.61, 74.09 and 75.48 per cent by very small, small, medium, large and dairy farmers, respectively. The overall adoption score was 70.75 per cent. Results are found to be in line with the findings of Singh, Kumar & Meena, 2010.

The Table 3 further indicates that very small dairy farmers had significantly higher adoption in health care as compared to other dairy farming practices like breeding, feeding and dairy management. In case of other categories of dairy farmers (small, medium and large), the highest adoption was obtained in scientific feeding practices of dairy animals. It is interesting to mention here that very small dairy farmers had minimum adoption of feeding practices as they were not growing green fodder of their own due to paucity of

Table 3. Extent of percent adoption of various scientific dairy farming practices of different categories of dairy farmers

S. N.	SDFPs*	Extent of adoption (% core)				
		Very small (n=18)	Small (n=18)	Medium (n=14)	Large (n=10)	Total (N=60)
1.	Breeding	61.11	66.67	71.42	70.00	68.41
2.	Feeding	50.00	83.30	85.60	80.00	80.91
3.	Health care	66.67	66.67	64.28	70.00	63.12
4.	Dairy management	61.11	64.33	69.44	70.00	66.45
5.	Overall	57.34	72.61	74.09	80.00	70.75

*Scientific dairy farming practices

land available to them. However, the health care service was provided to them freely and easily due to better infrastructure facilities, and hence, they were availing better health care facilities to their dairy animals.

CONCLUSION

Based on the various findings of this investigation, it was understood that, very small dairy farmers had lowest level (57.34%) of overall adoption of scientific dairy farming practices, whereas, all other categories viz., small, medium and large dairy farmers had fairly higher level of adoption as 72.61, 74.09 and 80.00 per cent respectively. The further analysis concludes that the dairy farmers had highest adoption in case of dairy feeding practices (80.91%), although very small dairy farmers had lowest level (50.00%) of adoption in case

of feeding practices. The main reason attributable for this fact is that their poor economic condition. They allowed their animals to graze the agricultural waste and round side grasses.

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Developing Scale to Measure Quality Orientation of Agricultural Scientists

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ABSTRACT

The growing concern over enhancing the standard of research outputs of the public agricultural research system of this country has enunciated the urgent need for enhancing quality orientation among the scientists working under it. In this context, the present study had been undertaken to design a suitable measuring instrument to measure the extent of quality orientation among agricultural scientists. The sample of the study comprised of two hundred agricultural scientists belonging to different cadres from a low performing institute (LPI) and a high performing institute (HPI). Standard procedure was followed to develop a Likert type quality orientation scale that consisted of fifteen statements. The results of the study showed that majority of the scientists from the LPI had only a lower level of quality orientation whereas, half of the total number of scientists from the HPI had a medium level of quality orientation. As compared to only 6% of scientists from the LPI as high as 38% of the scientists from the HPI had high level of quality orientation. As far as the pooled sample is concerned, about one third (33%) of the scientists had a lower level of quality orientation. Forty five percent and 22% of the pooled sample had respectively medium level and high level of quality orientation. The result of a one way ANOVA showed that there was statistically significant difference in quality orientation among the several cadres of agricultural scientists under study.

Keywords: Scale, Quality orientation, Agricultural scientists

INTRODUCTION

As long as newly emerged environmental threats in diverse forms coupled with the issue of stagnant agricultural growth rate has created uproar in the scientific community, agricultural research has become more and more complex in nature. The research efforts made by the scientists working under the public agricultural research system of this country to tackle these issues have hitherto been felt insufficient. Enhancing research standard and thereby quality of the research outputs of the system has become the general concern. The scientists working under the Indian Council of Agricultural Research (ICAR) and State Agricultural Universities (SAUs) have been the major actors in the process of knowledge generation and its dissemination. It has been experienced that mere quantitative approach of the scientists to deal with research problems and their outcome is a major

hindrance in scientific breakthrough which is deliberately needed given the present context of stagnant agricultural productivity, food security and other pressing issues. It is imperative to inculcate the habit of 'accomplishment with quality' among the scientists working under the public agricultural research system for sustaining its high standard. Keeping this in view, the present study was conducted with the objective of measuring quality orientation among agricultural scientists and designing a suitable scale as the prime requirement.

MATERIALS AND METHODS

Quality orientation for the purpose of the present study was operationalized as the degree to which the scientist had been concerned with high quality professional work. An ex-post facto research design was adopted in the present study which was conducted in two different locales. It was decided to conduct the study in a high

performing and a low performing agricultural institute. Whether quality orientation among scientists varies in differently performing institutes was considered to be important to understand to formulate a logical hypothesis for establishing relationship between quality orientation and scientific performance. Following the composite ranking of Indian agricultural universities on different parameters by Education Times (2009), purposively Indian Agricultural Research Institute (IARI), New Delhi was selected among the high performing institutes (HPIs) and Chandra Sekhar Azad University of Agriculture and Technology (CSAUA&T), Kanpur, Uttar Pradesh was selected among the low performing institutes (LPIs). A multistage disproportionate stratified random sampling (without replacement) technique (Cochran, 1977) was adopted and a sample of two hundred agricultural scientists, hundred each from the HPI and LPI was selected. The steps followed in construction of a Likert (1932) type quality orientation scale have been given below:

Collection of statements pertaining to quality orientation: Statements related to quality orientation were collected through carefully studying the available literature and in consultation with the experts. A total of 38 statements were initially collected in this process.

Scrutiny and editing of quality orientation statements: The collected statements were carefully examined and edited in light of the informal criteria for editing statements as suggested by Wang (1932), Thurstone and Chave (1929), Likert (1932), and Edwards and Kilpatrick (1948). After discarding 14 repeated, restructured, and ambiguous statements, 24 statements were retained for further analysis.

Primary administration: A proforma was designed with these 24 statements. Each of the statement had a five-point continuum, namely, strongly disagree, disagree, undecided, agree, and strongly agree. A representative sample of respondents comprising of 50 agricultural scientists were personally interviewed with the proforma and were asked to respond in any one of the five response categories against each statement according to their perception.

Analysis of quality orientation statements and scoring: The scoring pattern adopted for the statements was 0 to 4 for the favourable statements and the reverse for unfavourable statements. The total score obtained by each of the 50 sample respondents was calculated by adding the scores obtained by them for

the individual statements.

Final Selection of Quality Orientation statements:

The frequency distribution of respondents' scores was obtained. Following Edwards (1969), twenty five percent of respondents with the highest total scores and also twenty five percent of the respondents with the lowest total scores were taken as the criterion groups for evaluating individual statements. The t values for the statements were calculated as:

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum(X_H - \bar{X}_H)^2 + \sum(X_L - \bar{X}_L)^2}{n(n-1)}}$$

Where, $\sum(X_H - \bar{X}_H)^2 = \sum X_H^2 - \frac{(\sum X_H)^2}{n}$;

$$\sum(X_L - \bar{X}_L)^2 = \sum X_L^2 - \frac{(\sum X_L)^2}{n}$$

\bar{X}_H = the mean score on a given statement for the high group

\bar{X}_L = the mean score on a given statement for the low group

n = total number of subjects

Only those statements with significant t values ($t > 1.75$) were retained and incorporated in the final scale. Thus, the final scale to measure quality orientation consisted of 15 statements.

Validity and reliability of the scale: Content validity of the measuring instrument was established through a panel of twenty five experts comprising of senior and principal scientists, research managers, and administrators. Following Samanta (1977) each statement of the measuring scale was administered to the group of experts with two response categories, namely, agree and disagree. The experts were asked to respond in either of the two categories based upon their perception whether the statement could relate to the particular area of investigation or not. Statements having 20% rejection rate were considered for exclusion from the final scale, although none of the statements were found to have a rejection rate of 20% or above. In order to test the internal consistency reliability, the scale was pretested by applying split-half technique with thirty non-sample respondents and the coefficient of internal consistency obtained was 0.88.

Scoring technique of the scale: In the final scale, each item was provided with 5 response categories, namely,

strongly disagree, disagree, undecided, agree, and strongly agree. The relative weightage assigned for the said categories was 0, 1, 2, 3 and 4 respectively for the favourable statements and the reverse for the unfavourable statements.

RESULTS AND DISCUSSION

Following the necessary steps as elaborated above, the quality orientation scale was derived that has been given below. The results obtained in measuring the level of quality orientation among the scientists of different cadres belonging to the two differently performing institutes have also been discussed below.

The *t* values obtained for the 24 quality orientation statements ranged from 0.24 to 4.28. A total of 15 statements were found to have significant *t* values (>1.75) (Table 1). Thus, the final scale consisted of 15 statements of which 8 statements were favourable and remaining 7 were unfavourable statements (Table 2).

The data in Table 3 indicated the extent of concern agricultural scientists from the two different institutes

had shown for maintaining high quality in their scientific activities. As compared to only 6% of total number of scientists from the LPI, notably larger proportion (38%) of them from the HPI had higher quality orientation. The level of quality orientation was high for little above one fifth (22%) of the pooled sample. Whereas, more than half (54%) of the agricultural scientists from the LPI had fallen in the low quality orientation group, the percentage was found to be much lower (12%) in case of agricultural scientists from the HPI falling in the same group. Thus, about one third (33%) of the pooled sample was found to have low level of quality orientation. Forty percent of agricultural scientists from the LPI, exactly half (50%) of the total number of agricultural scientists from the HPI, and a little less than half (45%) of the pooled sample was found to have medium level of quality orientation.

The study further showed that as compared to more than one third (38%) of Senior Scientists of the HPI, only 1.43% of Associate Professors from the LPI had high quality orientation. A majority (60%) of the

Table 1: Statements related to quality orientation and their *t*-values

Statement	<i>t</i> value
I always finish my tasks with self imposed standard of excellence.	2.28*
I don't bother maintaining high quality when I have to finish a number of tasks within a short period of time.	1.54
I never compare my current performance with the previous one.	2.01*
By and large, I always feel that there is a scope for improvement in work.	2.37*
I don't think over the years my performance standard has been increasing.	1.99*
I don't like to waste time by engaging myself in a single task for a long period of time.	1.00
I review and incorporate suggestions as quick as I receive them from my higher authority.	0.3
I am a keen observer and I always take care for minute details of activities, I undertake.	4.28*
I don't have a tendency to compete with others and other departments.	2.21*
I often miss deadlines in order to further enhance quality.	2.31*
I get offended by corrections and criticisms made about my work.	2.31*
I keep working unless and until I obtain the most desired result.	1.15
Somehow my performance standard has been decreasing over the years.	2.00*
I am well recognized in my organization for the quality of task that I accomplish.	0.43
I have the ability to look at the data and come out with a new interpretation.	1.83*
I make no compromise with the quality even if higher expenses are involved in maintaining so.	0.4
I have a well conceived plan of work, performance, and output for the entire year.	1.88*
I try to reach the quality standard whatsoever set by the higher authority.	0.69
I always strive for unique accomplishment	2.27*
I am obsessed with routine and lack reflection.	1.83*
I often restate the problem and see it from a different angle.	1.81*
I strive for perfection as long as finishing my tasks.	0.24
I think that my performance standard has been maintained at the same level over the years.	1.99*
People refer to my works as quality standards.	0.46

* *t* values are significant (>1.75)

Table 2: The Quality orientation scale

Statement	Nature
I am a keen observer and I always take care for minute details of activities, I undertake.	+
I get offended by corrections and criticisms made about my work.	-
By and large, I always feel that there is a scope for improvement in work.	+
I don't have a tendency to compete with others and other departments.	-
I always finish my tasks with self imposed standard of excellence.	+
I often miss deadlines in order to further enhance quality.	-
I always strive for unique accomplishment.	+
I never compare my current performance with the previous one.	-
I think that my performance standard has been maintained at the same level over the years.	+
I don't think over the years my performance standard has been increasing.	-
I have the ability to look at the data and come out with a new interpretation.	+
I am obsessed with routine and lack reflection.	-
I have a well conceived plan of work, performance, and output for the entire year.	+
Somehow my performance standard has been decreasing over the years.	-
I often restate the problem and see it from a different angle.	+

+ favourable statements; - unfavourable statements

Associate Professors from the LPI had lower level of quality orientation which was also prevalent among 16% of Senior Scientists from the HPI. Senior Scientists of the HPI were predominantly (46%) medium in terms of their quality orientation. Medium level of quality orientation was prevalent among 38.57% of Associate Professors from the LPI.

It can further be implied from Table 3 that as against 38% of Principal Scientists from the HPI only 16.67% of Professors from the LPI had higher level of quality orientation. Lower level of quality orientation was observed among as high as forty percent of the Professors from the LPI as against only 8% of Principal Scientists from the HPI. Quality orientation was of medium level for over half (54%) of the Principal Scientists from the HPI. Percentage of Professors from the LPI having medium level of quality orientation was found to be 43.33.

Among the four different cadres of scientists from the two institutes under study, the highest and the lowest concern over quality was shown respectively by Principal Scientists of the HPI and Associate Professors of the LPI as indicated by their respective mean scores obtained upon the variable (Table 4). The mean score in quality orientation obtained by the Principal Scientists of the HPI was 40.32. The Senior Scientists from the HPI also had obtained considerably high mean score (39.66) in quality orientation. In this regard, the Professors and Associate Professors of the LPI on an average had secured a mean score of 35.53 and 31.77 respectively.

A one way analysis of variance yielded a highly significant F value [$F(3,196) = 32.5, p < .001$] depicting that there was statistically reliable variation among the different groups of agricultural scientists under study with respect to their quality orientation.

Table 3: Distribution of respondents from LPI and HPI according to their level of quality orientation (N=200)

Degree of quality orientation	Frequency (f) and Percentage (%)						Pooled sample (N=200)
	LPI			HPI			
	Associate Professor (n ₁ =70)	Professor (n ₂ =30)	Total (N ₁ =100)	Senior Scientist (n ₃ =50)	Principal Scientist (n ₄ =50)	Total (N ₂ =100)	
Low (<33.15)	42 (60%)	12 (40%)	54 (54%)	8 (16%)	4 (8%)	12 (12%)	66 (33%)
Medium (33.15-41.05)	27 (38.57%)	13 (43.33%)	40 (40%)	23 (46%)	27 (54%)	50 (50%)	90 (45%)
High (>41.05)	1 (1.43%)	5 (16.67%)	6 (6%)	19 (38%)	19 (38%)	38 (38%)	44 (22%)

Table 4: Calculated F values depicting significance of variation in quality orientation among the groups of respondents (N=200)

Cadre	N	Mean	SD	F
Associate Professor, LPI	70	31.77	4.87	32.5 with (3,196) df at .000
Professor, LPI	30	35.53	5.95	
Senior Scientist, HPI	50	39.66	5.98	
Principal Scientist, HPI	50	40.32	5.07	
Pooled sample	200	36.44	6.53	

CONCLUSION

The present study focuses on construction of a suitable measuring instrument in order to find out the level of quality orientation prevalent among the agricultural scientists. The results obtained in course of the study further enunciate whether the different cadres of agricultural scientists vary in terms of their quality orientation or not. This is evident from the study that quality orientation among agricultural scientists varied not only across cadres but also from institute to institute. As a considerably high proportion of scientists from the LPI had shown only a little concern over quality, the study suggests intervention both at institutional as well as individual level to enhance the level of quality orientation. Intense scientific networking, quality based incentives and a much more refined quality based performance appraisal system will help in enhancing quality orientation among the scientists.

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Analytical Study of Contract Farming System in Punjab

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ABSTRACT

A study was undertaken in Punjab to analyse farmer's perception regarding contract farming and the related constraints. It has been found that majority of the respondents were innovative, they had the ability to take risk and they were very economically motivated for starting contract farming because of secured returns and more income as stated in the agreement. Majority of the respondents agreed with quantity of the seeds and availability at right time, quality of fertilizers as input provided in the agreement. There were a mix response regarding the quality of seeds, quality of pesticides and the availability of technical know-how. Majority of the respondents disagreed with the market support and payment for produce as a provision in the agreement. The main problems faced by the respondents were the strict grading practices, non-marketing of the produce, non-numerative prices fixed by the contract agencies and late payment. Similarly, major problem faced by the contract agencies was negative attitude of the farmers towards contract farming. The majority of the respondents suggested that there should be an arrangement for assured procurement and at fixed rate and quality standards should be fixed at the time of agreement.

Keywords: Contract farming, Punjab

INTRODUCTION

The present scenario of Punjab agriculture is the monoculture involving wheat-rice rotation, the state of Punjab has the highest concentration of these two crops. Extensive coverage under this system disturbed the ecosystem of the Punjab state particularly water balance and soil health. The major problems faced by the farmers require intervention of four important issues: price assurance, assured product marketability, elimination of intermediaries in the market and timely availability of production credit. In order to increase the income per unit area and to maintain ecological balance in the agro ecosystem, there is urgent need to diversify the cropping pattern by the introduction of non-conventional crops like winter maize, sarson (hyola), barley, basmati rice, sunflower, mint etc. To achieve this, there is need to provide infrastructure in the form of cultivation technology, marketing facility and post harvest technology to raise these high value and labour intensive crops. One of the best methods to achieve this is the contract farming. It is an intermediate institutional arrangement that allows agro-processing firms to participate in and exert control over the production process without owning or operating the farms. In

essence, contract farming is a demand/market driven phenomenon unlike traditional farming that first produce a commodity and then looks for its market. In its most extended form, contract farming is nothing but an extension of the phenomenon of global sourcing wherein an agro-processing firm can produce anything anywhere, by sourcing inputs from anywhere, to be sold in any market in the world (Singh, 2000).

In India, seed production has been carried out through contract farming by the seed companies quite successfully for more than four decades in the country. There are several agricultural and horticultural crops such as tomato, potato, chilli, baby corn, onions, cotton, basmati rice, flowers and medicinal plants etc., produced in some form of contractual arrangements with the farmers in India. Contract farming in Punjab was in place by early 1990's with the entry of Pepsi Foods- a multinational company (PepsiCo) subsidiary into tomato and chilli and a local firm, Nijjar Agro Food Ltd. into tomato. In Punjab, the State Government has argued that contract farming is the best means of crop diversification, in a region where there is a real question of ecological survival and sustaining natural resources like water and soil in reasonably healthy state. To give

boost to the diversification of agriculture in Punjab, the Government of Punjab has also started contract farming scheme through Punjab Agro Food grains Corporation Limited (PAFC). To know about this agribusiness, an important component for diversification of rice-wheat cropping pattern, an 'Analytical study into contract farming' was undertaken with the following objectives.

1. To study the farmers' reactions regarding different aspects of contract farming.
2. To study the problems faced by the farmers under contract farming system.
3. To study the suggestions given by the farmers for improving contract farming scheme in future.

MATERIALS AND METHODS

The study was conducted in Punjab state. District wise list of farmers adopting contract farming was prepared. Five districts namely, Amritsar, Faridkot, Patiala, Bathinda and Mansa with maximum number of contract farmers were selected for the study. From the list prepared a sample of 200 farmers were selected proportionately to total number of contract farmers in five selected districts of Punjab as the respondents of the study. Likert method of scale construction was used for construction of innovativeness, risk orientation and economic motivation scales. The reactions of the farmers employed the favourable/unfavourable values attached to the different aspects of the agreement under contract farming like provision of inputs and production services, access to credit, introduction of appropriate technology, skill transfer, guaranteed and fixed pricing structure, access to reliable markets. Farmers' reactions were measured in term of agreement, partial agreement and disagreement.

Data was collected through structured and open ended questions. It was measured by ranking the various problems from one to seven. Rank one implying to the problem faced by maximum number of the farmers and rank seven implying to the problem faced by minimum number of the farmers. The rank were converted into scores, such as rank one has given score seven and rank seven has given score one accordingly. Later on, scores for each problem were aggregated and mean score was calculated. Higher the mean value for the problem showed its importance.

For the improvement of any new venture, it is very important to have suggestion of the farmers who have

concerned with it. This aspect of investigation has been summed up as multiple responses of the farmers. An interview schedule was constructed for collecting information from the farmers. The interview schedule was pre-tested on 60 non-sampled respondents. On the basis of information obtained, necessary modifications were made in the final interview schedule. The data were collected from 200 farmers of selected five district of Punjab through personal interview technique.

RESULTS AND DISCUSSION

The personal characteristics of the respondents such as age, education, operational land holding, operational area under contract farming were taken as independent variables and information about these aspects have been given in Table 1. The respondents were classified into four age groups by using cumulative cube root method. The data indicated that 80.00 per cent of the farmers above the age of 35 years engaged in contract farming. The educational level of the respondents varied from primary to postgraduate. Majority of them possessed middle and matric level of qualification. Similarly, only 15.00 per cent and 6.00 per cent of the respondents were graduates and post-graduates, respectively. Based on the data about operational land holding and operational area under contract farming the respondents were grouped into four categories by using cumulative cube root method (Singh, 1975). The findings revealed that majority (>70.00 per cent) of the respondents operated on 2-15 acres and 15-31 acres of land. Similarly, operational area under contract farming was split into five categories. More than 75.00 per cent of the respondents had 1-5 acres and 5-9 acres operational area under contract farming.

These three variables were very important for starting any new venture like contract farming. It was adopted by those farmers who were relatively earlier in adopting the contract farming as compared to other, had courage to face the problems in contract farming and a relative value they placed on economic ends. The data in Table 1 indicated that 63.50 per cent of the respondents were highly innovative, 29.50 per cent fell in low category and 7.00 per cent of the respondents fell in medium category respectively. Similarly, 68.00 per cent of the respondents fell in high level of risk orientation, 26.00 per cent in low level and 6.00 per cent in medium level category, respectively. Again, majority of the respondents i.e. 85 per cent was highly motivated and fell in high level of economic motivational category.

Table 1: Distribution of the respondents according to their socio-personal characteristics

S.No.	Characteristics	Category	Respondents	
			Frequency	Percentage
1.	Age (yrs)	26-35	41	20.50
		35-44	66	33.00
		44-53	39	19.50
		>53	54	27.00
2.	Education	Middle	69	34.50
		Matric	89	44.50
		Graduate	30	15.00
		Postgraduate	12	6.00
3.	Operational land holding (acres)	2-15	84	42.00
		15-31	65	32.50
		31-54	37	18.50
		>54	14	7.00
4.	Operational area under contract (acres)	1-5	104	54.00
		5-9	49	24.50
		9-17	27	13.50
		>17	16	8.00
5.	Innovativeness	Low level	59	29.50
		Medium level	14	7.00
		High level	127	63.50
6.	Risk orientation	Low level	52	26.00
		Medium level	12	6.00
		High level	136	68.00
7.	Economic motivation	Low level	13	6.50
		Medium level	17	8.50
		High level	170	85.00

The reactions of the respondents regarding different aspects of contract agreement were measured in terms of agreement, partial agreement and disagreement. The aspects of agreement included inputs provided, extension services, provision of credit, technical know-how, marketing support and payments. The information about this has been given in Table 2, the majority of the respondents i.e. 71.50 per cent agreed about the quantity of seeds provided by the contract agencies whereas, 25.00 per cent and 3.50 per cent of the respondents partially agreed and disagreed about quantity of the seeds. The similar results were in case of the quality of the seeds and quality of fertilizers. Again, 83.50 per cent of the respondents agreed about the availability of seeds at right time and 16.50 per cent of them partially agreed on this aspect. About half of the respondents were having agreement about quality of pesticides but 28.50 per cent and 15.50 per cent of respondents had partial agreement and disagreement, respectively about the quality of pesticides.

It is apparent from the data that 53.50 per cent of the respondents showed agreement with timeliness of

extension services given by contract agencies and 32.50 per cent and 14.00 per cent of them had partial agreement and disagreement. The data revealed that all the respondents reported disagreement with credit provision and 42.50 per cent of them were agreed with technical know-how provided by contract agencies 34.50 and 23.00 per cent of the respondents had partial agreement and disagreement with technical know-how respectively. The partial agreement and disagreement with marketing support was indicated by 48.00 and 32.00 per cent of the respondents, respectively. The respondents complained about the grading based pricing used by the agencies. Majority of the respondents i.e. 80.00 per cent disagreed with payment for purchase whereas, 19.00 per cent of them partially agreed with payment system. The payments of produce were made by final buyer to the contract agencies, the agencies to PAFC, PAFC to District Manager at each district and they issued cheques to the farmers. Obviously, it was time consuming process and delayed the payment to the farmers and eroded their confidence. The study findings are supported by Chawla, (2002).

Table 2: Distribution of the respondents according to farmers' reaction regarding different aspects of contract agreement

S.No.	Aspects	Farmers' reactions		
		Agree	Partially Agree	Disagree
1.	Input Provided			
	i) Quantity of seeds	143 (71.50)	50 (25.00)	7 (3.50)
	ii) Quality of seeds	125 (62.50)	55 (27.50)	20 (10.00)
	iii) Availability of seeds at right time	167 (83.50)	33 (16.50)	—
	iv) Quality of fertilizers	158 (79.00)	36 (18.00)	6 (3.00)
	v) Quality of pesticides	112 (56.00)	57 (28.50)	31 (15.50)
2.	Timeliness of advisory services	107 (53.50)	65 (32.50)	28 (14.00)
3.	Provision of credit	—	—	200 (100.00)
4.	Availability of technical know-how	85 (42.50)	69 (34.50)	46 (23.00)
5.	Marketing support	40 (20.00)	96 (48.00)	64 (32.00)
6.	Payments of produce without unnecessary delay	2 (1.00)	38 (19.00)	160 (80.00)

Figures in parentheses indicate percentages

Table 3: Rank accorded to problems faced by the respondents while interacting with contract agencies n=200

Rank accorded by respondents	Problems						
	Grading practices (f)	Marketing of produce (f)	Non-numerative price (f)	Late payment (f)	Costly and low quality input (f)	Lack of financial aid (f)	Lack of extension services (f)
1.	158	42	—	—	—	—	—
2.	39	139	22	—	—	—	—
3.	3	19	144	14	20	—	—
4.	—	—	32	151	11	4	2
5.	—	—	2	18	131	39	10
6.	—	—	—	8	20	99	73
7.	—	—	—	9	18	58	115
Aggregate score	1355	1223	986	753	595	389	299
Mean score	6.78	6.12	4.93	3.77	2.18	1.95	1.50
Overall rank	I	II	III	IV	V	VI	VII

The responses of the respondents regarding the problems faced in contract farming are presented in Table 3. The respondents ranked 1 to the problem of grading and standardization (mean score 6.78) while dealing with contract agencies. Farmers got less price as farmers were not able to meet grading requirement, thus their net return reduced and showed discontentment among them. The respondents reported as no. 2 to the problem of marketing of their produce (mean score 6.12) due to high quality specification. The respondents complained about the way of contract farming practices being held by contract agencies and PAFC. PAFC did not inform in advance about quality specification of produce. The study findings are supported by Ghosh (2003). The respondents also faced problem of non-numerative price fixed by contract

agencies after grading their produce and ranked it third in order. Similarly, the problem of late payment and costly and low quality input with mean score 3.77 and 2.18 were ranked fourth and fifth. The promised yield results reported by the contract agencies could not achieved which led to losses to the farmers. The respondents ranked sixth and seventh to lack of financial aid and lack of extension services, respectively. The findings are supported by Barwale (1985), Btaoile and throat (1987), Chatterjee (2004), Dhesi (1988), Kaur *et al.* (1989), Sharma and Singh (2001).

At the same time we had also noted the problems faced by the contract agencies while dealing with the farmers. A separate open ended questionnaire was developed accordingly. The responses of the contract

agencies regarding problems faced by them while dealing with the farmers are presented in Table 4. Farmers' negative attitude towards contract farming is one of the biggest problems, which was ranked first by the companies.

Table 4: Problems faced by the contract agencies while dealing with farmers

Characteristics	Rank of problems
Farmers' negative attitude towards contract farming	1
Land holding	2
Extra contractual activities	3
Marketing and technical assistance	4
Social cultural constraints	5

A number of situations could lead to farmers' dissatisfaction like late payments, inefficient extension service, unreliable transportation for crops and management's rudeness to farmers, all normally generated dissent; as a result the farmers withdrew the projects. Land issue was difficult to address specially, people cultivated land of their relatives. Farmers must have suitable land to cultivate their contracted crops. Problems could arise when farmers had minimum or no security of tenure as there was a danger of sponsors' investment being wasted as a result of farmer landlord disputes. An extra contractual sale was another big problem which was always seen and was not easy to control when an alternative market existed. Thus, it was difficult for the sponsors to regulate production targets

Table 5: Suggestion of the respondents for improving the contract farming system (n=200)

Suggestions	Frequency#	Percentage
Assured procurement at fixed rates	200	100.00
Quality standards should be fixed at the time of agreement	169	84.50
Quality seeds should be provided	79	39.50
Quality extension services should be provided	129	64.50
Facility of credit should be provided	99	49.50
Insurance of the crops	105	52.50
Payment for purchase without unnecessary delay	181	90.50

Multiple response

and quality aspects. Marketing and technical assistance was fourth important problem faced by agencies; a project became very difficult to manage when farmers' diverted technical assistance to other crops. Promoting agriculture through contract farming would reduce the ownership. Farmers insisted on growing crops of last season as seeds for next crop instead of buying new seeds from contracting agencies.

This aspect of investigation was well taken care off and information about this had been given in Table 4. The information presented in this Table 4, showed that all the respondents suggested that there should be an arrangement for assured procurement at fixed rate and 84.50 per cent of them suggested that the quality standards should be fixed at the time of agreement. More than 90.00 per cent of the respondents proposed that payment of produce should be given without unnecessary delay. The other suggestions accorded were quality of extension services at right time, crop insurance and facility of credit and provision of quality seeds at right time.

CONCLUSION

It has been concluded that majority of the respondents were innovative, they had the ability to take risk and they were very economically motivated for starting contract farming because of secured returns and more income as stated in the agreement. Majority of the respondents agreed with quantity of the seeds and availability at right time, quality of fertilizers as input provided in the agreement. There were a mix response regarding the quality of seeds, quality of pesticides and the availability of technical know-how. Majority of the respondents disagreed with the market support and payment for produce as a provision in the agreement. The main problems faced by the respondents were the strict grading practices, non-marketing of the produce, non-numerative prices fixed by the contract agencies and late payment. Similarly, major problem faced by the contract agencies was negative attitude of the farmers towards contract farming. Other problems faced by the agencies were the land disputes, extra contractual activities and social constraints as the farmers did not buy new seed every time. The majority of the respondents suggested that there should be an arrangement for assured procurement and at fixed rate and quality standards should be fixed at the time of agreement.

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Problems Faced By Maize Growers of Udaipur District

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ABSTRACT

The study was conducted in four villages of three Panchayat Samities of Udaipur district by personal interviewing 80 trained and 80 untrained maize growers. Ecological constraints were the major constraints perceived by the maize growers followed by post-harvest technology, plant protection measures, marketing problems, chemical control of weeds, soil treatment and fertilizer application, method of sowing, seed rate and time of sowing, seed treatment and improved seed. At overall level, constraints faced by the trained respondents were less as compared with untrained respondents. KVK., Udaipur should arrange training programmes to reduce the gap and other concerned agencies should also take action in this regard.

Keyword: Maize, Adoption, Constraints

INTRODUCTION

Maize (*Zea mays*) or Indian corn is the world's fourth leading cereal. Maize is the most important and major crop of Udaipur district. It covers 1,73,614 lakh hectares of land. The importance of this crop is many folds, as it is being used as food, fodder and industrial purpose. *Krishi Vigyan Kendra* of Udaipur district is engaged in promoting scientific agriculture in their area for more than a decade. It is, therefore, important to know as to how far KVK has been able to promote knowledge level and adoption of improved cultivation practices of maize in respective areas. Maize being major crop in *kharif* season in Udaipur district, adoption of improved practices of maize crop production technology will give sufficient evidence of success achieved by the KVKs. The present study was conducted to know the constraints faced by the trained and untrained farmers which will help to increase adoption of recommended package of practices of maize. The study was conducted with two objectives.

1. To study the problems perceived by the trained and untrained maize growers in adoption of improved maize cultivation practices.
2. To know practicewise suggestions given by the maize growers for overcoming the constraints in adoption of maize cultivation.

MATERIALS AND METHODS

The study was conducted in four villages of three

panchayat samities of Udaipur district where training was conducted. The 80 trained farmers from KVK were interviewed. Equal number i.e. 80 maize growers who are untrained from adjoining villages were also interviewed. Total 160 maize growers were interviewed with specially designed interview schedule. Personal interview method was used for data collection. The data were analysed by using suitable statistical tools like percentage and ranking.

RESULT AND DISCUSSION

The problems perceived by the trained and untrained maize growers in adoption of improved maize cultivation practices are depicted in Table 1.

From Table 1, it is seen that in case of problems related to improved seed maize growers faced problems like poor maturity of grain due to insufficient winter rains' (45.04 per cent), 'taste of produce is not good' and 'unavailability of seed in/around village' (35.04 per cent). In case of soil treatment, 'unable to bear risk' (70.00 per cent), 'costly chemical' (62.33 per cent), 'lack of finance' (58.47 per cent), 'lack of knowledge' (50.26 per cent) and 'doubtful about utility' (48.59 per cent) were the major problems. Regarding seed treatment 'non availability of chemicals in time' (36.05 per cent) was the major problem faced by maize growers. Problems related to sowing like 'lack of special equipment for sowing' (58.70 per cent), 'lack of confidence in recommended seed rate' (56.06 per cent),

Table 1: Problems perceived by trained and untrained respondents in adoption of maize cultivation practices

S.No. Problems	Trained (N=80)		Untrained (N=80)		Overall (N=160)	
	Percent	Rank	Percent	Rank	Percent	Rank
A. Related to improved seed						
1. Grain do not mature due to insufficient winter rains	45.28	I	44.80	II	45.04	I
2. Taste of produce is not good	37.66	II	47.19	I	42.42	II
3. Unavailability of seed in/ around village	31.00	IV	39.08	III	35.04	III
4. Inadequate irrigation facility	29.87	V	35.28	IV	32.57	IV
5. Lack of finance for input	32.40	III	30.52	V	31.46	V
6. Seed is costly	29.52	VI	28.09	VI	28.80	VI
7. Seed do not available in required quantity	28.12	VIII	26.71	VII	27.41	VII
8. Most susceptible to pest and diseases	23.38	VII	21.95	IX	22.66	VIII
9. H.Y.V is not bold seeded	17.66	IX	23.85	VIII	20.75	IX
B. Related to soil treatment						
1. Unable to bear risk	66.45	I	73.55	II	70.00	I
2. Costly chemicals	47.15	II	77.51	I	62.33	II
3. Lack of finance	43.85	III	73.10	III	58.47	III
4. Lack of knowledge	28.12	V	72.40	IV	50.26	IV
5. Doubtful about utility	40.47	IV	56.71	V	48.59	V
C. Related to seed treatment						
1. Non availability of chemicals in time	29.31	III	42.80	II	36.05	I
2. Difficult method	21.03	VI	44.59	I	32.81	II
3. Lack of knowledge of seed treatment	38.71	I	24.76	IV	31.73	III
4. Lack of knowledge of technique of seed treatment	31.13	II	31.32	V	31.22	IV
5. Unavailability of seed dresser in area	14.25	IV	38.42	III	26.33	V
6. Certified seed was not used	21.09	V	24.85	VI	22.97	VI
D. Related to sowing aspect						
1. Lack of special equipment for sowing	57.82	I	59.59	III	58.70	I
2. Lack of confidence in recommended seed rate	50.11	II	62.02	II	56.06	II
3. Priority given to sowing of other crops	28.09	IV	72.80	I	50.44	III
4. More incidence of insect pest	32.21	III	42.32	IV	37.26	IV
5. Lack of knowledge about recommended seed rate	27.59	V	38.14	V	32.86	V
6. Lack of knowledge about proportion of intercropped seeds	23.85	VI	39.04	VI	29.44	VI
7. Delay planting reduces the yield	21.95	VII	31.90	VII	26.92	VII
E. Related to fertilizer application						
1. High cost of fertilizers	55.85	I	75.98	I	65.91	I
2. Lack of credit facility	51.22	II	71.36	II	61.29	II
3. Fertilizers were not available in time	41.47	III	69.96	III	55.71	III
4. Inadequacy of organic manure	38.80	V	69.14	IV	53.97	IV
5. More labourers are required	40.49	IV	66.29	V	53.39	V
6. Inadequate irrigation facility	26.09	VI	64.88	VI	45.48	VIII
F. Related to chemical control of weeds						
1. Complex method	60.11	II	70.95	II	65.53	I
2. Unavailability of chemicals	58.59	III	63.80	IV	61.19	II
3. Risky method	47.25	VI	71.90	I	59.57	III
4. Small landholding	57.19	IV	61.85	V	59.52	IV
5. Hazardous to crop	49.57	V	68.38	III	58.97	V
6. High cost involved	63.80	I	53.57	VI	58.68	VI
7. Labour are shortage	42.60	VII	57.38	VII	49.99	VII
8. Lack of knowledge	21.12	VIII	46.71	VIII	33.91	VIII

Table 1 contd.....

S.No. Problems	Trained (N=80)		Untrained (N=80)		Overall (N=160)	
	Percent	Rank	Percent	Rank	Percent	Rank
G. Related to plant protection measures						
1. Hazardous to men	53.35	II	74.47	II	63.91	I
2. Needs special equipment	55.76	I	71.12	III	63.44	II
3. Lack of knowledge	51.95	III	70.25	IV	61.10	III
4. Harmful residual affect	46.00	IV	76.01	I	61.00	IV
5. Chemicals were not available	45.23	V	65.07	V	55.15	V
6. Lack of capital	34.85	VI	50.00	VI	42.42	VI
H. Related to ecological						
1. Untimely rains	60.85	III	70.70	I	65.77	I
2. Occasionally heavy rains	63.54	I	67.44	III	62.49	II
3. Cloudy weathers & high temperature at the flowering stage	51.47	IV	68.36	II	59.91	III
4. More attack of insect pest due to heavy rains	61.91	II	56.28	V	59.09	IV
5. Erratic rainfall	50.22	V	55.28	VI	52.75	V
6. Long dry spell	32.36	VI	62.68	IV	47.52	VI
I. Related to post harvest technology						
1. Inadequate storage facility	61.23	II	73.08	I	67.15	I
2. Fumigants do not available easily	63.38	I	67.36	IV	65.37	II
3. Not convinced about utility of fumigants	54.33	III	71.47	II	62.90	III
4. Produce not enough for storage	41.62	IV	69.86	III	55.74	IV
5. Complex method of storage	29.63	V	55.41	VI	42.52	V
6. Lack of technical guidance	22.42	VI	61.21	V	41.81	VI
J. Related to marketing						
1. Incorrect weight & measurement by the businessmen	58.61	I	70.36	VI	64.48	I
2. Bounded by local businessmen due to advance payment or debt	50.29	IV	75.63	I	62.96	II
3. Unnecessary deductions	48.61	V	76.13	II	62.37	III
4. Lack of support of cooperative society	51.68	III	71.20	V	61.44	IV
5. Low price just after harvesting	56.71	II	62.85	VII	59.78	V
6. Difficult to sell produce in interior areas at appropriate rate	45.36	VI	72.35	IV	58.85	VI
7. Lack of encouragement by Govt. to establish mill at cooperative level	48.62	VII	68.25	VIII	58.43	VII
8. Low price of higher quality product	39.57	VIII	74.95	III	57.26	VIII
9. Lack of knowledge about procurement	29.09	IX	69.23	VI	49.16	IX

'priority given to sowing of other crops' (50.44 per cent) were perceived by the maize growers. In case of fertilizers application problems like 'high cost of fertilizers' (65.91 per cent), 'lack of credit facility' (61.29 per cent), 'fertilizers were not available in time' (55.71 per cent), 'sufficient organic manure' (53.97 per cent), 'more labour is required' (53.39 per cent) and 'inadequate irrigation facility' (45.48 per cent) were found. Problems related to chemical control of weeds viz. 'complex method' (65.53 per cent), 'unavailability of chemical' (61.19 per cent), 'risky method' (59.57 per cent), 'small landholding' (59.52 per cent), 'hazardous

to crop' (58.97 per cent), 'high cost involved' (58.68 per cent), 'labour shortage' (49.99 per cent) were perceived. In case of problems related to plant protection measures, 'hazardous to men' (63.91 per cent), 'need special equipment' (63.44 per cent), 'lack of knowledge' (61.10 per cent), 'harmful residual affect' (61.00 per cent), 'chemicals were not available' (55.15 per cent) were the major problems. Problems related to ecology like 'untimely rains' (65.77 per cent), 'occasionally heavy rains' (62.49 per cent), 'cloudy weather and high temperature at the flowering stage' (59.91 per cent), 'more attack of insect pest due to heavy rains' (59.09

Table 2. Suggestions given by the maize growers in the adoption of maize cultivation

S.No. Suggestions	Trained (N=80)		Untrained (N=80)		Overall (N=160)	
	Percent	Rank	Percent	Rank	Percent	Rank
A. Related to improved seed						
1. Quality seed should be provided having good taste and keeping quality.	48.75	I	47.50	I	48.13	I
2. Seed may be made available in the village itself	43.75	II	42.50	III	43.13	II
3. Adequate irrigation facilities should be made available in the village.	40.00	III	46.25	II	43.13	III
4. Finance for input should be made available in the villages through finance supplying institution.	28.75	IV	32.50	IV	30.62	IV
5. Seed should be made available at reasonable rate	28.75	V	32.50	V	30.62	V
6. Sufficient quantity of seed should be available by supplying agencies.	27.50	VI	26.50	VII	26.88	VI
7. Pest and disease resistant variety may be developed.	26.50	VII	27.50	VI	26.88	VII
8. Bold size seed should be available by Agril. University	22.50	VIII	23.75	VIII	23.13	VIII
B. Related to soil treatment						
1. Chemicals should be made available at reasonable rates	53.15	I	61.25	II	57.50	I
2. Technical knowledge should made available	48.75	II	63.75	I	56.25	II
C. Related to seed treatment						
1. Inputs required for seed treatment should be made available in the village at reasonable rate.	33.75	II	47.50	I	40.63	I
2. Practical technical knowledge of seed treatment be given.	37.50	I	30.00	II	33.75	II
3. Seed dresser be made available at lower rate in the villages	23.75	III	30.00	III	26.88	III
D. Related to sowing aspect						
1. Technical information about recommended seed rates and about sowing be given.	48.75	II	57.50	I	53.13	I
2. Suitable equipment be made available at reasonable rates in the villages.	52.50	I	53.75	II	51.87	II
3. Practical knowledge about intercrops is given.	37.50	III	36.25	III	36.87	III
4. In case of delayed sowing, information about remedies be communicated.	32.50	IV	26.25	IV	29.38	IV
E. Related to fertilizer application						
1. Chemical fertilizers should be made available at reasonable rates in the villages	50.00	I	61.25	I	55.62	I
2. Credit providing institutions made be available in villages	47.50	II	52.50	II	50.00	II
3. Fertilizer should be made available at proper time by concerned agencies.	45.00	III	52.50	III	48.75	III
4. Organic fertilizers in sufficient quantity should be available in village	38.75	IV	36.25	IV	37.50	IV
5. Proper irrigation facilities be made available in the villages.	26.25	V	22.50	v	24.37	V
F. Related to chemical control of weeds						
1. In depth technical knowledge on recommended control measure of weed be given.	50.00	I	57.50	I	53.75	I
2. Weedicides should made available at reasonable rates in the village.	47.50	II	57.50	II	52.50	II
3. Demonstrations on such aspects be organized in the villages.	30.25	III	33.75	III	35.00	III
G. Related to plant protection measures						
1. In depth technical knowledge on recommended plant protection measures should be given to the farmers.	73.75	I	77.50	II	75.63	I

Table 2: contd.....

S.No.	Suggestions	Trained (N=80)		Untrained (N=80)		Overall (N=160)	
		Percent	Rank	Percent	Rank	Percent	Rank
2.	Inputs of plant protection measures should be made available at reasonable rates in the villages.	70.00	II	78.75	I	75.38	II
3.	Equipments should be made available at reasonable rates.	60.00	III	51.25	III	55.62	III
4.	Finance should be made available at reasonable interest rate.	40.00	IV	37.50	IV	38.75	IV
H.	Related to ecology						
1.	Timely information about rainfall prediction be given.	42.50	I	48.75	I	45.63	I
2.	Irrigation facilities should be made available.	40.00	II	36.25	II	38.13	II
I.	Related to post harvest technology						
1.	Sufficient storage facilities should be made by Govt.	62.50	I	54.67	I	65.00	I
2.	Fumigants be made available in the villages at reasonable rate.	51.25	III	47.50	II	49.38	II
3.	Technical guidance begivenon this aspect	53.75	II	41.25	III	47.50	III
J.	Related to marketing problems						
1.	Obstacle of middlemen should be removed.	73.75	I	82.50	III	78.13	I
2.	Co-operative movement be increased in the village.	65.00	II	86.25	II	75.00	II
3.	Farmer should get reasonable rates for his produce immediately.	60.00	III	86.25	I	73.13	III

per cent), 'erratic rainfall' (52.75 per cent), 'long dry spell' (47.52 per cent) were faced by maize growers. Problems related to post harvest technology like 'inadequate storage facility' (67.15 per cent), 'fumigants do not available easily' (65.37 per cent), 'not convinced about utility of fumigants' (62.90 per cent), 'produce not enough for storage' (55.74 per cent) were faced by the maize growers.

In case of marketing problems, 'incorrect weight and measurement by the businessmen' (64.48 per cent), 'bounded by local businessmen due to advance payment or debt' (62.96 per cent), 'unnecessary deductions' (62.37 per cent), 'lack of support of cooperative society' (61.44 per cent), 'low price just after harvesting' (59.78 per cent), 'difficult to sell product in interior areas at appropriate rate' (58.85 per cent), 'lack of encouragement by Govt. to establish mill at cooperative level' (58.43 per cent), 'low price of higher quality product' (57.26 per cent) and 'lack of knowledge about procurement' (49.16 per cent). In order to solve the above mentioned problems, maize growers suggested were perceived. The findings were similar with findings of Dhaka *et al.* (2010), Singh *et al.* (2007) Balasubrabma (2005) and Chandwant (2002). The practicewise suggestions given by the maize growers for overcoming the problems in the adoption of maize cultivation is given in Table 2.

In order to solve all the 'quality seed should be provided having good taste and keeping quality' (48.13 per cent), 'seed may be made available in the village itself' (43.13 per cent) and 'adequate irrigation facilities should be made available in the village' (43.13 per cent) 'chemicals should be made available at reasonable rates' (57.50 per cent) and 'technical knowledge should made available' (56.25 per cent), given by maize 'chemicals should be made available at reasonable rates' (40.63 per cent).

Maize growers quoted suggestions regarding sowing aspect like 'technical information about recommended seed rates and about sowing be given' (53.13 per cent) and 'suitable equipments be made available in reasonable rates in the villages' (51.87 per cent). Regarding fertilizer application maize growers opinioned that 'chemical fertilizers should be made available at reasonable rates in the villages' (55.62 per cent), 'credit providing institutions made available in villages' (50.00 per cent) and 'fertilizer should be made available at proper time by concerned agencies' (48.75 per cent).

Suggestions for chemical control of weed were 'in depth technical knowledge on recommended control measure of weed be given' (53.75 per cent) and 'weedicides should made available at reasonable rates in the village' (52.50 per cent). Suggestions about plant protection measures like 'in depth technical knowledge

on recommended plant protection measures should be given to the farmers' (75.63 per cent), 'inputs of plant protection measures should be made available at reasonable rates in the villages' (75.38 per cent) and 'equipment should be made available at reasonable rates' (55.62 per cent) were also provided. Suggestion on ecological aspect was 'timely information about rainfall prediction should be given' (45.63 per cent). Opinion about post-harvest technology given by the maize growers were 'sufficient storage facilities should be made by Government' (65.00 per cent), 'fumigants should be made available in the villages at reasonable rate' (49.38 per cent) and 'technical guidance be given on this aspect' (47.50 per cent).

Lastly the suggestions on marketing were 'obstacle of middlemen should be removed', 'co-operative movement be increased in the village' and 'farmer should get reasonable rates for his produce immediately' (73.13 per cent). The findings were similar with findings of Singh *et al.* (2007).

CONCLUSION

Among the ten constraints to ecological constraints were the major constraints perceived by the maize growers. This constraint was followed by constraints related to post harvest technology, plant protection measure and marketing problems respectively. While relatively lesser constraints perceived by them were chemical control of weeds, soil treatment and fertilizer application respectively. Least perceived constraints

were method of sowing, seed rate and time of sowing, seed treatment and improved seed. The overall constraints faced by the trained respondents were less as compared with untrained respondents. KVK, Udaipur should arrange training programmes to reduce the gap. Looking to suggestions offered by the respondents, the concerned agencies may take the necessary action to solve the problems of farmers in obstacle in adoption of recommended production technologies in many ways.

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Functioning of Fishing Cooperative Societies in Selected States of India

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ABSTRACT

In India and other developing countries, the role of institutional support and social connectedness among fishing communities is played by and large by conventional fishermen groups, fishermen cooperative societies, federations, etc. These organizations by their very nature and reason for existence are aimed at increasing the maximum output from the fishery resources and thereby, increasing the livelihood, income and wellbeing of their members. In India, fishing cooperative societies have been studied by very few researchers and most of these studies have focused on performance of fishing cooperatives on production, marketing and financial aspects. Fishing cooperative societies as a social organization have not adequately been studied in India. This paper reports findings from a study undertaken to assess the internal functioning of the fishing cooperative societies established and promoted under different scenarios. The study covered 58 fishing cooperative societies in three states viz. Himachal Pradesh, Madhya Pradesh and Uttar Pradesh.

Keywords: Fishing, Communities, Cooperative, Societies, Social organization

INTRODUCTION

The fishery co-operative movement in India began in 1913 when the first fishermen's society was organised under the name of 'Karla Machhimar Co-operative Society' in Maharashtra. The structure continued to grow into multi-functional units at the primary level, federations at district/regional, state and national levels (Malhotra and Sinha, 2007). In fisheries sector, in the developed countries (and some of the developing countries like Bangladesh, Philippines, etc.) several new groups and professional associations of fishing communities have emerged in recent two - three decades. In India and other developing countries, this role of institutional support and social connectedness among fishing communities is played, by and large, by conventional fishermen groups, fishermen cooperative societies, federations, etc (though there have been instances where fishing communities, on their own or with the help of some local Non-Government Organization, have acted in informal way outside the purview of formal cooperatives to achieve common good, particularly in the states like Kerala, Tamil Nadu, etc.). There are 17 State federations, 108 Central societies, 11,847 Primary societies of fisher folks having a membership of 19,17,305.

Most of the fishing cooperative societies have been established to coordinate production and marketing of fish harvests and to avail benefits of government schemes. Major part of the fishing cooperative movement in the country has been a state promoted initiative. There are, however, exceptions to this, for example, fishing cooperative societies organized and supported by some NGOs in southern states such as in Tamil Nadu and Kerala by South Indian Federation of Fish workers Societies (SIFFS); societies organized at Tawa reservoir and Bergi reservoir in M.P. by the Kisan Adivasi Sangthan and Bergi Bandh Visthapit Sangh, respectively.

In India, fishing cooperative societies have been studied by very few researchers (Singh and Dhar Choudhary, 1997; Bhatta, 1997; Nair and Singh, 1997; Rahim and Singh, 1997; Moorti and Chauhan, 1997; Deepak, 1998; Das, 1992; Singh and Bhattacharya, 1991; Chatterjee & Bandyopadhyay, 1990; Jyotishi and Parthasarathy 2007, Tyagi *et al.*, 2007 and Tyagi *et al.*, 2008). In most of the cases, the fishermen's cooperatives have been found successful and were able to retain the loyalty of their members. However, these organizations by their very nature and reason for existence have focussed on increasing the maximum

output from the fishery resources and thereby, increasing the livelihood, income and wellbeing of their members. Though there have been instances where these fisher folk organizations have played an important role in resource enhancement and management of fishery resources.

Most of these studies, barring a few recent ones, have been conducted by economists and focused on performance of fishing cooperatives on production, marketing and financial aspects. Performance of any user organization of any scale in any sector depends, to a large extent, on its internal functioning, i.e. on the extent and dynamics of different processes which take place as a result of interactions and role playing by its members. Studies on this aspect of fishing cooperative societies have not been conducted. Thus, fishing cooperative societies as a social organization have not been studied in India. The present study was undertaken to assess the internal functioning of the fishing cooperative societies established and promoted under different scenarios.

MATERIALS AND METHODS

The study covered 58 fishing cooperative societies at the following identified locations of three selected states: Gobind Sagar and Pong reservoirs (H.P.); Tawa and Bergi reservoirs (M.P.) and societies from Sultanpur, Faizabad, Ambedkarnagar, Jhansi and Lalitpur districts (U.P.). A total of 580 members and office bearers of fishing cooperative societies were interviewed with the help of a specially prepared questionnaire.

The internal functioning of the fishing cooperative societies was operationalised in terms of the sum total of perceived opinion and experiences of fisher folk members about six dimensions namely: adequacy and openness of communication in the society's functioning; effectiveness of leadership for working

towards society's good; decision-making process in the society; participation of members in society's activities; mutual trust among members, and satisfaction of members with the performance of the society. An index was prepared which consisted of 24 statements related to the above mentioned six dimensions (4 statements for each dimension). Both negative and positive statements were included in the index so that the responses of the respondents could be cross-checked. The opinion/experiences of the member fisher folks was sought on a three point rating scale (in the form of: always, sometimes, never; OR in the form of: agree, disagree, can't say; OR very much, less, not at all; depending upon the nature of statement) and scores 3, 2, 1 were given for each positive statement. The scores were reversed in case of negative statements. Thus, total score for each dimension could range 4-12, whereas overall score of a respondent could range 24-72. The responses could be analyzed using simple distribution statistics and respondents could be categorized into three categories (having high, medium and low perception towards functioning of the fishing cooperative societies) based on their mean scores and the standard deviation.

RESULTS AND DISCUSSION

The functioning of the fishing cooperative societies was measured with the help of a specially prepared index which consisted of six dimensions. The results are presented in Tables 1 & 2. The data (Table 1) revealed that the overall functioning of the fishing cooperative societies at Gobindsagar and Pong (HP), and Tawa and Bergi reservoirs was on the higher side (mean score above 43 out of 72), where as, it was low (mean score 25.61 out of 72) for members at the small reservoir & lakes of UP. Though majority of the respondents at most of the locations perceived the functioning of fishing cooperative societies in the medium category but, greater portion of the respondents (approx. one-

Table 1: Overall functioning of fishing cooperative societies in different states

Overall functioning of fishing cooperative societies	Gobindsagar reservoir, H.P. (N=110) f (%)	Pong reservoir, H.P. (N=90) f (%)	Tawa reservoir, M.P. (N=100) f (%)	Bergi reservoir, M.P. (N=150) f (%)	Small lakes of U.P. (N=90) f (%)
Low	16 (14.5)	08 (8.9)	10 (10.0)	20 (13.3)	32 (35.5)
Medium	68 (61.9)	61 (67.8)	58 (58.0)	94 (62.7)	52 (57.8)
High	26 (23.6)	21 (23.3)	32 (32.0)	36 (24.0)	06 (6.7)
Mean	43.05	44.09	45.21	45.94	25.61
SD	3.26	2.11	2.73	2.73	4.32

third of the total studied) at the sites of UP perceived the functioning of fishing cooperative societies in the low category. Over one-fourth of the respondents at all locations, except at the sites of UP, perceived the functioning of fishing cooperative societies in the high category. The responses of the fisher folks on each of the individual dimension of the functioning of fishing cooperative societies were also analyzed. It is clear from the data (Table 2) that the same trend was discernible with respect to all the dimensions of the functioning of the cooperative societies at the selected locations. A closer look at the data reveals that on dimensions communication, leadership, decision-making and participation, the respondents of from Tawa and Bergi reservoirs of M.P. perceived their societies to be

functioning slightly better than even the societies of Himachal Pradesh. The difference, though minor, could be because of the involvement of a non-governmental organization at these locations which was playing educational and mass mobilization roles among the members of fishing cooperative societies. Detail informal interviews with the respondents revealed that cooperative societies in H.P. and M.P., besides playing routine production-oriented and regulatory functions like coordinating and regulating the collection and marketing of fishery of their members, providing a structural base for state agencies to collect royalty from fish production, facilitating equitable sharing of benefits among their members, maintaining proper records, etc; also played a number of educational roles. These roles

Table 2: Functioning of fishing cooperative societies on selected dimensions

Dimension of functioning	Gobindsagar reservoir, H.P. (N=110)	Pong reservoir, H.P. (N=90)	Tawa reservoir, M.P. (N=100)	Bergi reservoir, M.P. (N=150)	Small lakes of U.P. (N=90)
Communication					
Low	16 (14.6)	19 (27.1)	12 (12.0)	28 (19.7)	37 (41.1)
Medium	70 (63.6)	51 (56.7)	62 (62.0)	87 (58.0)	50 (55.6)
High	24 (21.8)	20 (22.2)	26 (26.0)	35 (23.3)	03 (3.3)
Mean	7.16	7.07	7.46	7.36	4.43
SD	0.76	0.73	0.71	0.61	1.86
Leadership					
Low	18 (16.4)	15 (16.7)	12 (12.0)	20 (13.3)	38 (42.2)
Medium	68 (61.8)	55 (61.1)	58 (58.0)	95 (63.4)	48 (53.3)
High	24 (21.8)	20 (22.2)	30 (30.0)	35 (23.3)	04 (4.5)
Mean	7.07	7.12	7.50	7.58	4.43
SD	0.75	0.79	0.81	0.75	1.86
Decision-making					
Low	20 (18.2)	12 (13.3)	11 (11.0)	22 (14.7)	34 (37.8)
Medium	65 (59.1)	63 (70.0)	57 (57.0)	90 (60.0)	50 (55.6)
High	25 (22.7)	15 (16.7)	32 (32.0)	38 (25.3)	06 (6.6)
Mean	6.82	6.93	7.29	7.37	3.91
SD	0.92	1.0	0.94	0.82	1.33
Trust					
Low	14 (12.7)	09 (10.0)	15 (15.0)	28 (19.7)	26 (28.9)
Medium	62 (56.4)	61 (67.8)	55 (55.0)	93 (62.0)	56 (62.2)
High	34 (30.9)	20 (22.2)	30 (30.0)	29 (19.3)	08 (8.9)
Mean	7.00	7.10	7.20	6.95	4.86
SD	0.81	0.86	0.81	0.70	1.20
Participation					
Low	13 (11.8)	12 (13.3)	09 (9.0)	18 (12.0)	30 (33.3)
Medium	65 (59.1)	50 (55.6)	56 (56.0)	96 (64.0)	54 (60.0)
High	32 (29.1)	28 (31.1)	35 (35.0)	36 (24.0)	06 (6.7)
Mean	7.10	6.85	7.35	7.45	3.82
SD	0.92	0.79	0.93	0.82	1.38
Performance					
Low	14 (12.7)	09 (10.0)	11 (11.0)	26 (17.3)	31 (34.4)
Medium	67 (60.0)	61 (67.8)	58 (58.0)	90 (60.0)	55 (61.2)
High	29 (26.3)	20 (22.2)	31 (31.0)	34 (22.7)	04 (4.4)
Mean	7.30	7.42	7.45	7.10	4.16
SD	0.85	0.70	0.83	0.78	1.52

The figures in parentheses indicate the percentage

included: providing an organizational base at grass- root level for state fish agencies to implement resource enhancement measures, offer suggestions to state agencies and eager to innovate for improving resources, facilitate equitable sharing of benefits among its members, provide moral support to their members, devise mechanisms & procedures to coordinate the fishing efforts and fish marketing activities, undertake efforts and serve as a social & organizational force for making members to abide by conservation rules and make and implement own conservation rules

In U.P. however, the situation was altogether different. The respondents perceived their societies to be functioning very low on all the selected dimensions. Informal interactions with the respondents revealed that the cooperative institutions were mostly dormant in U.P., controlled by influential people without much involvement of members. They were formed for taking advantage of Govt. schemes. The element of social & organizational force for members was not there in fishing cooperative societies of U.P.

CONCLUSION

Overall functioning of the fishing cooperative societies was high in H.P. and M.P. However, it was low in U.P. Higher functioning of the fishing cooperative societies in H.P. may be partly due to their higher socio-economic status. However, this may largely be due to the fact that in H.P., a system of cooperative management of these resources have been developed by the state fisheries department over last three decades. Thus, effective functioning of fishing cooperative societies and greater efforts of the state fisheries department in working closely with the fishing cooperative societies and their members, may have contributed towards higher perception of the functioning of the fishing cooperative societies in H.P. In M.P., the higher functioning of the fishing cooperative societies at the selected Tawa and Bergi reservoirs may be due to other reasons. Actually, the fisher folks at these two reservoirs, who are dam-displaced people, had organized themselves into fishing cooperative societies and federations with the help of NGOs and social workers and struggled to take the fishing and management rights in these respective reservoirs. Thus, due to this experience of organization, collective mobilization and participation in the fisheries management, functioning of their fishing cooperative

societies may be high at these locations. However, no such efforts have taken place in U.P., therefore, fisher folks in U.P. had perceived very low level of the functioning of the fishing cooperative societies.

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Adoption Level and Constraints of Soybean Production Technology in Sagar District of Madhya Pradesh

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ABSTRACT

Soybean is a major crop grown during the kharif or monsoon season (July-October) in the dry land areas of central and peninsular India. Madhya Pradesh is known as major soybean producer of India, comprising 55 per cent of the total national area of soybean cultivation. Higher soybean production can be achieved by adoption of all the recommended production technologies by large number of farmers. This study was conducted during 2008-09 in five villages of district Sagar of Vindhyan Plateau Agro-climatic zone of Madhya Pradesh. The overall adoption level of respondents on soybean cultivation was assessed and findings revealed that most of the respondents had medium level of adoption (45.00 per cent) followed by low (37.00 per cent) and higher (18.00 per cent). The practice wise data collected for the extent of adoption of recommended soybean cultivation practices revealed that only 25 per cent farmers ploughed their field as recommended, 10 per cent farmers were adopted deep summer ploughing, non-descriptive varieties was adopted by 65 per cent of the farmers, 11 per cent of respondents had adopted the recommended seed rate in their cultivation, 82 per cent farmers were sown their crop in recommended time, 45 per cent farmer had opted the recommended method of sowing, 32 per cent farmers adopted recommended intercropping, seed treatment with fungicide was adopted by the 60 per cent of the farmers, 25 per cent farmers had adopted seed inoculation with PSB, 92 per cent farmers were using imbalanced dose of fertilizer, 2 per cent of the farmers applied the recommended need based irrigation and proper drainage, 70 per cent farmers were adopted recommended herbicide as a chemical weed control measure while 25 per cent farmers were applied manual weed management, 90 per cent farmers followed plant protection measures as chemical control, 8 per cent farmers were adopted plant protection practices below than the recommendation and 2 per cent were adopted as recommended major IPM components. The maximum soybean growers were facing hindrances in the production technology due to unavailability and no use of suitable high yielding varieties in time (85 per cent). Heavy weed infestation ranked as the second most important constraints by 78 per cent of respondents. High incidence of pest and diseases were an important constraint mentioned by 65 per cent of the respondents. The soybean cultivators reported that potential yield of the crop was not achieved due to high cost of input materials and high cost of wages. Lack of awareness and knowledge about certain technological interventions were the major constraints perceived by 83 per cent of respondents. Lack of conviction in new technologies was also expressed by 75 per cent of the respondents. Weak extension activities at village level were reported by 62 per cent of the respondents and major agro climatic constraints i.e. erratic rain fall received during growth period perceived by 88 per cent of the respondents, which resulted in poor seed setting and low yield in the crop. In other agro climatic constraints, 73 per cent respondents prioritized the disease and pest incidence due to high humidity and poor soil fertility was realized by 60 per cent respondents.

Keywords: Adoption level, Production technology, Constraints, Soybean

INTRODUCTION

Soybean (*Glycine max* L. Merrill) is currently a major crop grown during the *kharif* or monsoon season (July-October) in the dry land areas of central and peninsular

India. Soybean contains about 20 per cent oil and 40 per cent high quality protein. Soybean protein is rich in the valuable amino acid lysine (5 per cent) in which most of the cereals are deficient. Madhya Pradesh is known as major soybean state of India, comprising 55

per cent of the total national area of soybean cultivation. In India, soybean cultivation is low as compared to other major soybean growing countries like U.S.A., Brazil, Argentina, China etc. and was remained more or less stagnant since soybean was introduced to India in the early 1970s. Despite this, the area of soybean cultivation in Madhya Pradesh and India continues to increase at a fast rate. In India it is cultivated in 72,00,000 hectare area with the total production of 55,00,000 metric tones and the average productivity of soybean is 763 kg/ha. The area, production and productivity of soybean in the state of Madhya Pradesh are 51.434 lakh ha; 57.759 lakh metric tones and 1123 kg/ha, respectively and in the Sagar division, the area, production and productivity are 3.621 lakh ha, 3.437 lakh tones and 949 kg/ha, respectively. Sagar district of Madhya Pradesh occupies 2.519 lakh ha of land and 2.422 lakh tones production with the average productivity of 950 kg/ha of soybean.

Several studies have indicated that the adoption of recommended soybean cultivation practices gives high yields and income to the farmers. Soybean productivity is far below the potential yield. All the research efforts to develop a technology are useless unless farmers adopt the technology. Higher soybean production can be achieved by adoption of all the recommended production technologies by large number of farmers. In general, recommended soybean production technologies are not accepted by the farmers at a time and also to full extent. This is because of lack of awareness and knowledge about these innovations. Keeping these in view, this study was undertaken to find out the extent of adoption of recommended soybean cultivation practices.

MATERIALS AND METHODS

This study was conducted during 2008-09 in five villages viz, Badaua, Mankyai, Kanheragaon, Semadhana and Rajauaa of Jasi nagar block of district Sagar of Vindhyan Plateau Agro-climatic zone of Madhya Pradesh. The total number of respondents were 100, out of these 20 respondents were chosen at random separately from each selected villages and twelve recommended soybean cultivation practices were selected to study the adoption level. Personal interviews were conducted by using pre tested structured interview schedule. The adoption level was categorized into low, medium and high level of adoption. In this investigation, constraints faced by the farmers in adoption of soybean production technologies

were studied. An interview schedule was used to collect the data and collected data were analyzed by using simple percentage analysis.

RESULTS AND DISCUSSION

The overall adoption level of respondents on soybean cultivation was assessed and findings are given in Table 1. The findings revealed that most of the respondents had medium level of adoption (45.00 per cent) followed by low (37.00 per cent) and higher (18.00 per cent) levels of adoption of recommended soybean cultivation practices.

Table 1: Distribution of respondents according to their overall adoption of recommended soybean production practices (N=100)

Category	Number of respondents	Per cent
Low	37	37.00
Medium	45	45.00
High	18	18.00
Total	100	100.00

Thus, it could be concluded that there existed, medium level of adoption of recommended soybean cultivation practices among respondents. These findings are in line with findings of Singh and Varashney (2010) and Dwivedi *et al.*(2010) who have reported medium level of adoption of recommended practices. The practice wise data collected for the extent of adoption of recommended soybean cultivation practices are presented in Table 2.

Preparatory tillage: Soybean requires a good seedbed with a reasonable fine texture and not too many clods. Land should be well leveled and be free from stubbles. One deep ploughing with mould board plough and two harrowing for soybean crop is recommended. The information presented in Table 2 reveals that only 25 per cent farmers ploughed their field as recommended whereas, majority of the farmers (75 per cent) followed below or over tillage practices.

Deep Ploughing in summer: It is recommended cultural practices for pest and perennial weed management. Deep ploughing during summer season to expose soil inhabiting/resting stage of insects, pathogens as well as weeds to sun light and predation by birds. The data in Table 2 indicated that only 10 percent farmers were adopted as per the recommendation while majority of

Table 2: Distribution of respondents according to their practice-wise adoption of recommended soybean production practices (N=100)

Recommended cultivation practices	No. of respondents	Adoption percentage
Preparatory trillage		
As recommended	25	25.00
Below/above recommended	75	75.00
Deep ploughing in summer		
As recommended	18	18.00
Nil (not-adopted)	82	82.00
Varieties		
As recommended	35	35.00
Non descriptive local old mix varieties	65	65.00
Seed rate		
As recommended	11	11.00
Above than the recommendation	89	89.00
Time of sowing		
In recommended time	82	82.00
After recommended time	18	18.00
Sowing method		
As recommended	45	45.00
Broadcasting (non recommended)	55	55.00
Intercropping		
As recommended	32	32.00
Nil (Not adopted)	68	68.00
Seed treatment		
Treated with Thiram/Bavistin	60	60.00
Treated with Rhizobium culture and PSB	25	25.00
Untreated	15	15.00
Fertilizer dose		
Recommended	08	08.00
Imbalanced use	92	92.00
Water management		
As recommended need based irrigation and proper drainage	02	02.00
Nil	98	98.00
Weed management		
Manual	25	25.00
As chemical recommendation	70	70.00
No weed management	05	05.00
Plant protection measures		
As recommended major IPM components	02	02.00
Only chemical control	90	90.00
Below than the recommendation	8	08.00

the farmers (82 per cent) did not use the recommended summer deep ploughing for the management of insect-pests, diseases, rhizomes and bulbs of perennial weeds.

Varieties : Selection of suitable varieties is very important for getting higher yield. The recommended resistant/tolerant varieties of soybean are JS 335, JS 71-05, JS 97-

52, NRC 12, JS 8021, JS 9041, JS 7546, Indira, PK 1042, PK 1024 etc. All the varieties are resistant/tolerant to stem fly, girdle beetle, rust, stem rot and leaf spots. A perusal of the data in Table 2 indicate that 35 per cent farmers adopted the recommended varieties in their cultivation. Lower adoption of recommended varieties was non availability of seeds in time and lack of knowledge about the improved varieties. Non-descriptive local old varieties was adopted by 65 per cent of the farmers because of lack of knowledge about importance of improved varieties

Seed rate: To achieve a desired plant density, seed rate of soybean is decided on the basis of germination percentage, seed size and sowing time. If seed is of 80 per cent germination, 75-80 kg seeds per hectare is required and for late planting, the recommended seed rate is 100-120 kg/ha. The data in Table 2 indicate that the majority of the farmers (89 per cent) was adopted seed rate more than the recommendation. Only 11 percent of respondents had adopted the recommended seed rate in their cultivation. The reason of not using recommended seed rate by the farmers was lack of awareness about importance of seed rate.

Time of sowing: It is the most important factor because most of the varieties of soybean are sensitive to photoperiod and require short day condition for flowering. The recommended time of sowing of soybean crop is upto first week of July. June planting requires irrigations before sowing and also takes longer period to mature and is highly susceptible to yellow mosaic virus. Pre-monsoon sowing must be avoided. The Table 2 shows that the 82 per cent farmers were sown their crop in recommended time while rest 18 percent farmers have sown after recommended time. The most of the farmers were much concerned about importance of timely sowing. The decision of sowing after recommended time was observed to be based on the continuous rainfall in the month of July and there was no chance for sowing.

Sowing methods: It is an important management factors which has direct effect on seed requirement, plant establishment, performance of cultural operations and efficiency of production inputs. Line sowing 45 to 60 cm, plant to plant 5 cm and 3-4 cm deep with seed drill or behind the plough is recommended. After every 15 rows, a gap of one row should be given to provide moving space for spraying in standing crop. Little more than half of the farmers (55 per cent) are not using the

recommended sowing method due to lack of knowledge about importance of recommended sowing methods. It is clear from Table 2 that 45 per cent farmers had opted the recommended method of sowing.

Intercropping: As per recommendation, intercropping of soybean either with pigeon pea or maize or sorghum in the sequence of 4 rows of soybean with 2 rows of intercrop should be practiced. In girdle beetle and semilooper endemic areas, intercropping with maize or sorghum should be avoided. It is evident from Table 2 that majority of the farmers (68 per cent) not adopted recommended intercropping practices whereas only 32 per cent farmers were adopted. The lower adoption, might be due to limited awareness and knowledge of farmers about the intercropping.

Seed Treatments: To reduce the fungal attack the seed should be treated prior to sowing with fungicides like Thiram @ 4.5 g/kg of seed or with a mixture of Thiram+Bavistin (1:1) @ 2g/kg of seed. Seed inoculation should be followed by seed treatment with *Rhizobium japonicum* and Phosphorus solubilising bacteria (PSB) culture @ 5-10 g/kg of seed for efficient biological fixation of atmospheric nitrogen (better nodulation). The analysis reveals that the seed treatment with fungicide was adopted by the 60 per cent of the farmers as per the recommendations while 25 per cent farmers had adopted seed inoculation with PSB. The non-adopters about 15 per cent farmers were not convinced of the practice due to lack of knowledge about advantages of seed treatment.

Fertilizer dose: As per recommendation, 20 kg nitrogen, 60 kg phosphorus, 20 kg potash and 20 kg sulphur should be applied. As evident from Table 2 only few respondents (8 per cent) followed the recommended dose of fertilizer whereas majority of the farmers (92 per cent) were using imbalance fertilizer dose. This might be due to lack of awareness and knowledge about importance of balanced dose of fertilizers.

Water management: During kharif season, soybean crop does not require any irrigation. However, a long at the time of pod filling, one irrigation would be desirable. During excessive rains proper drainage is also equally important. Table 2 expresses that very few only 2 per cent of the farmers applied the recommended need based irrigation and proper drainage whereas majority of the farmers 98 per cent did not adopt this practice. This might be due to scarcity of water or non availability of irrigation facilities in cluster villages.

Weed managements: Weeds compete with crop plants for various production resources such as nutrients, moisture, sunlight, space and consequently reduces yield. Soybean crop is very sensitive to early weed competition and may reduce yield by 40-45 per cent depending upon the intensity, nature and duration of weed competition. Soybean field should be kept free of weeds for the first 30 to 45 days after sowing. As per recommendation, two manual weeding 20 and 40-50 days after sowing are generally sufficient for the control of weeds. Where hand weeding is not possible

Table 3: Constraints faced by the respondents in adoption of soybean production technologies (N=100)

Constraints	No. of respondents	Percentage	Rank
Bio-physical constraints			
Non-unavailability suitable high yielding varieties	85	85.00	I
Heavy weed infestation	78	78.00	II
High incidence of disease and pest	65	65.00	III
Socio-economic constraints			
High cost of inputs	70	70.00	IV
High rates of labour/wages	79	79.00	III
Non-availability of skilled labour	88	88.00	II
Lack of support price and profitable marketing system	92	92.00	I
Technological constraints			
Lack of technological interventions	83	83.00	I
Lack of conviction	75	75.00	II
Weak extension support	62	62.00	III
Agronomical constraints			
Poor fertility of soil	60	60.00	III
Occurrence of pest and diseases due to high humidity	73	73.00	II
Crop damage due to erratic rainfall	88	88.00	I

Alachlor (Lasso) @ 2.5 kg a.i./ha or Metalachlor @ 1.0 kg a.i./ha as pre-emergence mainly for controlling grassy weeds or Imazethapyr @ 0.1 kg a.i./ha 18 to 25 days after sowing or Fluchloralin (Basalin) @ 1.0 kg a.i./ha as pre-sown incorporation into the soil may be used. The data from Table 2 reveals that 70 per cent farmers are adopting recommended herbicide as a chemical weed control while 25 per cent farmers are applying manual weed management and only 5 per cent farmers did not adopt this practice. It is because of lack of knowledge about losses in productivity of due to weeds.

Plant protection measures: Stem fly, girdle beetle, green semilooper, tobacco caterpillar, rust, *sclerotium* stem rot, myrothecium leaf spot and yellow mosaic are major biotic stresses in soybean crop. Collection and destruction of girdle beetle infested plant parts, egg masses and gregariously feeding larvae of hairy caterpillar is the recommended practice. Spray of NSKE @ 5% is recommended for the management of early stage of larvae and sucking pest. Application of Furaden 3G/Phorate 10 g @ 10 kg/ha as soil application is recommended for the control of stemfly, girdle beetle and sucking pest. In the standing crop for controlling defoliators the tobacco caterpillar, semiloopers, stemfly, girdle beetle and hairy caterpillar, Ethofenprox 10 EC @ 1 lit/ha or Triazophos 40 EC @ 625 ml/ha are recommended and Hexaconazole 5% EC @ 0.1% or Propiconazole 25 EC @ 500 ml/ha or Triademifon 25% EC @ 1000 ml/ha are recommended for the control of rust. Carbendazim @ 0.1% is quite effective against foliar diseases after 35 and 50 days after sowing. An ideal integrated pest management (IPM) module for soybean crop has also been developed.

As regards to plant protection measures, the data reveals that 90 per cent farmers followed plant protection measures as chemical control whereas 8 per cent farmers were adopted plant protection practices below than the recommendation and a very few respondents (2 per cent) were adopted recommended major IPM components. The reason of not using recommended plant protection measures were mostly attributed by the farmers to the lack of knowledge about importance of IPM module and lack of conviction. The findings were in accordance with respect of Dwivedi *et al.* (2010), Dhole *et al.* (2009).

CONCLUSION

The soybean growers reported many constraints in the production of the crop. The data related to these are presented in the Table 3. It was observed under bio-

physical constraints, the maximum soybean growers reported that they were facing hindrances in the production technology due to unavailability and no use of suitable high yielding varieties in time (85 per cent). High yielding variety seeds were not available in time at local market and block level agricultural offices. Besides, these were also not available in adequate quantity to fulfill their needs. Occurrence of heavy weed infestation ranked as the second most important constraints by 78 per cent of respondents. Weed growth was considered as one of the major factors responsible for reducing soybean yield in these areas. In addition to these, lack of knowledge, non-availability of suitable herbicide and equipments, high cost of inputs, non-availability of skilled labour were the main reason for non-adoption of recommended weed management technologies. High incidence of pest and diseases were an important constraint mentioned by 65 per cent of the respondents.

Under socio-economic constraints it was found that 92 per cent respondents faced difficulties regarding lack of supporting price and profitable marketing system followed by skilled labour in time (88 per cent), high cost of wages (79 per cent) and high cost of inputs (70 per cent). The soybean cultivators reported that potential yield of the crop was not achieved due to high cost of input materials and high cost of wages.

In technological constraints, lack of awareness and knowledge about certain technological interventions were the major constraints by 83 per cent of the respondents in adopting recommended soybean production technologies in their farm. Lack of conviction in new technologies was also expressed by 75 per cent of the respondents in the soybean cultivation. Majority of the respondents were not convinced about the importance of production technologies and could not adopt them. Weak extension activities at village level were reported by 62 per cent of the respondents. The respondents reportedly said that the extension personnel of the State Department of Agriculture, NGOs and others agencies were not taking adequate efforts to create awareness about the recent technologies for productivity enhancement.

Similarly, the major agro climatic constraints perceived by the respondents in order of importance was crop damage due to erratic rain fall received during growth period (88 per cent) which resulted in poor seed

setting and low yield in the crop. In other agro climatic constraints, 73 per cent respondent prioritized the disease and pest incidence due to high humidity and poor soil fertility was realized by 60 per cent respondents.

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Qualitative Analysis of Contents of Changi Kheti Magazine

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ABSTRACT

Thirty six issues of *Changi Kheti* magazine published by Punjab Agricultural University from July 2008 to June 2011 were taken up for the purpose of qualitative analysis of contents. A sample of 50 individual life members and their spouses (50) of Ludhiana district was selected proportionately. The data were collected with the help of interview schedule. The study revealed that contents of the selected magazine comprised of editorials, articles, illustrations, photographs, advertisements, success stories and miscellaneous items. Majority of the respondents reported that technical terms were less frequently used. So it is easy to read and understand the matter of this magazine and almost all the readers reported their liking for this magazine. Qualitative analysis was studied with the help of reading difficulty index and reactions of the readers towards the contents of *Changi Kheti* magazine. It was found that contents of selected magazine could be termed as easy to understand for the general people in terms of Gunning (1952) and all the respondents were satisfied with the present periodicity and volume of this magazine. Majority of the respondents stated that the contents of this magazine were fully comprehensible, practicable, useful, always relevant, timely and highly motivational. Almost all the respondents reported their liking for the selected magazine.

Keywords: Content, Qualitative analysis, Reading difficulty

INTRODUCTION

A large segment of Indian population still lives in villages. In every village, there are handfuls of farmers who are progressive, innovative and willing to take up the risk. They want more information that can help them to increase their agricultural production considerably. Mass Media is the technological means of sending information, ideas and opinions from a communicator to a complex audience. The vital role of disseminating information, ideas and attitudes to the audience is accomplished by various media of mass communication. Among the several mass media, newspapers and farm magazines 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. The print media widened the scope of communication. It is cheap and affordable to majority of the population so that they can read them at their convenience. It is a permanent medium as the message are printed permanently with high storage value which makes them suitable for reference and research. Two farm magazines

'Progressive Farming' in English and '*Changi Kheti*' in Punjabi were started in the year 1964 and 1965 respectively by Punjab Agricultural University. These magazines provide timely and latest information to the readers. These contain articles of scientists related agriculture and allied occupations sectors. These magazines played an important role by bridging the gap between the researchers and the farmers. Therefore, the present study was planned to analyse the qualitative content in terms of reading difficulty and reactions of the readers towards the *Changi Kheti* magazine.

MATERIAL AND METHODS

The present study was related to the life member subscribers of *Changi Kheti* magazine of Punjab Agricultural University, who were residing within the Ludhiana district, therefore it was carried out in Ludhiana district. The list of individual life members (male and female) of *Changi Kheti* Magazine of Ludhiana district was secured from the Centre for Communication and International Linkages, Punjab Agricultural University, Ludhiana. It was found that there were 120 individual life members. A sample of 50 individual life members and their spouses (50) was selected proportionately. Thus, in all 100 respondents

were selected as sample for the present study (50 Male & 50 Females). The data were collected with the help of interview schedule. The data was analysed with the help of Fog Index developed by Gunning. Thirty six issues of *Changi Kheti* from the July 2008- June 2011 were selected for the purpose of study.

Qualitative analysis of contents was studied in terms of reading difficulty of the contents and reactions of readers towards the contents of *Changi Kheti* magazine. Reading difficulty index (Fog Index) developed by Gunning (1952) was considered as guidelines for analysing the same. Since the Fog Index has been developed in English language. The same index cannot be used for Punjabi language therefore the parameters suggested in the Fog Index were used for analysing the parameters for reading difficulty index. Reader's reactions were based upon the expressed opinion of the life-members about the usefulness of the contents of *Changi Kheti*. To study the usefulness of contents, different dimensions such as comprehension, practicability, relevancy, timeliness, use of technical terms, motivational, trustworthiness and entertainment were selected with the help of literature and experts. Interview schedule was used to collect the information.

RESULTS AND DISCUSSION

Qualitative analysis of contents was studied with the help of reading difficulty index and readers reactions towards the contents of *Changi Kheti* magazine. It is discussed below:

Measurement of reading difficulty index: According to the most dictionaries, the word 'readable' means easy to read. Reading ease is an estimate of the ease with which a reader is reading and understanding what has been written. To measure the reading difficulty index, a sample of content approximately 100 words was selected randomly from the selected issues of *Changi Kheti*. The following steps were followed:

- Counted the number of words in a sample.
- Counted the number of sentences in a sample.
- Calculated the average sentence length (by dividing the number of words by number of sentences).
- Calculated the number of complex words.
- Calculated the percentage of complex words in a sample.
- Summary of words average and complex words percentage.

- Calculated the readability difficulty index by multiplying the sum of words and complex words percentage by 0.4.

As per the instructions of Fog Index, higher the index value, lower is the readability of the material. This instruction was observed as criteria for determining difficulty of readability by using the following formula:

$$RDI^* = 0.4 \left\{ \left[\frac{\text{Words}}{\text{Sentences}} \right] + 100 \left[\frac{\text{Complex Words}}{\text{Words}} \right] \right\}$$

Where,

RDI* is Reading Difficulty Index

0.4 = Standard Score

A sample of 110 words was selected randomly from an issue of *Changi Kheti* magazine and it was calculated as following:

Total Words – 110

Total Sentences – 6

Total Hard Words - 1

$$\begin{aligned} &= 0.4 \left\{ \left[\frac{110}{6} \right] + 100 \left[\frac{1}{110} \right] \right\} \\ &= 0.4 \left\{ [18.33] + 100 [0.0091] \right\} \\ &= 0.4 \times 19.24 = 7.7 \end{aligned}$$

It would not be wise to measure every sentence you write by this calculation. The formula can help to give an idea of how appropriate the writing is for your readers. So here is the guideline to go by:

This value of reading difficulty index (7.7) meant that the readability of the contents contained in this magazine could be termed as easy to understand for the general people. The average length of sentences per sample of 110 words was found about 18. So, it could be said that the language of the content of *Changi Kheti* was according to the level of the readers. Therefore, it was easy for the rural readers to understand the information given in this magazine.

Reactions of the readers regarding usefulness of contents of *Changi Kheti*: The reactions of readers were obtained for the selected dimensions. These dimensions were comprehension, practicability, relevancy, timeliness, use of technical terms, motivational, trustworthiness and entertaining. The reactions of selected readers were studied for these dimensions on

Reading difficulty index (value)	Population
7-8	General people
9-10	Average 15 year old
11-13	College student
14-16	University student
Over 18	Too difficult for newspaper

three point scale and scored as 3, 2 and 1 as given in Table 1.

Volume & Periodicity of the magazine: The respondents were asked to indicate their views about the volume & periodicity of the selected magazine. It was observed that all the selected 100 respondents were fully satisfied with the present volume of the magazine. No respondent wanted any change in the volume & periodicity of the magazine. The reason for this could be that most of the farm operations were month-wise and this magazine managed to supply information accordingly.

Comprehension of the contents: The information given in this magazine will be useful for the readers only if it can be rightly comprehend by the readers. The respondents were asked for their opinion about the comprehension level of the content of the selected magazine. The responses showed that majority of the respondents (94%) viewed the content as being 'Fully comprehensible'. Whereas only 6 per cent respondents were of the opinion that contents were 'Partially Comprehensible'. But no respondent viewed the content as being 'Little Comprehensible'. It could be concluded that most of the contents was found 'fully comprehended' by majority of the readers. It could be because of the use of simple language and good way of presentation by the authors of the articles for this magazine. Moreover, it is in conformity with the reading difficult index.

Practicability of contents: It is a very important dimension as it is related with the information given in the magazine which was considered applicable by the readers for use in their own situations of farming. The data showed that the contents were perceived as 'fully practicable' by majority (95%) of the respondents, while only 5 per cent of them found it 'somewhat practicable' and no respondent reported the information given in the contents of this magazine as 'not practicable'. It could be concluded that mostly the information in the

contents was considered as practicable by the respondents. This could be due to the fact that the main aim of this magazine is to provide information of practicable use to the farmers.

Relevancy of the contents to readers: It refers to the appropriateness of the content of the magazine in terms of the needs of the readers in their own situations. The data showed that 85 per cent respondents perceived the contents as 'always relevant' while 15 per cent of them found it as 'somewhat relevant'. It was surprising to note that no respondent perceived the content as 'not relevant'. Majority of the respondents found that the information given in the contents of the selected magazine was relevant to their needs.

Timeliness of the contents: Change in the crops due to the seasonal variations is an important factor to make the information timely for the readers. So it is very important to study this aspect of the magazine. The data revealed that 81 per cent respondents found the information given in the contents of the *Changi Kheti* magazine as 'always timely' while 18 per cent of them found it as 'sometimes timely'. On the other hand, only one per cent of the readers perceived it as 'never timely'. These results may be due to the fact that selection of theme as all the twelve issues focus on themes, which are selected on the basis of season and the major crops of that season.

Use of technical terms: Any type of information will be useful only if it will be understandable to its readers. The language of the articles affects its comprehensibility by the readers. It can be influenced by the use of scientific and technical terms used by the writer. The extent of use of technical terms in this magazine was studied. It was found that as many as 86 per cent of the respondents felt that technical terms were being used 'less frequently' by the writers of this magazine, while 14 per cent of them expressed that these were used frequently in the magazine. This may be due to the fact that this magazine contained articles authorised by the university experts and scientists. No respondent reported that technical terms were 'not used'. It is observed that majority of the respondents understood the articles easily due to less use of technical terms in the given information.

Motivational: This aspect refers to how far the information given in the selected magazine prepared the readers to choose a particular course of action. The data indicated that only 2 per cent of the respondents

Table 1: Distribution of respondents according to various dimensions of usefulness of contents of *Changi Kheti* (N=100)

Dimensions	Male (%) (f)	Female (%) (f)	Total (%) (f)
Comprehension			
Fully comprehensible	48(96.00)	46(92.00)	94(94.00)
Partially comprehensible	2(4.00)	4(8.00)	6(6.00)
A little comprehensible	-	-	
Practicability			
Fully practicable	46(92.00)	49(98.00)	95(95.00)
Somewhat practicable	4(8.00)	1(2.00)	5(5.00)
Not practicable	-	-	
Relevancy			
Always relevant	38(76.00)	47(94.00)	85(85.00)
Somewhat relevant	12(24.00)	3(6.00)	15(15.00)
Not relevant	-	-	
Timeliness			
Always timely	33(66.00)	48(96.00)	81(81.00)
Sometimes timely	16(32.00)	2(4.00)	18(18.00)
Never timely	1(2.00)	-	1(1.00)
Use of technical terms			
Frequently used	8(16.00)	6(12.00)	14(14.00)
Less frequently used	42(84.00)	44(88.00)	86(86.00)
Not used	-	-	
Motivational			
Highly motivational	37(74.00)	41(82.00)	78(78.00)
Somewhat motivational	11(22.00)	9(18.00)	20(20.00)
Not motivational	2(4.00)	-	
Trustworthiness			
Very much trusted	47(94.00)	50(100)	97(97.00)
Somewhat trusted	3(6.00)	-	3(3.00)
Not trusted	-	-	
Entertaining			
Very entertaining	4(8.00)	30(60.00)	34(34.00)
Somewhat entertaining	44(88.00)	20(40.00)	64(64.00)
Not at all entertaining	2(4.00)	-	2(2.00)

considered the contents as 'not motivational'. On the other hand 20 per cent of the selected respondents viewed the contents of the magazine as 'somewhat motivational'. Whereas, 78 per cent of the respondents thought themselves as 'highly motivated' by the contents of the selected magazine. It could be concluded that the information given in the contents of this magazine did provide a high degree of motivation to the readers.

Trustworthiness: The information will be useful for the readers only if it is true. So trustworthiness is a very important aspect. It refers to the degree to which the information given in the contents of this magazine could be relied upon by the readers. The data showed

that 97 per cent of the respondents found the contents of magazine as 'very much trusted' while, only 3 per cent of them expressed it 'somewhat trustworthy'. It was very surprising to note that not even a single respondent found the content of the magazine 'not trustworthy'. It could be concluded that the information given in this magazine enjoys a high degree of trustworthiness with the respondents.

Entertaining: Entertainment is an important aspect for magazine. No one would like to read any information for a long time if it will not be interesting or entertaining. The data indicated that 64 per cent of the respondents found the information given in this magazine 'somewhat entertaining' while, 34 per cent of

the respondents found the information 'very entertaining'. Only 2 per cent of the readers perceived it as 'not at all entertaining'. It could be concluded from the above data that most of the respondents found the information of contents entertaining as it is based on the interest and utility of the readers only.

CONCLUSION

The calculated value of the reading difficulty index (Fog Index by Gunning) score was 7.7, which meant that the readability of the *Changi Kheti* magazine could be termed as easy to understand for the general people in terms of Gunning (1952). It was found that all the respondents were satisfied with the present periodicity and volume of this magazine. Majority of the respondents stated that the contents of this magazine were fully comprehensive, fully practicable and fully useful. Majority of the respondents felt the contents of this magazine were always timely and relevant to their needs. It may be concluded that the *Changi Kheti* magazine was quite popular among its readers because of its simple language and motivational as well as entertaining contents.

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Multivariate Analysis of Eco-friendly Management Practices by Cotton Growers

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ABSTRACT

The eco-friendly pest management is viewed as a broad ecological approach to pest control employing several methods and techniques viz., cultural, mechanical, biological and chemical in a compatible manner to keep the pest level below economic threshold. The study was conducted in 2011-12 in Yadgir district of North eastern part of Karnataka. The sample size of 160 cotton growers was drawn on proportionate random sample method. The characteristics such as age, education, land holding, deferred gratification and economic motivation did not show significant relationship with knowledge of eco-friendly management practices by cotton growers. Two variables namely risk orientation and achievement motivation had contributed significantly to the knowledge level of eco-friendly management practices by cotton growers. All the eleven independent variables put together contributed to an extent of 46.40 per cent in explaining variation in knowledge level of eco-friendly management practices by cotton growers. The highest and lowest favourable indirect effect was contributed by the variables economic motivation and education. Most of the substantial indirect effect was channalized through risk orientation, achievement motivation and mass media use.

Keywords: Eco-friendly, Socio-economic and Knowledge

INTRODUCTION

Eco-friendly farming helps to avoid chain reaction in the environment from chemical sprays and dusts, helps to prevent environmental degradation and can be used to regenerate degraded areas. It improves soil physio-chemical properties, reduces the need for purchase inputs. Organically grown crops are believed to provide more healthy and nutritionally superior food for man and animals and plants are more resistant to pests and diseases than those grown with commercial fertilizers (Paliniappan and Annadurai, 1999). The important eco-friendly technologies worthy of mentioning are organic farming, natural farming, traditional farming, sustainable farming, bio-dynamic and pharmaculture, which may be all together considered as eco-friendly farming. United States Department of Agriculture (USDA, 1980) has defined eco-farming (organic farming) as a production system, which precludes the use of synthetic fertilizers, pesticides, growth regulators and livestock feed additives. It rather relies more upon crop rotation, crop residues, animal wastes, legumes, green manure, farm wastes, mechanical cultivation and biological pest

management. Considering the importance it has received and the diversified nature of farmers involved in it, this research work was undertaken to study the influence of selected characteristics of the cotton growers on their adoption of the eco-friendly practices. Koshy (2000) opined that in the coming years, our goal should be to develop eco-friendly technologies for attaining the production goals while ensuring sustainable use of natural resources and high efficiency of inputs. There is no adequate and proper documentation of the efforts made by such farmers. As a result, not much literature is available to other farmers about such practices. Farmers lack ready-made packages to jump into such alternative farming methods. Their fear and doubts are kept unanswered. Hence, it was felt necessary to study the management aspects of eco-friendly practices in cotton with the following specific objectives.

1. To study the extent of knowledge of cotton growers about eco-friendly management practices.
2. To find out the relationship between personal, socio-economic, psychological and communication

variables of cotton growers with knowledge level of environmental hazards and eco-friendly management practices.

MATERIALS AND METHODS

The study was conducted in the year 2011-12 in Yadgir district of North Eastern part of Karnataka. From this district, highest cotton growing taluka Shahapur and Shorapur were selected. Eight villages selected based on number of cotton growers in the villages. A list of cotton growers in these villages obtained from the village panchayat office. Using this list from each village 20 cotton growers using were selects random sampling technique, thus constituting a sample size of 160 farmers. The data were collected form respondents by personal interview method with the help of questionnaire developed for this purpose. Knowledge index about eco-friendly management practices was developed for the study. The required data from eco-friendly management practices was carried out using the scoring procedure developed for the purpose. Data were analyzed using the System Application Software (SAS). Appropriate descriptive statistics such as frequencies, percentage scores, mean scores, standard deviations, correlation, multiple regression and path analysis were used to analyze the data.

RESULTS AND DISCUSSION

It is observed from Table 1 that more than fifty per cent of respondents belong to medium knowledge category in respect of eco-friendly management practices, followed by low category (26.25%) and only 21.88 per cent of them belonged to high category. Adequate knowledge of any improved practice is a pre-requisite for its adoption. Research studies established that knowledge of an innovation would lead to its eventual adoption. The results expressed by the respondents regarding knowledge about eco-friendly management practices was at medium and low level to a greater extent. Through knowledge test, it was noticed that majority of the farmers had knowledge in respect of cultural, mechanical methods and selection of crops and cropping pattern. These facts might be the reason for the medium knowledge of eco-friendly practices and cotton.

This trend evidently showed that the components, which are age old, low cost and those easy to practice, were known by all farmers. While, the practices, which were technically complex, involved high cost and

Table 1: Distribution of cotton growers according to their overall knowledge about eco-friendly management practices (n=160)

Knowledge category	Cotton growers	
	Frequency	Per cent
High (17 & above)	35	21.88
Medium (13 – 16.99)	83	51.87
Low (Upto 13)	42	26.25

Mean = 14.36; S.D = 3.14

needed special skills to practice were unknown to few of the respondents. The extension agency and development departments working in the area may take suitable measures to improve knowledge regarding eco-friendly technologies in general and specific technologies related to cotton in particular. The findings were in conformity with the findings of Kalashkar *et al.* (2001) and Noorjehan and Ganesan (2004).

The correlation co-efficient values of all the 15 personal, socio-economic, psychological and communication variable with eco-friendly management practices of cotton growers are furnished in the Table 2. It could be seen from the table that the correlation co-efficient of 10 characteristics *viz.*, annual income,

Table 2: Correlation between characteristics of the cotton growers and their knowledge of eco-friendly management practices (n=160)

Code No.	Characteristics	Correlation coefficient (r)
X ₁	Age	0.0913 ^{NS}
X ₂	Education	0.1002 ^{NS}
X ₃	Land holding	0.0194 ^{NS}
X ₄	Annual income	0.1792*
X ₅	Achievement motivation	0.1842**
X ₆	Innovative proneness	0.2059**
X ₇	Scientific orientation	0.1724*
X ₈	Risk orientation	0.2358**
X ₉	Deferred gratification	0.1125 ^{NS}
X ₁₀	Cosmopolitaness	0.1668*
X ₁₁	Economic motivation	0.1512 ^{NS}
X ₁₂	Attitude towards chemical fertilizers	0.1853*
X ₁₃	Extension participation	0.1657*
X ₁₄	Institutional participation	0.2061**
X ₁₅	Mass media use	0.1968**

NS – Non significant; * Significant at 5 per cent level; ** Significant at 1 per cent level

achievement orientation, innovative proneness, scientific orientation, risk orientation, extension participation, institutional participation, cosmopolitaness, mass media utilization, and attitude towards chemical fertilizers exhibited positively significant relationship with knowledge of eco-friendly management practices. But the characteristics like age, education, land holding, deferred gratification and economic motivation had non-significant relationship with knowledge of eco-friendly management practices. It was observed from Table 3 that fifteen independent variables included in the study could explain 46.40 per cent variation in the knowledge level of eco-friendly management practices by cotton growers. Out of fifteen variables considered, only two variables namely, achievement orientation and risk orientation were found to be positively significant in influencing the knowledge of eco-friendly management practices by cotton growers. Hence, these two variables could be termed as good predictors of the knowledge of eco-friendly management practices by cotton growers.

This indicated that the selected variables could explain forty six per cent of the variation in the knowledge and remaining forty four per cent variation could be attributed to some other variables which were not indicated in the study. The significant change in the knowledge of farmers towards eco-friendly management practices by cotton growers can be brought about by

bringing positive changes in these two significantly contributed variables. This leads to the conclusion that achievement orientation and risk orientation had significantly contributed to increase in knowledge of eco-friendly management practices by cotton growers. In order to gain insight into path through which the independent variables exert influences both directly and indirectly, path analysis was carried out. The data presented in Table 4 revealed that risk orientation exerted the maximum (0.1342) positive direct effect, while scientific orientation exerted the least positive direct effect. The other factors exerting significant amount of positive direct effect were achievement motivation and mass media use. The maximum direct negative effects were exerted by land holding and economic motivation respectively.

Economic motivation (0.1914) showed the maximum positive indirect effect and deferred gratification (0.0204) showed the minimum positive indirect effect. The other variables which contributed favourably and positively were institutional participation (0.1820), scientific orientation (0.1617) and annual income (0.1560). Further, it was also evident from the results that out of 30 substantial indirect effects, twelve passed through the variable risk orientation, five passed through achievement motivation and mass media and three each passed through cosmopolitaness and extension participation, five each passed through

Table 3: Multiple regression analysis of fifteen independent variables towards knowledge of eco-friendly management practices by cotton growers (n=160)

Code No.	Characteristics	Regression coefficient	Standard error	't' value
X ₁	Age	- 0.0012	0.0229	- 0.0544
X ₂	Education	0.1367	0.1870	0.7310
X ₃	Land holding	- 0.1387	0.1334	-1.0396
X ₄	Annual income	0.0931	0.0751	1.4357
X ₅	Achievement motivation	0.1440*	0.0345	1.9623
X ₆	Innovative proneness	0.0871	0.0690	1.2631
X ₇	Scientific orientation	0.0846	0.0172	1.1878
X ₈	Risk orientation	0.2359**	0.0656	2.6531
X ₉	Deferred gratification	0.0587	0.0502	1.1709
X ₁₀	Cosmopolitaness	0.1598	0.1571	1.0174
X ₁₁	Economic motivation	- 0.0136	0.0499	- 0.2735
X ₁₂	Attitude towards chemical fertilizers	0.0202	0.0300	0.6714
X ₁₃	Extension participation	0.0318	0.1900	0.1671
X ₁₄	Institutional participation	0.0847	0.2082	0.4067
X ₁₅	Mass media use	0.1577	0.1222	1.2904

$R^2 = 0.4640$; F value = 2.0321*; DF= (15,145)

* Significant at 5 per cent level; ** Significant at 1 per cent level

Table 4: Path co-efficient showing direct, indirect and substantial indirect effects of independent variables on dependent variable – knowledge of eco-friendly management practices by cotton growers

Code No.	Dependent variables	Direct effect	Total indirect effect	Substantial indirect effect through	
				1	2
X ₁	Age	0.0401	0.0512	0.0405X ₈	0.0272X ₅
X ₂	Education	0.0684	0.0318	0.0193X ₈	0.0118X ₁₃
X ₃	Land holding	-0.0642	0.0836	0.0248X ₆	-0.0134X ₅
X ₄	Annual income	0.0232	0.1560	0.0892X ₈	0.0135X ₁₅
X ₅	Achievement motivation	0.1245	0.0597	0.0401X ₈	0.0235X ₅
X ₆	Innovative proneness	0.0891	0.1168	0.0228X ₈	0.0196X ₁₀
X ₇	Scientific orientation	0.0107	0.1617	0.0213X ₈	0.0211X ₁₀
X ₈	Risk orientation	0.1342	0.1016	0.0726X ₁₂	0.0174X ₁₅
X ₉	Deferred gratification	0.0921	0.0204	0.0355X ₁₀	0.0338X ₁₅
X ₁₀	Cosmopoliteness	0.0832	0.0831	0.0103X ₈	0.0071X ₅
X ₁₁	Economic motivation	-0.0402	0.1914	0.0214X ₈	-0.0143X ₁₅
X ₁₂	Attitude towards chemical fertilizers	0.0462	0.1391	0.0167X ₈	0.0109X ₁₃
X ₁₃	Extension participation	0.0281	0.1376	0.0182X ₈	0.0058X ₅
X ₁₄	Institutional participation	0.0241	0.1820	0.0207X ₈	0.0065X ₁₃
X ₁₅	Mass media utilization	0.1194	0.0774	0.0219X ₈	0.0217X ₁₅

Out of 30 substantial effects, 12 passed through the variable X₈, 7 passed through X₅, 5 passed through X₁₅ and 2 each passed through X₁₃ and X₁₁, 1 each passed through X₆ and X₁₂

innovative proneness and institutional participation. The greater the number of indirect effects passing through a variable indicates that this variable is important in affecting the knowledge level of cotton growers towards eco-friendly management practices.

CONCLUSION

More than fifty per cent of respondents had medium level knowledge about eco-friendly management practices in cotton. Hence, it is of immediate need to train farmers regarding importance of eco-friendly management practices. Hence to create awareness in these practices there is a need to organize effective extension activities like regular training programmes, demonstrations, campaigns and regular farmers' meetings by the State Departments and other development departments concerned.

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Exploring Market Opportunities for Smallholder Vegetable Growers the Case of Maynugus Irrigation Scheme, Tigray Regional State, Ethiopia

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ABSTRACT

This study was initiated to explore market opportunities for smallholder vegetable growers of Maynugus irrigation scheme in Laelay Michew Woreda, Central Zone of Tigray Region. The objective of the study was, to describe market channel of vegetable producers, to analyze the determinants of vegetable quantity supply in the study area and identify the major constraints and opportunities of vegetable marketing system in the study area. The data was collected from smallholders using pre-tested interview schedule, and the researcher used checklists to gather information from officers of the community and traders. This was supplemented by secondary data collected from different published and unpublished sources. Multiple linear regression econometric model was employed to analyze the determinants of vegetable quantity supply after testing goodness of fit by link test and assumptions imposed on model by different methods. The result obtained from this analysis indicates that amount of vegetable produce in and family active labor force were found to be the most important significant variables influencing positively whereas, distance to the nearest road was found significant variable influencing negatively vegetable marketable supply in the study area. The market channel description of the vegetable indicates a very short route. The main market participants of the vegetable marketing of the study area during the survey period were wholesalers and retailers. Besides, a significant amount of 31.4 per cent vegetable produced was channelled directly to consumers from producers. Major problems of the vegetable marketing identified and prioritized by vegetable producer smallholders in the study area were price instability, absence of marketing cooperatives, lack of market information, lack of storage, lack of extension, and lack of marketing contract arrangements. However, high demand of vegetable products, availability of the irrigation scheme, prolonged fasting period of Orthodox Christians and increase the price of substitute goods were the opportunities assessed by smallholder vegetable growers in the study area. Based on the study results, interventions demanded to raise marketable supply of vegetables produced are recommended.

Keywords: Smallholder, Vegetable marketing, Multiple linear regression model

INTRODUCTION

Smallholder agriculture is essential to livelihoods of many rural households in developing and transition economies. In addition, opportunities for profitable commercial agriculture were observed in growing demand, emerging food preferences and intensive farming. Ethiopia's economy is heavily dependent on agriculture. It accounts for about half of GDP, 90% of exports, and 85% of total employment (Jema, 2008). Abadi (2006) reported that more than 85% of its population, residing in the rural area, is engaged in agricultural production as a major means of livelihood. Moreover, Haileselassie (2011) described, conditions in Ethiopia make it achievable to cultivate virtually all tropical, sub-tropical and temperate horticultural crops.

However, the agricultural productivity is low due to use of low level of improved agricultural technologies, risks associated with weather conditions, diseases and pests, etc. Mithofer and Waibel (2011) indicate vegetables are a crucial component of agricultural farming systems in Africa. FAO & WHO (2004) stated, fruit and vegetables are an important component of a healthy diet. The World Vegetable Center (2004) point out, these crops play a great role in alleviating poverty, improve health, enhance learning and working capacities of children and adults and improve sustainability of food production systems. The requirement for fresh and processed vegetables is increasing worldwide, putting pressure on domestic and international markets (Mithofer and Waibel, 2011). Also Mwangi and Kimathi (2006)

emphasize that smallholder-based market development requires an increased identification of products presenting a high to intermediate demand growth offering the poor an opportunity to retain a market share. The use of irrigation for the developing countries like Ethiopia use of would significantly improve the level of production where the amount, timing and distribution of rainfall are irregular. In Tigray region Mekelle city, the Axum-Adwa belt and the Raya Valley (covering the Raya Azebo and Alemata Woredas) have the most potential belt for the development of exportable fruits, vegetables, herbs and spices (Haileselassie, 2011). Maynugus irrigation scheme is one out of the potential irrigation scheme which is a major source of water for smallholder vegetable growers which is found around Axum city. Agriculture dominates most developing countries' economies in terms of its contribution GDP, employment and to increase income from agricultural products for poverty alleviation and economic growth. Agricultural marketing is a key driving force for economic development and has a guide stimulating impact on production and distribution of agricultural produce (Rehima, 2006). Vegetable products are among the highly demanded agricultural products to be directly consumable or different value added products. In the study area the high vegetable production and supply to market in the harvest seasons of small-scale vegetable growers could not satisfy the fast growing of market demand both in terms of quality and quantity of the products. However, an efficient utilization of marketing opportunities may give to an increase of market participation of smallholder in the marketable surplus (Jama, 2008). The general objective of this study is to explore market opportunities for smallholder vegetable growers' beneficiaries of Maynugus irrigation scheme.

MATERIALS AND METHODS

To attain the intended objectives of the study the researcher employed both primary and secondary sources of data were employed. Structured interview schedule was used to collect the required data from selected sample households during the study year. Focus group discussion using check lists were used to get information regarding the problems of marketing system from traders and officers of the community. Different published books and un published reports were used as secondary data. In Laelay Michew Districts, there are five potential vegetable grower Tabias (villages). Out of the five the two Tabias namely

Dereka and Dura produce vegetables using micro dam irrigation. However, Dura was the focus of the research due to the long period establishment of the Maynugus dam. The study area was purposively selected in view of the fact that the beneficiaries of Maynugus irrigation scheme cultivate their land 2 or 3 round per year. The total number of beneficiaries of the irrigation scheme is 454 smallholders. Random sampling technique was used to select the sample smallholders and traders.

RESULTS AND DISCUSSIONS

The three identified market channels with their respective percentage is as follows

1. Channel -1 producer-consumer (31.4%)
2. Channel -2 producer-Retailer-consumers (50%)
3. Channel-3 producers-wholesaler-Retailer-consumers (18.6%)

The results depicted in Table 1 disclosed that price instability, absence of marketing cooperatives and lack of market information were the main problems facing in the market system accounting 46.2 per cent, 34.4 per cent and 9.09 per cent, respectively. The rest percentage encompassed lack of storage, lack of extension, and lack of marketing contract arrangements accounting 6.06 per cent, 2.27 per cent and 1.89 per cent, sequentially. However, all sampled smallholder farmers used nothing control mechanism to come up with solutions to the above problems. The key informants of the community also discussed lack of marketing cooperatives as a great problem as because the others problems migrates from it. And the same to that, establishment of these marketing cooperatives will block all problems.

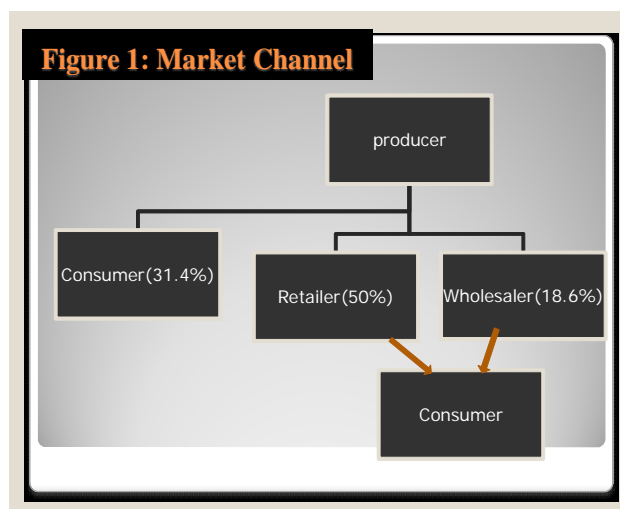


Figure 1: Market Channel

Furthermore, the chairman of the Tabia and some key informants have reported to the concerned body to establish cooperatives but no attention was given yet.

Table 2 summarized the basic opportunities assessed and prioritized by smallholder vegetable producers during the survey period for high demand of the vegetable products accounted the largest share of the total holds 50.8 per cent, availability of the irrigation scheme, prolonged fasting period of orthodox Christians and increase in the price of substitute goods accounted 29.2 per cent, 13.8 per cent and 6.2 per cent respectively.

A number of active labor forces were expected to influence supply of vegetables to market positively. As it was hypothesized number of active labor force in the study area influenced the smallholder's to supply their vegetables to market at 10 per cent significance level (at probability of $P=0.082$). This portrays that an increase in one additional active labor force of smallholder will increase total sale of vegetable quantity supplied to the market with 1278.4 Birr. This implies as the number of active labor force of family member increases the supply of vegetables to market increases. The result is similar with the finding of (Economics & Social Research Foundation, 2011).

Distance to the nearest road significantly influence

Table 1: Constraints of vegetable marketing system

Problems	Frequency	Percent
Price instability	122	46.2
Lack of marketing cooperatives	91	34.4
Lack of market information	24	9.09
Lack of storage	16	6.06
Lack of extension	6	2.27
Lack of contract arrangement	5	1.89

Table 2: Opportunities of vegetable marketing

Market opportunity	Frequency	Percent
High demand of the vegetable products	66	50.8
Availability of the Irrigation throughout a year	38	29.2
Prolonged fasting period of orthodox Christian	18	13.8
Increase the price of substitute goods	8	6.2

the supply of vegetables to market at 5 per cent (at probability $P=0.022$) significant level exerting negative influence on the supply of vegetables to market. As the number of kilometers the smallholders travel from farm gate to nearest road increases by one kilometer the probability of supplying their vegetable produces to market decreases by Birr 3657.4 total sale of quantity supplied to the market. This implies that those smallholders who are nearest road supply their vegetables produce to market. The amount of vegetable produces highly is determining factor and it was expected to influence supply of vegetable produces to the market.

As it was assumed amount of vegetable produces of smallholders in the study period influenced the smallholders in the study period influenced the smallholders to supply their vegetable produces to the market at 1 significant level (at probability of $P=0.000$). This reveals that an increase in one additional quintal of vegetable produces by smallholders will increase the amount of sales from supply of vegetable produces with 540.9 birr.

CONCLUSION

The study area has a great potential for vegetable production. The results finding disclosed, in the study area there was high amount of production and sales of tomato and onion followed by cabbage, pepper and garlic. However the production of lettuce, carrot, spinach, potato, beetroot and Swiss chard were insignificant in the study area. The findings revealed there was a price shock due to perishable nature of the products specially tomato, cabbage and onion. The research result showed that three market channels were found out, producer to retailer, producers direct to consumer and producer to wholesaler at decreasing order. A significant number of sampled smallholder result revealed that the distance travel from farm gate to the nearest road was a significant factor than the distance from farm gate to the market. Moreover, the determine factors affecting market supply of vegetable a multiple linear regression model analysis was employed 12 explanatory variables considered in the model, three explanatory variables were found to be significant up to less than 10 per cent probability level. These are active laborforce, distance to the nearest road and quantity of vegetables produced.

Based on the findings of the study the following conclusion was drawn. The main problems of vegetable

Table 3: Result of the econometric analysis

Variable No.	Variables	Coefficient	standard error	t-value	P>t
X	Age	20.94328	79.91012	0.26	0.794
X ¹	Sex	-2099.38	2452.044	-0.86	0.394
X ²	Education	-110.1308	574.9958	-0.19	0.848
X ³	Land size	4245.886	3020.468	1.41	0.162
X ⁴	Family labor force	1278.408	727.9813	1.76*	0.082
X ⁵	Number of oxen owned	-467.7878	589.8484	-0.79	0.429
X ⁶	Distance to nearest market	-3034.903	4056.43	-0.75	0.456
X ⁷	Distance to nearest road	-3657.37	1573.359	-2.32**	0.022
X ⁸	Access to market information	-412.3072	1423.076	-0.29	0.773
X ⁹	Access to extension service	2116.283	1445.992	0.146	0.146
X ¹⁰	Access to storage	-1870.488	1699.009	-1.10	0.273
X ¹¹ 12	Amount of total production 2010/11	540.8741	63.27358	8.55***	0.000

marketing were price instability, absence of marketing cooperatives, lack of market information and lack of open ventilated storages. The finding shows up that no cooperative society was in the study area. Hence, this inexistence leads to poor contribution in market stabilizing of the producers output, lack of market information. Above all, to overcome the above constraints it is recommended that farmers should be encouraged to form their own marketing co-operative societies in order to reap the benefit of economies of scale (low handling cost, transportation cost and storage cost). The more the smallholders produce, the more they supply to the market. However, farmers are working under limited plots of land. Hence, increasing production and productivity of vegetable per unit area of land is better alternative to increase marketable supply of vegetables.

Also as the finding revealed that vegetable producers used agricultural inputs (like improved seeds, pesticides and improper insecticides) improper. Introduction of improved varieties, application of chemical fertilizers, using modern technologies, controlling diseases and pesticides should be promoted to increase production in the guidance of extension agent. However, rapid increase in agricultural production can lead to sharp price decline where markets are under-developed. So side by side, market places to sell the produces should be found out. Cultivation and marketing of vegetables demand massive working labor force. Based on the study the number of active labor force influenced the amount of vegetable quantity supplied positively. Hence there is a need to promote the number of labor force by hiring at reasonable wage especially at time of high work load (harvesting). Infrastructure facilities in rural areas play

an indispensable role in marketing of any goods. As the finding showed that the longer the distance of the smallholder farm gate to reach the nearest road has a negative effect in the marketable supply of vegetables. Hence, it is recommended that a corporation of smallholders can bring advantage on economic scale (low handling cost, transportation cost and storage cost). In addition, arranging future market contract with different customers like Aksum University, hotels and restaurants which can take the vegetable produces from the smallholder's farm gate can be a solution.

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Role of Media Mix in Imparting Nutrition Education among Rural Women in Uttarakhand

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ABSTRACT

Women constitute fifty per cent of the world population. They play a positive and constructive role and contribute significantly towards the economic, social and political development of the society. In India more than half per cent of women are suffering from various types of problems due to lack of knowledge, information and education on various nutritional aspects. Even government has initiated various developmental programmes for the welfare of rural women but still half per cent of women are suffering lots of nutrition related problems. The reason for poor outreach was lack of orientation of the functionaries, no community involvement and weak nutrition education. The present study was conducted in two randomly selected villages; viz; Raghavnagar and Gokulnagar, in Rudrapur Block in U.S Nagar district which lies in the Tarai region of Uttarakhand. Seventy five respondents (married women of reproductive age group (15-45) were selected through PPS sampling method. Findings of the study revealed that most of the respondents were middle age group having education up to intermediate level and belonged medium income group. Television and Mobile phone were owned by maximum respondents. Based on the information gaps, media mix has been designed. A package of Puppet show plus Recorded message through mobile phone and Booklet plus power point presentation was used to impart nutrition education among rural women. The findings were very positive as media mix packages were effective in imparting Nutrition Education.

Keywords: Nutrition education, Media mix, Rural women

INTRODUCTION

“Where women are respected there is God’s delight and where they are not, there all work and efforts come to naught” There is no hope of rise for that family or country where they live in sadness. But in India, women project picture which depicts the gravity of total situation, illiteracy, ignorance, non perception of role, shyness, poor health and nutrition, socio economic barriers, low level of development of skill and indifferent socio-economic life style which makes the life of women more pitiable grave. Micronutrient deficiencies are widespread; more than half of the women in the reproductive age group of 15-45 years suffer from under nutrition, micronutrient deficiencies and are anaemic having Vitamin A deficiency and Iodine Deficiency. Maternal Mortality Rate (MMR) was 301 per 1000,000 live births during 2001-03 mainly among pregnant women and under nourished, malnourished women (Patel, 2008). The root cause of nutritional problems is poor nutritional status which is

affected by different factors as poor nutritional education, false food belief, high illiteracy, large family, inadequate food intake, ignorance, improper health services. Among all these factors, nutritional education is one factor by which we can improve women’s health. Nutritional education as surest means of emancipation is not available to large mass. Increase in knowledge can improve people’s lives in myriad way. Besides higher income, better knowledge about nutrition can mean better health even for those who spend less on food (World Bank, 1999). To give Information, Education and Knowledge to rural women media mix should be designed on the basis of needs of rural women (Sharma, 2011). On the basis of these observations and field data, the present research was conducted with following specific objectives: (1) To study socio-economic and communication characteristics of rural women, (2) To determine the relative effectiveness of media mix in imparting nutritional education, (3) To compare effectiveness of the media mix in imparting nutritional education.

MATERIALS AND METHODS

The research study was carried out in the Rudrapur block of Udham Singh Nagar District in Uttarakhand by selecting Raghavnagar village purposively. 75 rural women (married women of reproductive age group (15-45) from Raghavnagar and Gokulnagar village were enrolled from PPS Sampling method. A package of Puppet show plus Recorded message through mobile phone and Booklet plus power point presentation was used to impart Nutrition Education among rural women. Interview schedule and knowledge test was used to collect data. Knowledge test was developed on the topic of **“Balanced Diet for Pregnant Women”**. The sub topics were Micronutrient deficiencies and Importance of Nutrients. Pre and post test was taken through this knowledge test.

RESULTS AND DISCUSSION

Age: As revealed in table 1, all the respondents were in the age group of 15 to 45 years. Since 15-45 years age group is considered to be active reproductive age of women, all the women under study belonged to this age group. Maximum number of respondents (45.33 per cent) belonged to middle age group (25-35 years) followed by older age group (40 per cent) whereas, only 14.66 per cent respondents belonged to young age group (15-25 years).

Education: Data revealed that maximum number of respondents (48 per cent) had completed education up to intermediate level while 17.33 per cent respondents could only read and write. A limited number of respondents (9.33 per cent) had studied graduation and above. Still, one fourth of the respondents (25.33 per cent) were found to be illiterate.

Caste: The data in Table 1 revealed that maximum respondents (45.33 per cent) belonged to Other Backward Caste followed by Schedule Caste (26.66 per cent) and Schedule Tribe (14.66 per cent). Only 13.33 per cent respondents were of general caste.

Income: As revealed in table 1 reveals that 33 women who were gainfully employed; majority of them (76.66 per cent) fell in the category of low or medium income level. This is attributed to the fact that those women who were gainfully employed were engaged in low or medium salaried occupations as already discussed earlier.

Media ownership: From the perusal of table 1, it can be inferred that a high majority of the respondents (92

per cent) owned television followed by print media (89.33 per cent) and mobile phone (86.66 per cent). Whereas, radio, landline telephone and internet were possessed by only twelve, eleven and one respondents respectively. It is very clear from table 1 that majority of the respondents (92 per cent) owned television with a cable connection. A high majority of respondents had subscribe print media (89.33 per cent). Among them, 68.00 per cent respondents were subscribers of magazines such as *Vanita, Sarita, Grihashobha, Manorama, Manohar Khaniya* whereas, almost one fifth of the respondents (21.33 per cent) were buying newspapers such as *Amar Ujala, Danik Jagran, Panjab Kesari etc.* Majority of respondents (86.66 per cent) owned mobile phones followed by radio (16 per cent) and telephone (14.66 per cent). Only one respondent owned computer having internet facility. It was interesting to note that in spite of living in rural area; computer with internet facility was there in one of the households in village Gokulnagar. The media ownership reveals an interesting

Characteristic	Number of respondents	Percentage
Age		
Young (25-35)	11	14.66
Middle (35-45)	34	45.33
Old (45-above)	30	40
Education		
Illiterate	19	25.33
Can read and write	13	17.33
Up to intermediate	36	48.00
Graduate and above	7	9.33
Caste		
General	10	13.33
Other Backward Caste	34	45.33
Schedule Caste	20	26.66
Schedule Tribe	11	
Income level		
Low (Less than Rs 1500/	10	13.33
Medium (Rs 1500	21	63.33
High (More than Rs 3000/	2	6.06
Media Ownership		
Radio	12	16.00
Television	69	92.00
Newspaper	16	21.33
Magazine	51	68.00
Telephone	11	14.66
Mobile	65	86.66
Computer	1	1.33

Paired ‘t’ test was computed to compare the significant difference in pre and post knowledge level of respondents with in the treatment groups.

Table 2: Paired 't' test for Relative Effectiveness of Media Mix with in the Group

Treatment group	Σd	d^2	d	$S(d)$	't' cal
T_1	529	8684	13.84	0.98	14.08*
T_2	371	5685	10.02	1.47	6.81*

*Indicate that value is Significant at 5% level; 't' tab = at 5% level of significance =1.684; T_1 = Booklet plus Slide presentation
 T_2 = Puppet show plus Recorded message through Mobile phone

Table 3: Mean score of pre test and post test within the group

Treatment group	Pre test score (X_1)	Post test score (X_2)	Gain ($X_2 - X_1$)
T_1	18.5	32.73	14.23
T_2	19.94	29.29	9.35

situation that out of 75 respondents, majority of women possessed modern media that is mobile, print media as well as electronic media. There is high availability of media due to information revolution in the world.

The calculated 't' value was compared with the tabulated value. The calculated value of 't' is greater than the table value. It is very much visible in table 2 that there existed a significant difference at 5 per cent level with in the group treated with media mix. Thus, null hypothesis that the gain in knowledge of the respondents is not increased after applying treatment is rejected for both treatment groups and the alternate hypothesis that gain in knowledge score is more than the pre knowledge score is accepted in both the groups. It was concluded that the treatment had significant effect in terms of gain in knowledge. Respondents' knowledge was increased after applying the treatment. The mean gain scores are different in following table. This is supported by the findings of Bishnoi and Ahmed (2006) who found that there was significant difference in the pre and post test scores of overall knowledge of the respondents.

There was significant difference in the pretest and post test scores of overall knowledge of the respondents as calculated 't' value was significant. Women had poor initial knowledge about balanced diet as indicated by low score that is T_1 18.5 and T_2 19.94 in pre test. Tremendous improvement in the knowledge of the respondent was evident due to their participation as their post-test score increased from 18.5 to 32.73 in T_1 group and 19.94 to 29.29 in T_2 group. The gain was 14.23 in T_1 group and 9.35 in T_2 group. From the overall view, it can be concluded that respondents got higher knowledge scores after administering media mix. It was

found that media mix was effective to increase the knowledge level of the respondents.

After applying paired t test it was found that there existed a significant difference with in the group. Knowledge is increased after applying treatment. 't' test was computed to compare the relative effectiveness of selected media mix and see if there exists a significant difference in gain in knowledge of message exposed through media used in combination.

It is evident from Table 4 that there exists quite a significant difference in gain in knowledge due to various treatments. Here, when calculated value of 't' was compared with tabulated value of 't', the former was far greater than latter. Thus, the null hypotheses that all selected media are equally effective with respect to gain in knowledge was rejected. It can therefore, be concluded that different treatments differ significantly with respect to gain in knowledge. A different combination of media differs in their effectiveness in

Table 4: 't' test for comparing relative effectiveness of media mix between the groups

T_1	T_2
$X_1 = 32.73$	$X_2 = 29.29$
$N_1 = 38$	$N_2 = 37$
$\Sigma X_1 = 1244$	$\Sigma X_2 = 1084$
$\Sigma X_1^2 = 41758$	$\Sigma X_2^2 = 33502$
$(\Sigma X_1)^2 = 1547536$	$(\Sigma X_2)^2 = 1175056$
$S_1^2 = 40.09$	$S_2^2 = 48.43$
$S = 6.68$	
't' cal = 2.35*	

* Indicate that value is Significant at 5% level.
't' tab = at 5% level of significance =1.980

carrying of message and performs various functions. For the purpose of comparisons, the mean of two groups were ranked from highest to the lowest as presented in table 5 that booklet plus slide presentation was more effective than puppet show plus recorded message through mobile.

Table 5: Ranking of the treatments according to mean gain scores in knowledge

Groups	Mean gain score	Rank
T ₁	32.73	I
T ₂	29.29	II

T₁ = Booklet plus Slide presentation

T₂ = Puppet show plus Recorded message through Mobile phone

It was revealed that the mean of the group which had the treatment with booklet plus slide presentation and the mean of the group which had the treatment with puppet show plus recorded message through mobile were different. In the comparison between booklet followed by slide presentation and puppet show followed by recorded message through mobile phone, it was discovered in those two comparisons that groups which had treatment with booklet plus slide presentation had higher mean gain scores than the aids in which puppet show and recorded message was used. It could be concluded that booklet plus slide presentation is more effective as compared to puppet show plus recorded message through mobile phone. Thus, two media differ in their effectiveness. The findings are in accordance with that of Grenholm (1979) who reported that print had a unique power to be read again and again and added that longevity of print is more than the recording of radio.

CONCLUSION

The study was confined to rural women of Uttarakhand. The main emphasis of the study was to assess the effectiveness of media mix and that type of media mix is effective for imparting nutritional education to rural women. On the basis of findings, it can be concluded that majority of the respondents were of middle age group, literate, housewives, lower caste. Majority of respondents possessed television and mobile phones. They mainly used these media for entertainment purposes. Media mix, Booklet plus slide presentation was more effective as compare to Puppet show plus recorded message through mobile phone. It can be concluded that respondents have gained more scores in case of Booklet plus slide presentation media mix. Education, occupation, social participation were positively and significantly related with gain in knowledge.

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Impact of SHG on Socio-economic Development of Their Members

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ABSTRACT

Women are a vital part of the Indian economy, both at the national and household level. Though, our constitution has provided the equal rights and opportunities to both men and women in the political, economic and social spheres and it also prohibits any kind of discrimination against women, the women resource particularly rural is not actively engaged in the development process. The SHGs are the most powerful tool of socio-economic development of the poor women in rural areas. In India, SHGs are organized especially for microfinance and micro enterprise development. With a view to help in understanding the internal structure, nature, resources and their functioning, the present study was undertaken. The impact of self-help group was studied on seven dimensions i.e. change in income, change in occupation, change in thrift habit, change in social participation, change in expenditure, change in decision making and change in confidence level, which show the significant changes with personal and socio-economic characteristics of members. The study delineates that there was a medium impact on the majority of the SHG members (55.33 per cent) followed by low and high impact on the 25.33 per cent and 19.33 per cent members respectively.

Keywords: Self help group, Impact on socio-economic development

INTRODUCTION

Poverty and unemployment are the major problems of under developed countries to which India is no exception. The rate of illiteracy and low economic status of people underline the need for increasing their earning power by providing them income generating assets. Women are a vital part of the Indian economy, both at the national and household levels. In order to have a fast development, the rural women are being equipped with the needed empowerment through self help groups. In India the organization of self help groups especially for micro finance and micro-enterprise development programmes constitute a widely accepted development strategy for poverty reduction. Now a day's SHGs are fast emerging as powerful tool of socio-economic development of the poor in rural areas. Emancipation of women is not an act of charity but is a fundamental necessity.

The need of the present study is an outcome of the thinking that it will help in understanding the internal structure, nature, resources and their functioning. The social and economic variables and other dimensions of SHG which will help in mobilizing the SHG to have a sustained development it was felt necessary to undertake

the study on "Impact of self-help group on socio-economic development of their members" with the following specific objectives.

1. To study the personal and socio-economic characteristics of the members.
2. To assess the impact of self help group on the socio-economic development of their members
3. To find out the relationship between personal, socio-economic characteristics and the impact of self help group.

MATERIALS AND METHODS

The present study was carried out in the Beed district of Marathwada region of Maharashtra state. Three talukas namely Beed, Majalgaon and Ambajogai were randomly selected. Five self help groups from each selected taluka and ten women members from each selected SHG were randomly selected to constitute a sample of 150 respondents. Personal interview technique was used for data collection. Selected respondents were contacted at their homes either in the morning or in the evening. Frequency and percentage were used for making simple comparisons. The relationship between the independent and dependent variable was established by calculating the coefficient of correlation.

RESULTS AND DISCUSSION

Majority (64.66 per cent) of the respondents were from the young age group (up to 35 year), 36.00 per cent of SHG members were illiterate and 22.00 per cent and 21.33 per cent were having primary and secondary education respectively. Most of the members (54.66 per cent) had medium family size. Regarding their annual income per cent women member in SHG were below poverty line (up to Rs. 18,000). Almost sixty percent of the respondents (59.33 per cent) had medium use of source of information. About 54.00 per cent member were having house work + labour + small scale business as their occupation. More than 50 percent of SHG members (53.33 per cent) had medium level of social participation.

The impact of self help group on socio-economic development of their women members was studied by considering seven dimensions as below.

The results of change in income of respondents presented in Table 1 indicates that 90.00 per cent of the members had changed their annual income ranging from Rs. 10,001-20,000/- and the same percentage of respondents towards negative direction had observed in the category upto Rs. 10,000/- after joining the SHG. Finding are similar to Gangaiah *et al.* (2006).

The data presented in Table 2 delineate that 40.67 per cent of the respondents could have change in their occupation as house work + labour + small scale business after joining the SHG, as a result they generated additional occupation for themselves and their family members such as poultry, goat rearing, cattle rearing, dairying, tailoring, cottage industries etc. whereas 38.66 per cent of the respondents had changed towards negative side their house work + labour as an occupation, 33.33 per cent changed their occupation as housework + labour + social work, 8.00 per cent changed as house work + small scale business, while 8.6 per cent had not changed in their house work occupation by respondent due to joining the SHG.

It was noticed from Table 3 that all the respondents had a change in their thrift habit after joining the self help group and as a result they started saving in self help group and developed a regular saving habit, followed by 4.00 per cent change in saving at home, 2.00 per cent of them had saving in jewellery and in L.I.C., respectively. No body had made their saving in postal schemes before and also after joining SHG. It is observed from the Table 4 that 100 per cent change was occurred in the participation of members in SHG followed by 4.66 per cent change in the participation in Bhajni Mandal and Mahila Mandal respectively only 2.00 per cent change

Table 1: Distribution of the respondents according to their change in income

S.No.	Category	Before		After		Impact	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1.	Up to 10,000	143	95.33	8.00	5.30	-135	90.00
2.	10,001-20,000	7	4.66	142	94.66	135	90.00
3.	20,001-30,000	0	0	0	0	0	0
4.	Above 30,000	0	0	0	0	0	0

Table 2: Distribution of respondents according to their change in occupation

S. No.	Category	Before		After		Impact	
		Frequ-ency	Perce-ntage	Frequ-ency	Perce-ntage	Frequ-ency	Perce-ntage
1.	House work	13	8.6	13	8.6.0	0	0
2.	House work +labour	100	66.66	42	28.00	-58	38.66
3.	House work + labour + small scale business	20	13.33	81	54.00	61	40.67
4.	House work + small scale business	2	1.3	14	9.30	12	8.00
5.	House work + labour social work	0	0	50	33.33	50	33.33
6.	House work small scale business + Social work	0	0	5	3.30	5	3.33
7.	Social work + small scale business	0	0	0	0	0	0

Table 3: Distribution of respondents to according their change in thrift habit

S. No.	Category	Before		After		Impact	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1.	Saving at home	9	6	15	10	6	4.00
2.	Fixed deposit	0	0	0	0	0	0
3.	SHG	0	0	150	100	150	100
4.	Jewellery	5	3.3	8	5.3	3	2.00
5.	L.I.C.	4	2.6	7	4.6	3	2.00
6.	Post	0	0	0	0	0	0

Table 4: Distribution of the respondents according to their change in social participation

S. No.	Category	Before		After		Impact	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1.	Bhajni Mandal	4	2.6	11	7.3	7	4.66
2.	Mahila Mandal	1	0.6	4	2.6	3	2.00
3.	Aanganwadi	0	0	0	0	0	0
4.	Co-operative society	0	0	0	0	0	0
5.	Grampanchayat	0	0	0	0	0	0
6.	Panchayat samitee	0	0	0	0	0	0
7.	Zilla parishad	0	0	0	0	0	0
8.	Sheti Vidnyan Mandal	0	0	7.0	4.6	7	4.60
9.	S.H.G.	0	0	120	80	150	100

Table 5: Distribution of respondents according to their change in expenditure behaviour

S. No.	Category	Before		After		Impact	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1.	Food	150	100	150	100	0	0
2.	Clothing	150	100	150	100	0	0
3.	Material possession	90	60	150	100	60	40.00
4.	Medicine	70	46.66	150	100	80	53.33
5.	Education	55	36.66	150	100	95	63.33

was found in Sheti Vidnyan Mandal and there was no change in the social participation in Anganwadi, Co-operative Society, Grampanchayat, Panchayat Samiti and Zilla Parishad as a result of joining SHG.

The data depicted in Table 5 revealed that 63.33 per cent change in expenditure on education, 53.33 per cent change in expenditure on medicine and 40.00 per cent change in expenditure on material possession were observed by the respondents, whereas there was no change in the expenditure on food and clothing after joining the SHG. Results are similar to Kore (2005). The data in Table 6 revealed that 63.33 per cent change in the value of decision making about traveling, 53.33 per cent change in the value of decision making about material possession, 26.66 per cent change in the value

of decision making about celebration of festival, 16.66 per cent change in the value of decision making about child rearing and 10.00 per cent change in the value of decision making about increase in property was observed among the members after joining SHG.

It can be delineated from Table 7 that 93.40 per cent change in confidence level of members with observed in that contact with unknown person 80.00 per cent change in confidence level with Government servant and Government institutions contact respectively, 73.33 per cent change in confidence level with transaction in banking, 48.66 per cent change in confidence level with social welfare and 26.66 per cent change in confidence level was found in conference speaking.

Table 6: Distribution of respondents according to their change in the value of decision making

S. No.	Category	Before		After		Impact	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1.	Material possession	50	33.33	130	86.66	80	53.33
2.	Child rearing	75	50.00	100	66.33	25	16.66
3.	Celebration of festival	10	6.60	50	33.33	40	26.66
4.	Increase in property	5	3.30	20	13.33	15	10.00
5.	Travelling	15	10.00	110	73.33	95	63.33

Table 7: Distribution of respondents according to their change in confidence level

S. No.	Category	Before		After		Impact	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
A)	Contact with people						
1.	Unknown person	10	6.60	150	100	140	93.40
2.	Govt. servant	30	20.00	150	100	120	80.00
3.	In conference speech	0	0	40	26.66	40	26.66
4	Social welfare	0	0	65	43.33	65	43.33
B)	Contact with Institution						
1.	Transaction in Banking	0	0	110	73.33	110	73.33
2.	N.G.O.	15	18.00	100	66.66	85	48.66
3.	Govt. Institution	0	0	120	80.00	120	80.00

Table 8: Distribution of respondents according to the impact of SHG as a whole

Category	Frequency	Percentage
Low	38	25.33
Medium	83	55.33
High	29	19.33
Total	150	100.00

Table 9 : Relationship of independent variables with impact of SHG

Independent variables	Correlation coefficient (r)
Age	-0.029 ^{NS}
Education	0.0087 ^{NS}
Size of family	-0.016 ^{NS}
Annual income	0.030 ^{NS}
Sources of information	0.126 ^{NS}
Occupation	0.268**
Social participation	0.353**

**Significant 1% level; NS = Non-significant

Table 8 delineates that a medium impact was found on the majority of the SHG members (55.33 per cent) followed by low and high impact on the 25.33 per cent

and 19.33 per cent members respectively (Anjugam and Alayumani, 2001). It is revealed from Table 9 that occupation and social participation were positively and significantly correlated with the impact of SHG. The variables like age, education, family size, annual income and source of information could not show any relation with impact of SGH on socio-economic development of their members.

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Women Empowerment through Self Employment in Dairying Activities: Motivating Factors and Constraints

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ABSTRACT

Motivation in general is an important determinant of entrepreneurial growth through self employment. Motivators related to initiation, growth and development of enterprise run by rural women can be categorized as work, social, personal and economic core. Pertaining to work core, “to get complete satisfaction of being productive member of family” was found to be the major motivating factor. The analysis pertaining to social core revealed that “Want to be an economically independent person” emerged as first motive that accelerated women for self employment. Among individual core motives, it was found that women started their enterprise because they wanted to utilize their available time” followed by “Want to provide comfortable life to family members”. Want to save for marriage of children and for education of the children were found to be the main economic core motives for starting their own enterprise by rural women entrepreneurs. The self motivation has always been a dominating source because women even in ordinary families have started feeling an increased financial burden, great awareness towards their potentialities, standard of living and better education of their children etc. Most of the respondents were morally boosted by their spouses. Relatives and friend also played a significant role in encouraging them morally. Lack of knowledge about agencies/institutions working for women entrepreneurs was reported to be the major constraint by all the women entrepreneurs. Lack of information about governmental schemes for women entrepreneurs and lack of knowledge regarding machinery and equipment to be used in dairying were the major financial and resource constraints. Lack of social contacts, multiple responsibilities, and male dominance were the major socio – psychological constraints. The major technical constraint reported by all the women entrepreneurs was lack of technical know how.

Keywords: Women empowerment, Self-employment, Motivation, Constraints

INTRODUCTION

Women in India are playing a big role in agriculture and related activities like animal husbandry, poultry, fisheries and handicraft and thus contributing to the economy. There is a need to develop women not only for the sake of development of the country but also development of women for women’s welfare, development and thus empowerment. Employment gives economic status to women, economic status gives way to social status and thereby empowerment to women. In India entrepreneurship and self-employment are often used synonymously without losing the sight that all entrepreneurs are self- employed but all self- employed persons may not necessarily be entrepreneurs. The proportion of skilled women in total unemployment is increasing. Hence expanding employment opportunities both to provide income and to harness the growth

potential of educated unemployed women in every important.

It is believed that economic strength is the basis of social, political, psychological power in the society. Thus the lower status of women mostly stems from their low economic status, subsequent dependence and lack of decision making power. Therefore, if women gain economic strength, they gain visibility and voice. In promotion of self- employment, educated women have the additional advantage of catering more jobs for inspiring uneducated women. If entrepreneurship is made socially rewarding for women and encouraged through proper motivation and training as a common human activity, it will definitely induce a steady flow of women entrepreneurs. Almost all low income families /households are economically active in the informal sector. But their major economic roles are often

undervalued and ignored. Women manage household finance in most of the developing world and many household are headed by women relying on the women's earnings as the main or sole source of income for the family. Still women entrepreneurs are operating in isolation, lack confidence to change their fate. Women do most of the work, but have a very small share of the physical and financial assets. Their difficulties in achieving success and expending economic participation are related both to gender and poverty.

In today's world importance is given to the economic development of women through self-employment or entrepreneurship. Entrepreneurship needs different characteristics and factors for successful achievement of target and programmes and policies designed keeping in mind the profile of women entrepreneurs. Entrepreneurship can help women's economic independence and improve their social status. Automatically the women get empowered once they attain economic independence. The development of women entrepreneurship enables society to understand and appreciate their abilities. It enhances their status and leads to integrations of women in nation building and economic development. It provides the needed psychological satisfaction and imbibes a deep sense of achievement to create their enhanced identity in society.

MATERIALS AND METHODS

The present study was aimed at studying motivational factors and constraints faced by self-employed women engaged in dairying activity at Tarai and Hill region of Uttarakhand with descriptive research design. The multi stage purposive random sampling design was used to select the study area and respondents. The total sample size was 240 women entrepreneurs engaged in dairying activities. Data was collected personally through interview technique. Data was presented in frequencies, percentage and means. For analyzing various information's "t" and paired "t" test were used. Correlation and multiple regression analysis were carried out to study the relationship of selected variables and to assess their impact. Motivational factors related with work, social, individual and economic core were framed in form of scale having weighted score. The motivational factors were ranked on the basis of scores as highly motivated (49-58), somewhat motivated (39-48), and not motivated (29-38).

RESULTS AND DISCUSSION

Motivation in general is an important determinant of entrepreneurial growth and development in society. However, under the broad spectrum of motivation, certain motives have been found to be significantly related to entrepreneurial behavior of rural women entrepreneurs. Motivations related to work, social, personal and economic core considered in order to assess the extent of motivational forces responsible for initiation, growth and development of enterprise run by rural women.

Pertaining to work core, it was found that "To get complete satisfaction of being productive member of family" got the maximum score with the weighted mean of 1.49 in the total sample. The same statement got I rank in Hill and Tarai both regions with the weighted score of 1.52. The statement "Wanted to prove as best" scored second rank with the weighted mean of 1.20 in total sample, 1.23 in Hill region and 1.18 in Tarai region.

It could be supported with the fact that women were considered a weaker section of the society for centuries together and wanted to come out of the men dominated society with the help of unexploited energies and potentialities. This dominating source of motivation was also reported by Hundel (1977); Singh and Sengupta (1990) and Vidyulata (1990). "Wanted to achieve something usually others do not", scored only 0.03 in total sample, 0.02 in Hill and 0.04 in Tarai region and hence was in least priority of the women entrepreneurs.

The analysis pertaining to social core revealed that "Wanted to be an economically independent person" emerged as first motive with the weighted score of 1.78 for total sample as well as region wise also. "Wanted to be a self earning member" with 1.62 weighted score for total sample, 1.48 score for Hill region and 1.76 score for Tarai region emerged as second ranked motive. These were also found as main source of motivation by some of the researches particularly for self employed workers as reported by Nandy (1973) and Singh (1992) "Wanted to provide goods / service to the people was the motive got least priority by the women.

There were total seven statements belonging to individual core. It was found that women started their enterprise because they wanted to utilize their available time" followed by "Wanted to provide comfortable life to family members" as reported by 53.75 percent and

Table1: Major and minor factors of motivation

S. No.	Decision	Hill region n=120			Wt. mean/ Rank	Tarai region n=120			Wt. mean/ Rank	Total N=240			Wt. mean/ Rank
		Major	Minor	NA		Major	Minor	NA		Major	Minor	NA	
I.	Work Core												
	1. Wanted to complete with other	22(18.33)	57(47.50)	41(0.84)	0.84/III	17(14.17)	58(48.33)	45(37.50)	0.77/III	39(16.25)	115(47.42)	86(35.83)	0.80/III
	2. Wanted to provide as best	61(50.83)	26(21.67)	33(27.50)	1.23/II	59(49.17)	24(20.00)	37(30.83)	1.18/II	120(50.00)	50(20.83)	70(29.17)	1.20/II
	3. To get complete satisfaction of being productive member of family	78(65.00)	19(15.83)	23(19.17)	1.52/I	80(66.67)	22(18.33)	18(15.00)	1.52/I	158(65.83)	41(17.08)	41(17.08)	1.49/I
4.	You wanted to utilize my skill	11(9.17)	21(17.50)	88(73.33)	0.35	9(7.50)	18(15.00)	93(81.67)	0.30	20(8.33)	39(16.25)	181(75.42)	0.33
5.	You wanted to do something creative and innovative	0(0.00)	4(3.33)	116(96.67)	0.03	0(0.00)	6(5.00)	114(95.00)	0.05	0(0.00)	10(4.17)	230(95.83)	0.04
6.	Wanted to achieve something that usually other do not	0(0.00)	3(2.50)	117(97.50)	0.02	0(0.0)	5(4.17)	115(95.83)	0.04	0(0.00)	8(3.33)	232(96.67)	0.03
7.	Wanted to make use of decision making/ problem solving skill more profitably	2(1.67)	58(48.33)	60(50.00)	0.52	2(1.67)	52(43.33)	66(55.0)	0.47	4(1.67)	110(45.83)	126(52.50)	0.49
II.	Social core												
	8. Wanted to prove leadership quality	1(0.83)	11(9.17)	108(90.00)	0.11	2(2.50)	6(5.00)	111(92.50)	0.10	4(1.67)	17(7.08)	219(91.25)	0.10
	9. Wanted to be a self earning member	84(70.00)	9(7.50)	27(22.50)	1.48/II	99(22.50)	13(10.83)	8(6.67)	1.76/II	183(76.25)	22(9.17)	33(14.58)	1.62/II
	10. Wanted to be an economically independent person	96(80.00)	22(18.33)	2(1.67)	1.78/I	101(84.17)	12(10.00)	7(5.83)	1.78/I	197(82.03)	34(14.17)	9(3.75)	1.78/I
11.	Wanted to attain high social status	6(5.00)	21(17.50)	93(77.50)	0.28	9(7.50)	24(20.00)	87(72.50)	0.35	15(6.25)	45(18.75)	180(75.00)	0.31
12.	Wanted to show that I am inferior to none	5(4.17)	84(70.00)	31(25.83)	0.78/III	14(11.67)	81(67.50)	25(20.83)	0.91/III	19(7.92)	165(68.75)	56(23.33)	0.85/III
13.	Wanted to earn respect of the people	12(10.00)	27(22.50)	81(67.50)	0.42	19(15.83)	31(25.83)	70(58.33)	0.56	31(12.92)	58(24.17)	151(62.92)	0.50
14.	Wanted to supply produce to the people	0(0.00)	14(11.67)	106(88.33)	0.12	0(0.00)	11(89.17)	109(90.83)	0.09	0(0.00)	25(10.42)	215(89.50)	0.10
III.	Individual core												
	15. Wanted to acquire wealth for self	2(1.67)	11(9.17)	107(89.6)	0.12	8(6.67)	17(19.17)	95(79.17)	0.28	10(4.17)	28(11.67)	202(84.17)	0.20
	16. Wanted to be an owner to employed	7(5.83)	12(10.00)	101(84.17)	0.22	12(10.00)	15(12.50)	93(77.50)	0.32	19(7.92)	27(11.25)	194(80.83)	0.27
	17. Wanted to provide comfortable life to family members	67(55.83)	16(12.50)	38(31.67)	1.24/II	72(60.00)	12(10.00)	36(30.00)	1.30/II	139(57.92)	27(11.25)	74(30.83)	1.27/II
18.	Wanted to get over to the monotony of daily routine	0(0.00)	92(76.67)	28(23.33)	0.77	0(0.00)	95(79.17)	25(20.83)	0.79	0(0.00)	187(77.92)	53(22.08)	0.78
19.	Wanted to utilize available time	68(56.67)	32(26.67)	20(16.66)	1.40/I	61(50.83)	39(32.50)	20(16.67)	1.34/I	129(53.75)	71(29.58)	40(16.67)	1.37/I
20.	Wanted to utilize available resources	10(8.33)	96(80.00)	14(11.67)	0.97/III	8(6.67)	98(81.67)	14(11.67)	0.95/III	18(7.50)	194(80.83)	28(11.67)	0.98/III
21.	Wanted to gain a sense of achievement	6(5.00)	87(70.00)	30(25.00)	0.80	19(15.83)	75(62.50)	26(21.67)	0.94	25(10.42)	159(66.25)	56(23.33)	0.87
IV.	Economic core												
	22. Wanted to overcome with shortage of money in the family	99(82.50)	21(17.50)	0(0.00)	1.82/III	89(74.17)	31(25.83)	0(0.00)	1.74/III	188(78.23)	52(21.67)	0(0.00)	1.78/III
	23. Wanted to add family wealth	73(60.83)	32(26.67)	15(12.50)	1.48	75(62.50)	35(29.17)	10(8.33)	1.54	148(61.67)	67(27.92)	25(10.42)	1.57
	24. Wanted to get best monetary returns for animal stock	75(62.50)	36(30.00)	9(7.50)	1.55	76(63.33)	38(31.67)	6(5.00)	1.58	151(62.92)	74(30.83)	15(6.25)	1.57
25.	To supplement the family income	97(80.83)	23(19.17)	0(0.00)	1.81	82(68.33)	38(31.67)	0(0.00)	0.00	179(74.58)	61(25.42)	0(0.00)	1.74
26.	To ensure financial stability for future	82(68.33)	24(22.00)	14(11.67)	1.57	85(70.83)	79(65.83)	16(13.33)	1.56	167(69.58)	43(17.92)	20(8.33)	1.57
27.	Wanted to save for education of children	111(92.50)	9(7.50)	0(0.00)	1.92/II	99(82.50)	12(10.00)	9(7.50)	1.75/II	210(87.50)	21(8.17)	9(3.75)	1.84/II
28.	For marriage of children	114(95.00)	6(5.00)	0(0.00)	1.95/I	104(86.67)	16(13.33)	0(0.00)	1.87/I	218(90.83)	22(9.17)	0(0.00)	1.90/I
29.	As old age security	54(45.00)	37(30.83)	29(24.17)	1.21	52(43.33)	26(21.67)	42(35.00)	1.08	106(44.17)	63(26.25)	71(29.58)	1.15

57.92 percent women respectively among the total sample. Majority of women reported that “wanted to get over to the monotony to daily routine” (77.92%), “Wanted to utilize available resources” (80.83%) and “Wanted to gain a sense of achievement” (66.25%) were minor motives for starting the enterprise. It was also revealed from the data that women had not given any priority to acquire wealth for self (84.17%) and to be an owner not employer (80.83%) among the total sample.

“Wanted to save for marriage of children” (90.83%) and “for education of the children” (87.50%) were found to be the main motives for starting their own enterprise for rural women entrepreneurs. There were 78.33 percent women who wanted to overcome with shortage of money in the family and 74.58 per cent women who wanted to supplement the family income hence became major motive for starting own enterprise. Old age security was given least priority by the women. The motivational sources were categorized into three

main group viz. localite, cosmopolite and self-motivated along with two other groups viz., mass media and others. Motivational sources were studied with regard to their contribution in starting enterprise by the rural women entrepreneurs.

The data pertaining to motivational sources revealed interestingly that self motivation was the dominating source for all the rural women entrepreneurs in both the regions. All the women reported increased financial burden, awareness towards self and better education of children as major self-motivating sources to start own enterprise. Among the localite sources of motivation majority of women among total sample (38.75%) reported their family members as major sources of motivation. In Hill region the percentage of such women were more (51.67%) as compare to women of Tarai region (25.83%). In Tarai region majority of women (43.33%) reported their husband as a major source of motivation whereas in Hill region only 11.67 percent women reported that their

Table 2: Motivation sources of rural women entrepreneurs

Sl. No.	Source of motivation	Hill region n= 120		Tarai region n= 120		Total	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1.	Localite						
	(i) Husband	14	11.67	52	43.33	66	27.50
	(ii) Family members	62	51.67	31	25.83	93	38.75
	(iii) Relatives	4	3.33	6	5.00	10	4.17
	(iv) Neighbour	3	2.50	5	4.17	8	3.33
	(v) Friends	28	23.33	24	20.00	52	21.67
	(vi) Others	9	7.50	2	1.67	11	4.58
2.	Cosmopolite						
	(i) Government agencies	2	1.67	6	5.00	8	3.33
	(ii) Others	3	2.50	4	3.33	7	2.92
3.	Self motivated						
	(i) Increased financial burden	0	0.00	0.00	0.00	0.00	0.00
	(ii) Awareness towards self	0	0.00	0.00	0.00	0.00	0.00
	(iii) Better education of children	0	0.00	0.00	0.00	0.00	0.00
	(iv) All the above	120	100.00	120	100.00	240	100.00
4.	Mass media						
	(i) Radio	31	25.83	12	10.00	43	17.92
	(ii) T.v.	68	56.67	69	57.50	137	57.08
	(iii) Books	0	0.00	0	0.00	0	0.00
	(iv) Leaflets/slide	21	17.50	39	32.50	60	25.00
5.	Others						
	(i) High rate and return	23	19.17	28	23.33	51	21.25
	(ii) Social acceptance	27	22.50	30	25.00	57	23.75
	(iii) Ready market	70	58.33	62	51.67	132	55.00

husbands are the major source of motivation for them. For 23.33 percent Hill women and 20 percent women of Tarai region, friends were also reported to be important sources of motivation. The similar findings were also reported by Singh (1992) and Jaiswal (1996). It is discouraging to mention that cosmopolite sources were quite weak in serving as motivational sources. Compare to other sources like motivation Government agencies, banks and other institutions were quite weak inserving as motivational sources.

The trend of motivational forces playing role in the establishment of enterprise was well within the expectation range. The self motivation has always been a dominating source because women even in ordinary families have started feeling increased financial burden, great awareness towards their potentialities, standard of living and better education of their children etc. In addition husbands and family members also realize the need of exploitations of hidden talent of women at this critical juncture of financial development which they alone cannot possibly achieve. The weak score of mass media could have been due to the fact that either they were not effective in their approach probably because of poor communication, advertisement sources and linkages, or the programmes were not of interest to rural masses. Assistance and support proves to be a boon in any kind of endeavors, especially the support received within the household environment plays a vital role. Rural women entrepreneurs too were observed to visualize the pattern of help received within the family.

The data envisaged that most of the respondents among the total sample were morally boosted by their spouses (45.83%). Relatives and friend also played a

significant role in encouraging them morally. Among the total sample 27.50 percent women reported that friends and relatives and provided moral support. Out of these 28.33 percent women were of Hill region whereas 26.67 percent women were of Tarai region.

Economically too their husband extended cooperation to them comparatively more than any other source. The similar trend was followed in technical support. For the marketing aspect relatives and friends were reported to provide cooperation to majority of women. For personal matters support were more or less equally provided by parents, husbands, relatives and friend in both the regions. Almost all the women were not aware about the institutional and governmental support. They also revealed their reluctance to avail the same. Various kinds of constraints as reported by rural women entrepreneurs engaged in dairy were grouped under the sections of socio-personal constraints, financial and resource constraints, socio-psychological constraints and technical constraints.

Lack of knowledge about agencies/institutions working for women entrepreneurs was reported to be the major constraint by all the women entrepreneurs of both the region. This constraint was ranked as I with the weighted mean score of 3.00 in both the regions. Among the constraints of socio-personal section, excessive burden of work and responsibilities was ranked as II with the weight mean score of 2.82 in Hill region and 2.41 in Tarai region. In Hill region, afraid to take risk was ranked as III with the weighted score of 2.65 whereas in Tarai region, lack of confidence in you was ranked as III with the weighted score of 2.40. Lack of confidence was ranked as IV in Hill region with

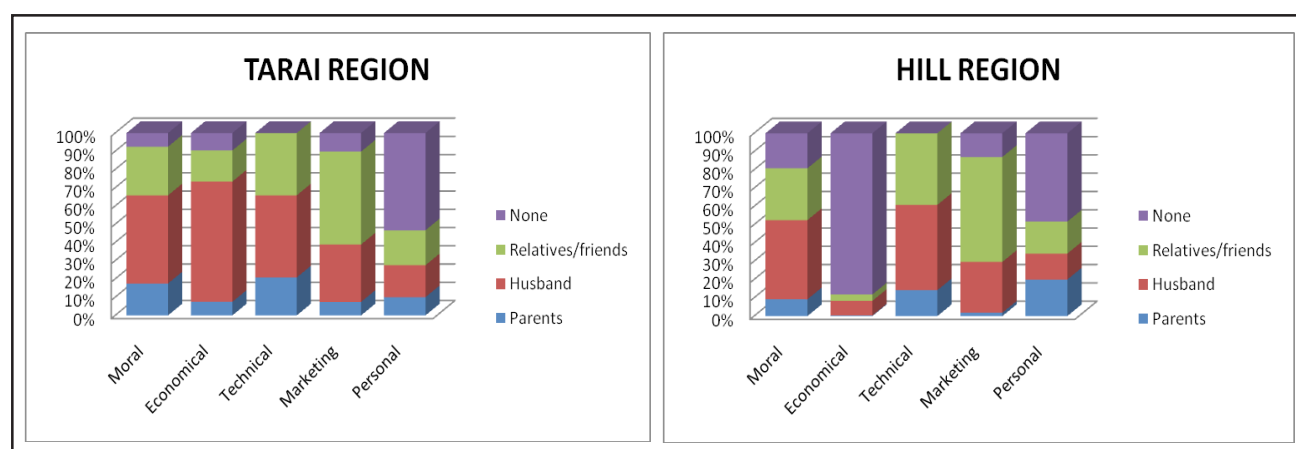


Figure 1: Support Extended To the Rural Women Entrepreneurs by the Family

the weighted score of 2.54 whereas afraid to take risk was ranked as IV with weighted score of 2.22 in Tarai region. In Hill region, excessive tension because of burden of enterprise scored V rank with the weighted score of 2.22 followed by lack of technical knowhow (VI rank with the weighted score of 2.13), unfavorable attitude of family members (VII rank with the weighted score of 2.04), unable to handle managerial abilities (VIII rank with the weighted score of 1.66) and lack of leisure activities in your routine (IX rank with the weighted score of 1.44) respectively.

In Tarai region, unfavorable attitude of the family members scored V rank with the weighted score of 2.15 followed by excessive tension because of burden of enterprise (VI rank with weight score of 2.09), lack of technical knowhow (VII rank with weighted score of 1.96), unable to handle managerial abilities (VIII rank with the weighted score of 1.92) and lack of leisure activities in your routine (IX rank with the weighted score of 1.44) respectively. Lack of information about governmental schemes for women entrepreneurs and lack of knowledge regarding machinery and equipment to be used in dairying were the major financial and resource constraints. These facts as constraints were reported by all the women entrepreneurs of both the regions.

A similar picture of constraints having similar ranking with different weighted score were found in both Hill and Tarai region. Lack of knowledge about good breeds of milch animals was ranked II with weighted score of 2.54 in Hill region whereas with weighted score of 2.58 in Tarai region. The III rank was scored by constraint of lack of proper marketing facilities with weighted score of 2.39 in Hill region and with weighted score of 2.08 in Tarai region.

A mixed pattern of ranks of socio-psychological constraints were found among the women of Hill a Tarai region. Similar rank pattern was found for first four ranks in both the regions. Lack of social contacts ranked I with the weighted score of 2.52 in hill region and 2.49 in Tarai region. Face conflicts due to responsibilities ranked II with the weighted score of 2.41 in Hill region and 2.41 in Tarai region. The III rank was scored by the constraint of male dominance with the weighted score of 2.23 in Hill region and 2.25 in Tarai region. Lack of self-motivation scored IV rank with the weighted score of 2.18 in Hill region and 2.12 in Tarai region.

In Hill region V rank was scored by the constraint i.e. lack of motivation from family and society and lack of confidence in women's ability with weighted score 2.00 for both. Non-cooperative attitude of husband and family members scored VI rank (weighted score 1.99) followed by lack of recognition in family (VII rank and weighted score 1.62), lack of appreciation from family members (VIII rank and weighted score 1.60) and work is not accepted because of not being as per norms of the society (IX rank and weighted score 1.50) respectively.

In Tarai region V rank was scored by the constraint of non-cooperative attitude of husband and family members with the weighted score of 2.04 followed by lack of confidence in women's ability (VI rank and weighted score 2.00), lack of motivation from family and society (VII rank and weighted score 1.96), lack of appreciation from family members (VIII rank and weighted score 1.84), work is not accepted because of not being as per norms of the society (IX rank and weighted score 1.65) and lack of recognition in the family (X rank and weighted score 1.60), respectively.

Lack of technical know how was the major technical constraint as reported by all the women entrepreneurs of both the regions. It was ranked as I with the weighted score of 3.00 in hill as well as Tarai region. Rank II was scored by the constraint of lack of technical aspects of dairying with the weighted mean score of 2.72 in Hill region and 2.32 in Tarai region. In Hill region non-availability of modern technologies was ranked as III with the weighted score of 2.35 followed by lack of specified skills (rank IV and weighted score 2.14) and lack of transportation facilities (rank V and weighted score 2.12). In Tarai region non-availability of modern technologies was ranked as III with the weighted score of 2.13 followed by lack of transportation facilities (rank IV and weighted score 2.11) and lack of specified skills (rank V and weighted score 1.72).

CONCLUSION

Economic core ranked as main motive among the four cores namely economic, individual work and social core. Majority of women entrepreneurs were working to supplement family income and also to save for education and marriage of children. Self motivation was found to be the main source of motivation. Husbands were found as main source of moral, economical and technical support. Lack of knowledge about agencies / institutions

Table 3: Constraints profile of women entrepreneur engaged in dairying

S. No.	Types of constraints	Hill region n= 120			Tarai region n= 120		
		Yes	No	N/A	Yes	No	N/A
				Weighted mean	Rank	Weighted mean	Rank
I. Socio – personal constraints							
1.	Unfavorable attitude of the family members	14	97	9	2.04	23	8
2.	Lack of technical know how	28	80	12	2.13	33	46
3.	Excessive burden of work and responsibilities	104	10	6	2.82	18	26
4.	Lack of knowledge about agencies/institute working for women entrepreneurs	120	00	00	3.00	00	00
5.	Lack of confidence in yourself	82	21	17	2.54	32	20
6.	Lack of leisure activities in your routine	6	41	73	1.44	39	74
7.	Excessive tension because of burden of enterprise	54	38	28	2.22	47	31
8.	Unable to handle managerial abilities	25	31	64	1.66	21	54
9.	Afraid to take risk	88	22	10	2.65	21	36
II. Financial and resource constraints							
10.	Lack of information about government schemes for women entrepreneurs	120	00	00	3.00	00	00
11.	Lack of knowledge about good breeds of milch animals	82	21	17	2.54	32	9
12.	Lack of knowledge regarding machinery and equipment to be used in dairying	120	00	000	3.00	00	0
13.	Lack of proper marketing facilities	68	31	31	2.39	26	42
14.	Lack of knowledge regarding type as of market available	39	22	59	1.83	32	60
III Socio – psychological constraints							
15.	Lack of self motivation	35	72	13	2.18	83	11
16.	Lack of motivation from family and society	36	49	35	2.00	47	39
17.	Face conflicts due to responsibilities	68	34	18	2.41	35	18
18.	Non- cooperative attitude of husband and family members	19	81	20	1.99	82	16
19.	Lack of appreciation from family members	21	31	68	1.60	33	52
20.	Lack of recognition in the family	32	11	77	1.62	31	79
21.	Work is not accepted because of not being as for norms of the society	23	15	82	1.50	30	71
22.	Face male dominance	53	41	26	2.23	59	29
23.	Lack of social contacts	81	21	18	2.52	74	15
24.	Lack of confidence in women's ability	00	120	00	2.00	00	00
IV Technical constraints							
25.	Lack of technical know how	120	00	00	3.00	00	00
26.	Lack of specified skills	53	31	36	2.14	31	64
27.	Non availability of modern technique	62	28	40	2.35	58	21
28.	Lack of transportation	61	12	47	2.12	54	39
29.	Lack of technical aspects of dairying	103	00	17	12.72	79	00

working for women entrepreneurs was reported to be the major constraint followed by lack of confidence. Lack of information about government schemes for women entrepreneurs and lack of knowledge regarding machinery and equipment to be used in dairying were the major financial and resources constraints. Lack of social contacts, face conflicts due to responsibilities, mail

dominance and lack of motivation were the main socio-psychological constraints. Lack of technical know – how followed by lack of technical aspects of dairying and no availability of modern technologies were the major technical constraints.

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Predicting Socialization of Enterprise Guava from a Score of Agro-economic and Socio-personal Factors

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ABSTRACTS

The study has been conducted to find out socialization with respect to guava. A total of 200 farmers were selected from two villages of Nadia district of West Bengal, 100 farmers from each of the villages. It has been found that variables per capita expenditure on education and savings/person/year have contributed substantial percentile, which account for 23.54 per cent and 18.76 per cent respectively on socialization of enterprise (guava). And it has also been found after doing the step down multiple regression of data revealed that the variables viz. per capita expenditure on education, per capita expenditure on agriculture, knowledge about fungicides and attitude towards rejection have been retained after eliminating the trivial variables in the preceding steps. So, these variables together have explained 16.52 per cent of the total R^2 values of 24.72 per cent i.e. the recombination of these variables have explained almost 66.82 per cent of the total explicable variance.

Keywords: Socialization, Adoption, Non-adoption, Education, Guava

INTRODUCTION

An understanding of social issues is very much needed as we know that the West Bengal is an agrarian state with the rural population of more than 72%. The economy of West Bengal is well diversified and agriculture in West Bengal contributes 24% of State GDP and around 70 percent of the population is dependent upon agriculture directly or indirectly. West Bengal is the fourth largest producer of guava and accounts for 7.5 % of total production of guava in the country (JIT Report of West Bengal, 2010). On the basis of social nature of farming the social basis of adoption, rejection and discontinuance are needed if agricultural extension is to be effective in addressing natural resource management, and in promoting sustainability in its triple bottom line conceptualizing. As a socio-cultural practice, agriculture it is governed, informed and regulated by social processes. Being aware of this fact, and reflectively thinking about what this understanding means will assist in the promotion of a sustainable agriculture for Indian's future. Farmers can be categorized on every single variable that can be logically considered in conjunction with agriculture. Instead of classifying farmers according to demographic of structural variables as has been undertaken by extension researchers in the past (e.g. adopter vs. non-

adopter; innovator vs. laggard; big vs. small; old vs. young; valley floor vs. hillside), it may be more meaningful to group farmers according to sub cultural groupings representing, a conglomerate of social and structural variables. These can be called styles of farming (Vanclay *et al.*1998; Howden *et al.*1998).

Adoption takes place in a social context, with farmers discussing their ideas with other farmers. Much adoption occurs when the idea or practice to be adopted has become part of the normative concept of 'good farm management' (Phillips and Gray, 1995; Vanclay and Lawrence, 1995). Good farm management is a social concept and farmers determine what constitutes good farm management through interaction with other farmers, with extension officers (public and private), through reading farming literature and through exposure to other media. It also held that all new ideas, if successfully extended, would be adopted. Where non-adoption occurs, obviously a real commitment to innovation does not exist and non-adoption is sensible strategy. There are lots of reasons why farmers may not have real commitment to new technologies, and thus, non-adoption rational from the perspective of the farmer. Therefore, the socialization process always gives freedom to the farming community to decide on adoption, non-adoption, rejection and discontinuance.

MATERIALS AND METHODS

The discussion on the methodology has been made to understand the concepts, methods and techniques, which are utilized to design the study, collect the information, analyze the data and interpret the findings for revelation of truth and formulation of theories. It deals with the research methodology, had been adopted for the purpose of the present study.

The present study was conducted at Chakdah Block of Nadia District (W.B). The districts, block and villages were selected purposively due to the following reasons:

- The characters and the factor under study have been well discernible in this area
- The researcher's close familiarity with respect to area, people officials and local dialects;
- The ample opportunity to generate relevant data due to the close proximity of the area with the research and extension wing of the State Agricultural;
- The highly cooperative, responsive respondents;
- The profuse scope to get relevant information regarding adoption-rejection and discontinuance of agricultural technology;
- Experienced, well versed, venturesome and risk bearing farm entrepreneurs;
- Easy accessibility of the area;
- The study would help the researcher to conduct diversified extension programmes and activities in future.

Multistage random sampling procedure techniques were adopted for the present study. It may be termed as multistage random sampling procedure. The districts, blocks and villages were purposively selected for the study. The districts Nadia and the blocks Chakdah were considered. Under the Chakdah block Madanpur and Ghoragachha villages was selected. An exhaustive list of respondents was prepared with the help of block officials for villages. From the prepared list to hundred respondents were selected randomly from each village for the final data collection.

RESULT AND DISCUSSION

Data in Table 1 presents the correlation coefficient of socialization of enterprise (guava) with 46 independent variables. It has been found that the variables viz. family educational status (X_3), per capita expenditure on

clothes (X_{13}), innovation proneness (X_{27}), market orientation (X_{32}), knowledge about fungicides (X_{36}), knowledge about weed control (X_{37}), attitude towards adoption (X_{41}), attitude towards discontinuance (X_{42}) and attitude towards rejection (X_{43}) have recorded the positive and significant correlation with socialization of enterprise (guava), and the following variables viz. expenditure incurred on fungicide (X_8), expenditure incurred on seeds (X_{11}), savings/person/year (X_{19}) and loan/person/year (X_{20}) have recorded the significant but negative correlation with socialization of enterprise (guava).

Family educational status (X_3): The variable, family educational status (X_3) has done well with socialization of enterprise (guava), it gives the perception that villages Ghoragachha and Madanpur are undergoing modernization process in agril-horti enterprises very fast. The socialization of improved variety of guava plants are happening at faster rate and also with the improved system of training and pruning. As we know that for doing better cultivation, the collective education status of the family is very much needed. Family education status provides risk bearing capability or readiness to get socialized with guava enterprise.

Per capita expenditure on clothes (X_{13}): Expenditure on clothes in rural families have shown positive correlation with the socialization of enterprise (guava), it has also shown the proportionate relation too. It indicates tendency of the individual to cope up with socialization process in guava enterprise.

Innovation proneness (X_{27}) and Market Orientation (X_{32}): The variables viz. Innovation proneness (X_{27}) and Market Orientation (X_{32}) have also shown their positive correlation with socialization of enterprise (guava) and these independent variables are the prime mover in socialization process. Innovation proneness shows the way for accepting or adopting the technology which can give optimum return and also paves the way for socialization of guava enterprise. The variable market orientation (X_{32}) has also positively contributed to the socialization of guava enterprise. It also gives a good indication that there is huge potential of market to accommodate the production of new or improved variety of guava.

Knowledge about Fungicides (X_{36}) and Knowledge about weed control (X_{37}): Knowledge about fungicide (X_{36}) and knowledge about weed control (X_{37}) have become indicator practice that help us to assess,

Table 1: Correlation coefficient of socialization of enterprise (guava) with 46 independent variables

Variables	r-value
Age (X_1)	0.027
Education (X_2)	-0.010
Family educational status (X_3)	0.136*
Family size (X_4)	0.107
Educational aspiration (X_5)	0.100
Expenditure incurred on hiring machine (Tractor, power tiller, disc harrow, X_6)	-0.087
Expenditure incurred on fertilizer (X_7)	-0.017
Expenditure incurred on fungicide (X_8)	-0.204**
Expenditure incurred on insecticide (X_9)	0.043
Expenditure incurred on herbicides (X_{10})	-0.101
Expenditure incurred on seeds (X_{11})	-0.204**
Per capita expenditure on food (X_{12})	0.063
Per capita expenditure on clothes (X_{13})	0.154*
Per capita expenditure on health (X_{14})	0.076
Per capita expenditure on education (X_{15})	0.122
Per capita expenditure on recreation (X_{16})	-0.059
Per capita expenditure on agriculture (X_{17})	0.095
Per capita expenditure on animal husbandry production (X_{18})	0.075
Savings/person/year (X_{19})	-0.280**
Loan/person/year (X_{20})	-0.308**
Cropping intensity (X_{21})	-0.043
Farm size (in Bigha) and technology adoption (X_{22})	0.118
Annual income (Rs./year/capita) (X_{23})	-0.063
Adoption leadership (X_{24})	0.118
Scientific Orientation (X_{25})	0.106
Independency (X_{26})	0.036
Innovation proneness (X_{27})	0.152*
Risk orientation (X_{28})	-0.094
Economic motivation (X_{29})	0.040
Management orientation (X_{30})	0.078
Production orientation (X_{31})	0.115*
Market orientation (X_{32})	0.171
Orientation towards competition (X_{33})	-0.046
Farmer's Orientation towards development of skill in farm workers (X_{34})	0.009
Knowledge about plant protection (X_{35})	0.118
Knowledge about Fungicides (X_{36})	0.145*
Knowledge about weed control (X_{37})	0.155*
Knowledge about rodent control (X_{38})	0.016
Farmer's knowledge about IPM practices (X_{39})	0.013
Farmers attitude towards IPM programme (X_{40})	0.093
Attitude towards Adoption (X_{41})	0.199**
Attitude towards discontinuance (X_{42})	0.159*
Attitude towards rejection (X_{43})	0.219**
Social participation (X_{44})	-0.054
Utilization of cosmopolite sources of information (Mass media, Personal cosmopolite, Personal Localite, X_{45})	0.089
Training received (X_{46})	0.024

*Significant at 0.01 level; **Significant at 0.05 level

estimate, and project the level and direction of socialization of guava enterprise. The farmers in this area have started controlling both fungi and weed through application of fungicide and weedicide or herbicide and these have contributed positively to the guava yield, and in general we can say that the socialization of guava enterprise are proceeding in right direction with the help of knowledge about fungicide and knowledge about weed control.

Attitude towards Adoption (X_{41}), Attitude towards discontinuance (X_{42}) and Attitude towards rejection (X_{43}): Adoption provides an opportunity to realize an innovation to happen. An adoption of any new idea or new innovation leads to complete socialization and here, it has shown for the socialization of enterprise (Guava). Discontinuance and rejection are the critical factor that can pave the way for ongoing socialization from present to posterity. The farmers discontinue a practice, because he wants to continue the better one afresh, and in same way, reject because he is ready to accept a better alternative too.

Expenditure incurred on fungicide (X_8): The variable expenditure incurred on fungicide (X_8) has recorded significant but negative impact on the socialization of enterprise (Guava). This implies that decision on spending for fungicide generated from the knowledge about fungicide, which has shown the right way. Since the area has already undergone a comprehensive socialization process, the expenditure on fungicide been failed to record anything empathetic on socialization of enterprise (guava).

Expenditure incurred on seeds (X_{11}): Expenditure of seeds has been so common and integral to the socialization process itself that it has failed to generate any positive impact on socialization process.

Savings/person/year (X_{19}) and Loan/person/year (X_{20}): Loan and saving have both been reciprocally impacting on socialization of enterprise (guava) the reason might be that guava growers in these areas, by default, have been 'elite' category of farmers, having enough to defray the cost of investment but not enough to save from the enterprise. This is because more of investment after agriculture does not assure one to be awarded with plenty of rewards either.

Data in Table 2 presents the multiple regression analysis which reflects the functional efficacy of the correlation through 'beta' value and respective 't' values

of the causal variables on the consequent variable i.e. socialization of enterprise (guava). It has been found that variables viz. education (X_2), expenditure incurred on fungicide (X_8), per capita expenditure on education (X_{15}) and attitude towards rejection (X_{43}) have recorded the positive functional impact on the socialization of enterprise (guava). It has also been found that the causal variables viz. per capita expenditure on education (X_{15}) and savings/person/year (X_{19}) have contributed substantial percentile contributions on socialization of enterprise (guava). The R^2 value being 0.2472, it is to conclude that the combination of all 21 variables has so far been able to explain 24.72 per cent of variability embedded with the consequent variable.

Data om Table 3 presents the step down multiple regression. It has been found that the variables, per capita expenditure on education (X_{15}), per capita expenditure on agriculture (X_{17}), knowledge about fungicides (X_{36}) and attitude towards rejection (X_{43}) have been retained after eliminating the trivial variables in the preceding steps. So, these variables together have explained 16.52 per cent of the total R^2 values of 24.72 per cent i.e. the recombination of these causal variables

have explained almost 66.82 per cent of the total explicable variance. So, these four variables of the total 21 variables merit highest importance in the socialization of enterprise (guava).

Data in Table 4 presents the path analysis, by decomposing the total effect (r) of antecedent variables into direct effect, indirect effect and residual effect. Path analysis has been administered to get the direction and network of influence of antecedent variables on consequent variable. Table depicts that variable, per capita expenditure on education (X_{15}) has exerted highest direct effect on socialization of enterprise (guava), followed by the variables, education (X_2) and saving/person/year (X_{19}). Guava cultivation being a long duration crop enterprise, it requires better techniques and skills which can be obtained through the process of acquiring better education that can exert better adoption capability. In case of indirect effect education (X_2) has exerted highest indirect effect on the consequent variable, Socialization of enterprise (guava), followed by variables, expenditure incurred on fertilizer (X_7) and attitude towards discontinuance (X_{42}). Being a socio-personal variable education has also been

Table 2: Multiple regression analysis of socialization of enterprise (guava) with 21 causal variables

Variables	Beta	Beta x R	Reg. Coef-B	SE of B	T-Val of B
Age (X_1)	-0.054	-0.595	-1.276	1.910	0.668
Education (X_2)	-0.188	0.742	-25.923	11.941	2.171 *
Family size (X_4)	0.074	3.193	8.434	8.758	0.963
Expenditure incurred on fertilizer (X_7)	0.134	-0.911	6.048	3.264	1.853
Expenditure incurred on fungicide (X_8)	-0.143	11.835	-21.602	10.944	1.974 *
Per capita expenditure on food (X_{12})	-0.070	-1.777	-3.030	3.376	0.897
Per capita expenditure on education (X_{15})	0.204	23.539	18.049	7.654	2.358*
Per capita expenditure on agriculture (X_{17})	0.110	7.521	5.042	3.555	1.418
Savings/person/year (X_{19})	-0.166	18.757	-5.051	2.837	1.780
Cropping intensity (X_{21})	0.079	1.455	0.272	0.249	1.094
Farm size (in Bigha) and technology adoption (X_{22})	0.061	2.939	4.071	5.393	0.755
Annual income (Rs./year/capita) (X_{23})	-0.017	0.430	-0.456	2.152	0.212
Innovation proneness (X_{27})	0.054	3.313	14.659	21.382	0.686
Economic Motivation (X_{29})	-0.032	-0.511	-8.758	20.379	0.430
Management Orientation (X_{30})	0.056	1.753	14.353	19.329	0.743
Market Orientation (X_{32})	0.097	6.714	25.112	19.620	1.280
Knowledge about Fungicides (X_{36})	0.113	6.620	136.229	81.748	1.666
Attitude towards discontinuance (X_{42})	0.019	1.221	6.011	24.917	0.241
Attitude towards rejection (X_{43})	0.158	14.004	48.052	23.259	2.066*
Utilization of cosmopolite sources of information (Mass media, Personal cosmopolite, Personal Localite, X_{45})	-0.015	-0.553	-7.721	34.925	0.221
Training received(X_{46})	0.032	0.310	3.018	6.622	0.456

Multiple R^2 = 0.2472, Multiple R = 0.4972, F-Value for R = 2.78 with 21 and 178 Dfs

*Significant at 0.05 level of significance; **Significant at 0.01 level of significance

Table 3: Step down multiple regression analysis of socialization of enterprise (guava) with 21 causal variables

Variables	Beta	Beta x R	Reg. Coef.-B	SE of B	T-Val of B
Per capita expenditure on education (X_{15})	0.259	44.658	22.883	5.840	3.918 **
Per capita expenditure on agriculture (X_{17})	0.185	18.882	8.459	2.993	2.826 **
3. Knowledge about Fungicides (X_{36})	0.134	11.829	162.663	79.336	2.050 *
Attitude towards rejection (X_{43})	0.186	24.631	56.480	20.048	2.817 **

Multiple $R_2 = 0.1652$ Multiple $R = 0.4065$ F-Value for $R = 9.65$ with 4 and 195 Dfs

*Significant at 0.05 level of significance; ** Significant at 0.01 level of significance

Table 4 : Path analysis of socialization of enterprise (guava) with 21 antecedent variables

Variables	Total effect	Direct effect	Indirect effect	Substantial effect		
				I	II	III
Age (X_1)	0.0273	-0.0538	0.0811	0.0952 (X_2)	-0.0320 (X_{15})	0.0232 (X_{17})
Education (X_2)	-0.0098	-0.1876 (II)	0.1778 (I)	0.0771 (X_{15})	0.0273 (X_1)	0.0165 (X_{32})
Family size (X_4)	0.1068	0.0739	0.0329	0.0200 (X_{22})	0.0196 (X_2)	0.0172 (X_{19})
Expenditure incurred on fertilizer (X_7)	-0.0168	0.1343	-0.1511 (II)	-0.0378 (X_{15})	-0.0318 (X_{19})	-0.0248 (X_{32})
Expenditure incurred on fungicide (X_8)	-0.2043	-0.1432	-0.0611	-0.0485 (X_{15})	-0.0280 (X_{43})	-0.0199 (X_{19})
Per capita expenditure on food (X_{12})	0.0625	-0.0702	0.1327	0.0627 (X_{19})	0.0245 (X_{43})	0.0233 (X_8)
Per capita expenditure on education (X_{15})	0.2846	0.2045 (I)	0.0801	-0.0708 (X_2)	0.0688 (X_{19})	0.0340 (X_8)
Per capita expenditure on agriculture (X_{17})	0.1685	0.1103	0.0582	0.0522 (X_{19})	0.0137 (X_2)	-0.0113 (X_1)
Savings/person/year (X_{19})	-0.2798	-0.1657 (III)	-0.1141	-0.0849 (X_{15})	-0.0348 (X_{17})	0.0266 (X_{12})
Cropping intensity (X_{21})	0.0458	0.0786	-0.0328	-0.0289 (X_{19})	-0.0246 (X_2)	0.0184 (X_{32})
Farm size (in bigha) and technology adoption (X_{22})	0.1182	0.0615	0.0567	0.0309 (X_{15})	-0.0304 (X_2)	0.0240 (X_4)
Annual income (Rs./year/capita) (X_{23})	-0.0631	-0.0168	-0.0463	-0.0513 (X_2)	-0.0220 (X_{19})	0.0195 (X_{22})
Innovation proneness (X_{27})	0.1521	0.0539	0.0982	0.0514 (X_{43})	0.0387 (X_{15})	-0.0379 (X_2)
Economic Motivation (X_{29})	0.0399	-0.0316	0.0715	0.0289 (X_{43})	-0.0269 (X_2)	0.0184 (X_{30})
Management Orientation (X_{30})	0.0780	0.0555	0.0215	0.0307 (X_{15})	0.0253 (X_{43})	-0.0239 (X_2)
Market Orientation (X_{32})	0.1709	0.0971	0.0738	0.0432 (X_{15})	-0.0343 (X_7)	-0.0318 (X_2)
Knowledge about Fungicides (X_{36})	0.1454	0.1126	0.0328	0.0114 (X_{15})	-0.0110 (X_2)	0.0087 (X_{21})
Attitude towards discontinuance (X_{42})	0.1594	0.0189	0.1405 (III)	0.0661 (X_{43})	0.0254 (X_{32})	-0.0223 (X_2)
Attitude towards rejection (X_{43})	0.2188	0.1582	0.0606	0.0272 (X_{15})	0.0254 (X_8)	0.0249 (X_{19})
Utilization of cosmopolite sources of information (Mass media, Personal cosmopolite, Personal Localite, X_{45})	0.0887	-0.0154	0.1041	0.0220 (X_{43})	0.0216 (X_{15})	-0.0213 (X_2)
Training received (X_{46})	0.0237	0.0324	-0.0087	0.0216 (X_{15})	-0.0208 (X_2)	-0.0152 (X_8)

Residual Effect= 0.7528

rendered enough capability for influencing indirectly the performance of other variables.

It is discernible from the table that the highest number of variables (14 times) has routed their substantial indirect effect through the variable, education (X_2). Therefore it could be inferred that variable education (X_2) has got both substantive and associational properties to characterize the socialization of enterprise (guava). The residual effect being 0.7528, it is to conclude that 75.28 per cent of variation in this relation could not be explained.

CONCLUSION

It was found that variable per capita expenditure on education has exerted highest direct effect on socialization of enterprise (guava), which is true in real sense, because for a proper decision making to happen a farmer needs to spend more amounts on education for his family. The variables viz. Per capita expenditure on education, Attitude towards rejection, Per capita expenditure on agriculture and Knowledge about fungicides have contributed 44.65 per cent, 24.63 per cent, 18.88 per cent and 11.83 per cent of their efficiency respectively to socialization of enterprise

guava and these also provided suitable atmosphere for adoption, non-adoption, discontinuance and rejection.

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Comparison of Overall Knowledge about Improved Agricultural Practices of Wheat Production Technology of Beneficiaries and Non Beneficiaries' Farmers at KVK Operational Area Banswara and Dungarpur Districts of South Rajasthan

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ABSTRACT

The Krishi Vigyan Kendra, Banswara and Dungarpur of southern Rajasthan are engaged in providing skill oriented vocational trainings to the farmers, farm women and rural youth since 1983 and 1992 respectively in their operational areas. The present study was planned to see the effectiveness of training programmes organized by KVKs on wheat crop for tribal farmers of southern Rajasthan. For this purpose, 120 beneficiary tribal farmers and 120 non beneficiary tribal farmers were selected for the present study from the two tribal population dominated district namely Banswara and Dungarpur. Findings of the study showed the significant difference between beneficiary tribal farmers and non- beneficiary tribal farmers regarding their level of over all knowledge about improved cultivation practices of wheat production technology. It shows the effectiveness of the training programmes organized by KVKs.

Keywords: Krishi Vigyan Kendra, Training programmes, Wheat, Tribal farmers and knowledge

INTRODUCTION

Agriculture being dominant sector of India is backbone of its economy and would continue to be the most predominant sector in future also. Agriculture contributes nearly 30% of Net Domestic Product (NDP) and employs 70% of the people. The agriculture extension system in India faces a tough challenge in meeting the agricultural production and productivity requirements of the farmers. The basic problem of this is not so much of poverty of natural resources but under development of human resource. Now a days when research in agriculture is moving fast and practically, every month new practices of modern cultivation are coming to light, it is essential that the farmers are kept abreast of the dynamic agriculture by an equally dynamic system of extension. It is commonly realized that very little attention has so far been paid towards non-formal education in rural areas especially in tribal areas. Due to this, transfer of newly generated proven technology is taking place at a slow pace. Considering these facts, ICAR has already been planned to increase Krishi Vigyan Kendra in the country. Since

Krishi Vigyan Kendra (KVKs) are engaged in promoting science and technology in agriculture in this area for more than decade through providing trainings to farmers on scientific cultivation practices of major crops of the area, it is important to see its impact over the area. Wheat being the major crop of this area, knowledge level regarding improved cultivation practices of wheat production technology will give sufficient evidence of success achieved by KVKs.

MATERIALS AND METHODS

This study dealt with the gain in knowledge among tribal farmers through training programmes organized by Krishi Vigyan Kendra (KVKs). Present study was carried out in tribal dominated areas of Banswara and Dungarpur districts of southern Rajasthan. For this purpose four panchayat samities were selected from two districts i.e. two panchayat samities from each district on the basis of maximum training programmes organized by KVKs. Two villages from each panchayat samiti were selected from where maximum farmers participated in training programme organized by KVKs.

Thus the total numbers of selected villages were eight. For selection of respondents, a list of beneficiaries was prepared who had participated in any of the training programme related to improved agricultural practices of wheat production technology organized by KVKs. Out of this list, 15 respondents were randomly selected from each village as respondents for present study. Similarly 15 non-beneficiaries were selected from each village as control group for comparison. Thus in all 30 respondents from each village were randomly selected. So the sample size for the present study from eight villages was 120 beneficiaries and 120 non-beneficiaries. Thus the sample of the study was consisted of 240 farmers. The personal interview technique was used to collect the data for the present investigation. The tool used for data collection was a structured interview schedule. Interview schedule had thirteen practices with a total number of 76 items questions. Each question carries one mark for the each correct answer and zero for incorrect answer.

RESULT DISCUSSION

Age: The data in Table 1 indicated that the majority of beneficiary farmers (56.6%) were found to be in middle age group, whereas 27.5 per cent beneficiary respondents were found in young age group. Only 15.83 per cent beneficiary respondents were found in old age group.

Similarly in case of non beneficiary respondents, 69 respondents (57.5%) were belonged to middle age group, whereas only 25 per cent were in young group only. While majority of combined respondents (57.08%) were found to be in middle age group followed by young age group (26.50%) and old age group (16.67%) respectively. Hence it may be concluded that majority of beneficiary and non beneficiary respondents were in middle age group followed by young and old age group respectively.

Education: The data presented in the Table 1 reveals that 62.5 per cent beneficiary and 70.83 per cent non beneficiary respondents were illiterate whereas only 27.5 per cent beneficiary and 23.33 per cent non beneficiary respondents were found to be literate. Only 10 per cent beneficiary and 5.83 per cent non beneficiary respondents were found to be educated. Table also reveals that majority of combined respondents were found to be illiterate (66.67%), followed by literate (25.42%) and educated (7.9%) respectively.

Occupation: The data presented in the Table 1 reveals that 79.16 per cent beneficiary respondents were engaged in agriculture, whereas in case of non beneficiary respondents it was 85 per cent. Only 20.83 per cent beneficiary and 15 per cent non beneficiary respondents were engaged in agricultural business. Table also reveals that majority of combined respondents (82.08%) were found agriculture as an occupation followed by other business (17.92%).

Participation: Observation of the Table 1 reveals that 60.83 per cent beneficiary respondents and 80 per cent of non beneficiary respondents were found to be as passive participants. Whereas, only 39.16 per cent beneficiary had active participation. While in case of non beneficiary respondents, only 20 per cent were found to be active participants. In case of combined respondents, majority (70.42%) were found passive participants. Only 29.58 per cent respondents were found as active participants.

Size of Land Holding: The data presented in the table 1 clearly shows that majority of beneficiary farmers (54.16%) were to be found in the category of small farmers followed by big farmers (40%) and 5.83 per cent marginal farmers respectively. Whereas in case of non beneficiary respondent farmers, 56.60 per cent were found as small farmers followed by 26.67 per cent big farmers and 16.67 per cent marginal farmers respectively. Table reveals that majority of combined respondents (55.42%) were small farmers followed by big (33.33%) and marginal farmers (11.25%) respectively.

Type of Family: The data presented in the Table 1 reveals that 35.83 per cent beneficiary and 39.16 per cent non beneficiary respondents had nuclear family whereas 64.16 per cent beneficiary and 60.83 per cent non beneficiary respondents had joint family. In case of combined respondents, majority of respondents (62.5%) had joint family followed by nuclear family (37.5%), respectively.

It was observed (Table 2) that majority (66.67%) of the beneficiary tribal respondents were having medium level of knowledge about improved agricultural practices of wheat production technology followed by 17.50 per cent had high and 15.83 per cent had low level of knowledge. Similarly in case of the non beneficiary tribal respondents, 77 per cent had low to medium knowledge followed by low level (20%) and high level of knowledge (15.83%) respectively.

Data shows in the Table 3 reveals that beneficiaries of the training programme conducted by the KVKs had fairly good knowledge about recommended spacing (83.75%), balance use of fertilizer (83.47%), time and method of sowing (77.11%), seed rate and depth of sowing (75.60%), soil treatment (74.50%), use of high yielding varieties (74.05%) and irrigation management (72.74%). Beneficiary respondents had medium knowledge with regards to harvesting and storage (67.70%), plant protection measures (67.17%) and use of inter cropping (66.88%). Beneficiary respondents had least knowledge regarding seed treatment (63.50%) and use of culture (63.45%) respectively.

While in case of non beneficiary respondents, they

had medium level of knowledge regarding practice of recommended spacing (56.15%), soil treatment (56%) and seed rate, depth of sowing (53.50%) and harvesting and storage (53.50%) respectively. Table 2 Further shows that non beneficiary respondents had low level of knowledge about balance use of fertilizer (42.75%), plant protection measures (42.61%), use of inter cropping (39.75%), use of HYV seed of wheat crop, time and method of sowing (39.40%) and plant protection measures (33.17%). They possessed least knowledge level regarding use of culture (32.70%), seed treatment (31.20%) and chemical weed control (30.21%) respectively. The low level of knowledge of non beneficiaries with regards to use of culture, seed

Table 1: Distribution of the respondents on the basis of their personal characteristics

Personal Characteristics	Beneficiaries respondents		Non-Beneficiaries respondents		Combined	
	Frequency	%	Frequency	%	Frequency	%
Age						
(i) Young	33	27.5	30	25	63	26.58
(ii) Middle	68	56.6	69	57.5	137	57.08
(iii) Old	19	15.83	21	17.5	40	16.67
Education						
(i) Illiterate	75	62.5	85	70.83	160	66.67
(ii) Literate	33	27.5	28	23.33	61	25.42
(iii) Other	12	10.0	7	5.80	19	7.92
Occupation						
(i) Agriculture	95	79.16	102	85	189	82.08
(ii) Other	25	20.83	18	15	43	17.92
Participation						
(i) Active	47	39.16	24	20	71	29.58
(ii) Pasive	73	60.83	96	80	169	70.42
Size of Land Holding						
(i) Big Farmer	48	40.00	32	26.67	80	33.33
(ii) Small	65	54.16	68	56.60	133	55.42
(iii) Marginal	7	5.83	20	16.67	27	11.25
Type of Family						
Nuclear Family	43	43	47	39.16	90	37.5
Joint Family	77	77	73	60.83	150	62.5

Table 2: Distribution of respondents according to their extent of knowledge about improved agricultural practices of wheat production technology

Extent of knowledge about wheat production technology	Beneficiary	Extent of knowledge about wheat production technology	Non-Beneficiary
Low (below 45.74 score)	19(15.83)	Low (below 20.92 score)	24(20)
Medium(45.74 to 63.51 score)	80(66.67)	Medium(20.92 to 39.08 score)	77(64.16)
High (above 63.51 score)	21(17.50)	High (above 39.08 score)	19(15.83)
Total	120(100)		120(100)

Table 3: Present status of knowledge of beneficiary and non beneficiary respondents with regards to improved agricultural practices of wheat production technology

Name of practices	Present status of knowledge			
	Per cent beneficiaries	Rank	Per cent non-beneficiaries	Rank
Use of HYV seed of wheat	74.05	VI	39.50	VIII
Use of inter cropping	66.88	X	39.75	VII
Soil treatment	74.50	V	56.00	II
Seed treatment	63.50	XII	31.20	XII
Use of culture	63.45	XIII	32.70	XI
Time & methods of sowing	77.11	III	39.40	IX
Recommended spacing	83.75	I	56.15	I
Seed rate & depth of sowing	75.60	IV	53.60	III
Balanced use of fertilizer	83.47	II	42.75	V
Chemical weed control	66.58	XI	30.21	XIII
Irrigation management	72.74	VII	42.61	VI
Plant protection measures	67.17	IX	33.17	X
Harvesting & storage	67.70	VIII	53.50	IV

Table 4: Comparison of knowledge between beneficiary and non- beneficiary with regards to improved agricultural practices of wheat production technology

Name of practices	Mean score obtained		Difference	'Z' Test
	Beneficiaries	Non-beneficiaries		
Use of HYV seed of wheat	11.108	5.925	5.183	21.40**
Use of inter cropping	2.67	1.59	1.08	11.6**
Soil treatment	1.49	1.12	0.37	4.87**
Seed treatment	2.54	1.248	1.292	13.01**
Use of culture	2.538	1.308	1.23	12.61**
Time & methods of sowing	5.398	2.758	2.64	19.86**
Recommended spacing	1.675	1.123	0.552	8.16**
Seed rate & depth of sowing	2.358	1.608	0.75	9.199**
Balanced use of fertilizer	5.008	2.565	2.443	22.87**
Chemical weed control	7.99	3.625	4.365	21.547**
Irrigation management	5.09	2.983	2.107	17.063**
Plant protection measures	4.03	1.99	2.04	17.44**
Harvesting & storage	2.708	2.14	0.568	8.432**

** Significant at 1 % level of significance

Table 5: Comparison of beneficiaries and non beneficiaries with regards to their overall present status of knowledge about improved agricultural practices of wheat production technology

Crop	Mean score obtained by beneficiary respondents	Mean score obtained by non-beneficiary respondents	Difference	'Z' Test
Wheat	54.62	30.00	24.625	21.237**

treatment and chemical weed control might be due to lack of technical know how and technical advise, as it is required more practice due to its complexity of its use. The findings are in line with the findings of

Mahawer (1998) who reported that majority of respondents had low knowledge about seed treatment practice. As data in the Table 4 reveals that there was a significant difference in knowledge between beneficiary

and non beneficiary respondents in all the 13 improved agricultural practices of wheat production technology namely use of HYV seed of wheat, use of inter cropping, soil treatment, seed treatment, use of culture, time & methods of sowing, recommended spacing, seed rate & depth of sowing, balanced use of fertilizer, chemical weed control, irrigation management, plant protection measures and harvesting & storage. The calculated 'Z' value also found to be significant in each practice. Therefore null hypothesis was rejected and alternative hypothesis was accepted. Thus it was concluded that that farmers who benefited by training programmes organized by the KVK had more knowledge about different improved agricultural practices of wheat production technology as compare to non beneficiary farmers. These findings are in confirmation with by the findings of Mahawer (1998) and Chand (1993).

It is quite evident in the Table 5 that the beneficiary respondents had significantly higher knowledge than non-beneficiary respondents regarding improved agricultural practices of wheat production technology. This may be due to timely and adequate support, technical advise and better transfer of technology through training programmes organized by the KVK Banswara and KVK Dungarpur. Thus it may be concluded that training programmes organized by the KVKs had played role in increasing the level of knowledge of the beneficiary respondents regarding improved agricultural practices of wheat production technology. The findings are supported by Trivedi and Patel (1990), who reported a significant difference between trained and untrained farmers with respect to their knowledge level regarding improved practices of wheat crop.

CONCLUSION

The study revealed that majority of beneficiaries and non beneficiaries tribal respondents were found in middle age group followed by young and old age group respectively. The majority of respondents of both the category were illiterate, found to be agriculture as their occupation, had passive participation, they possessed small land holdings and had joint family. Majority of beneficiary (66.67%) and non beneficiary (64.16%) were found to have medium level of knowledge with regards to improved practices of wheat crop. It was found that on an average score obtained with regards to improved agricultural practices of wheat production technology by beneficiaries and non beneficiaries' respondents were 71.875 per cent 39.47 per cent respectively. The highly significant difference was observed between beneficiary and non beneficiary respondents regarding their extent of knowledge about wheat production technology.

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Socio-economic Determinants of Women Leaders in PRIs: A Study in Uttarakhand

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ABSTRACT

The 73rd Constitutional Amendment Act has brought many women leaders into the Panchayati Raj Institutions. These women represent diverse background- rich and poor, oppressed and backward, educated/ literate and illiterate, young and old, working women and home makers etc. An unprecedented number of women occupying leadership positions in local bodies and participating actively in the local political process is a reality now because of this new innovative effort. This study was conducted in three districts of Uttarakhand State i.e. Udham Singh Nagar, Dehradun and Tehri Garhwal districts on two hundred women leaders especially Pradhans who were selected through census method. Data were collected with the help of semi structured interview schedule. The study aims at finding the socio-economic status of the women leaders under PRIs. The major findings of the study indicated that women leadership at the grass root level was dominated by educated, middle aged and of reserved categories women with medium economic status.

Keywords: Women leaders, PRIs and 73rd Constitutional Amendment

INTRODUCTION

India has experienced marked changes both at national or international level. Technological advancements, penetration of ICT in both urban and rural sector, changes in recent government development policies has resulted in change of social structure and power relations in country as a whole. Government initiated various programmes like ICDS, DWCRA, TRYSEM, SGSY etc. to ameliorate the condition of rural women. In spite of 'rapid pace of development with government initiative to uplift the marginalized and weaker section of the society, still a part of population are suppressed and are unable to be the part of mainstream. This fact relates to especially women in rural areas. Even globally, the Millennium Development Goals framework focused on promoting gender equality and women empowerment. To bring rural women at par with male counterparts multi-pronged strategies are initiated.

The status of women in India has been subjected to many great changes over the past few millennia. From equal status with men in ancient times through the low points of the medieval period to the promotion of equal rights by many reformers, the history of

women in India has been eventful. The 73rd Amendment in the Constitution may be regarded as a watershed in the history of the state initiatives with regard to political empowerment of rural women. It had indicated a noticeable shift in the approach of the Indian state towards women. Earlier women were generally viewed as objects of development only. This Amendment made women the subject of development, an indispensable part of the decision making process. It was to improve women's representation that the policy of reservation was introduced.

The makers of Panchayati Raj System desired rural women should not only become a beneficiary of development, but more important is that they should become major contributors to it. They should be partners in growth and may be seen as contributor to political and business leadership of our country to facilitate the process of inclusion. The main intention of the policy makers behind this reservation is twofold one is the democratic justice and second is resource utilization (human). As the half of the population are women, the country development can't be achieved without the proper participation of women (Jain, 1994). Keeping in view the New Constitutional (73rd)

Amendment Act of 1993, the state Government of Uttarakhand has declared 50% reservation for women in institutions of local self governance in 2007. The latest Panchayati Raj elections in Uttarakhand state were held on this basis and as a result more than 50% women have come into *Panchayat* bodies. As reservation opened new avenues for rural women to empower themselves, hopefully political power would enable numerous women to improve their socio-economic conditions, participatory abilities and thereby tap leadership abilities. Keeping in view the above facts the present study was undertaken to investigate the relevance of socio-economic factors in promoting the emergence of women leadership.

MATERIALS AND METHODS

The study was carried out in the *Udham Singh Nagar*, *Dehradun* and *Tehri Garhwal* districts of *Uttarakhand* state. Three blocks from each district were selected by using chit method of simple random sampling. Thus, from district *Udham Singh Nagar*; *Rudrapur*, *Sitarganj* and *Bazpur* blocks, from district *Dehradun*; *Vikasnagar*, *Doimvala* and *Sahaspur* blocks and from district *Tehri Garhwal*; *Jaunpur*, *Chamba* and *Narendranagar* blocks were selected for the present investigation. Therefore, the list of all the Elected Women Representatives especially *Pradhans* from the selected blocks of all these districts were procured for the present investigation. Total number of women leaders in all the selected three districts were 325. The census method was used to select the respondents from the selected blocks. From each district investigator tried to contact all the women leaders however due to some reasons the total number of women leaders contacted from the selected blocks were 200. Some of the respondents could not be contacted as they were not available at the time of interview. Data were collected with the help of pre-tested semi- structured interview schedule. Observation and focused group discussion method were also used to support the quantitative data.

RESULTS & DISCUSSION

A leader is a person, whose guidance and direction are supposed to be accepted by the rest of the people in the community. Leader signifies a blend of socio-personal, economic and psychological characteristics in which they are placed. In fact, patriarchal culture and male dominated society which are dominant in India seem to inhibit women's participation in local governance through PRIs. Often they are excluded

from playing legitimate and active roles in rural community life owing to social and institutional constraints (Baviskar, 2005). In this context, analysis of the socio-economic background of the women leaders is important in shaping the nature and level of participation and this in turn relates to leadership, which implies that some of these factors are important in determining the nature of women's leadership at the grass root level through PRIs. Socio-economic background of women leaders (in terms of age, education, caste, family type, family size, type of house, occupation, income and economic status) were studied using appropriate measurement procedures and results have been presented under following heads.

Age refers to the chronological age of the respondents rounded to the nearest whole number at the time of interview. It determines the maturity of an individual and has a bearing on the thinking, experience and exposure of a person. Age is one of the determining attributes for the emergence of women leadership, particularly that of village leadership (Srivastava, 1967). Age exercises a great influence on affecting political participation. The general view is that the young and those in the middle age group participate more actively in the affairs of political institutions. It is believed that participation arises in early years peaks in the middle age and falls in the later stage. Keeping this in view, the age of the respondents have been studied and presented in Table 1. Traditionally, age is considered as an important factor in respect of one's status and prestige, particularly in rural society; it was once the privilege of the older people to occupy the various key positions in the villages (Bhargava, 1972:80 and Mehta 1972).

Table 1: Distribution of Respondents on the basis of age

Categories (years)	Frequency	Percentage
Young (<30 years)	31	15.5
Middle (31-46 years)	130	65.0
Old (47 and above years)	39	19.5
Total	200	100

Mean = 38.59 S.D. = 8.193 Min. = 22 Max. = 65

The results in Table 1 shows that emergence of young leadership has increased. It was evident from the Table that majority of the respondents were of middle age group i.e. 65 per cent belonged to the age of 31 to

46 years. There were only 19.5 per cent of respondents and 15.5 per cent of the respondents who belonged to old and young age groups respectively. The findings of the present investigation indicated that middle age group women dominated as leaders. This may be due to the reason that this age group of hill women participate actively in all social and political activities as most of the male population had migrated to other areas for job. The data further revealed that the presence of young women in the sample was an indicator of a positive social change in rural society. Few decades earlier younger women were far from public exposure but now it is quite possible for them to come to the centre stage of public activities. The findings are adequately supported by the studies of Athereya and Rajeswari (1998), Kittur (1992), Buch (2000) Baviskar (2005) Singh (1991) and Smitha (2007) where they have found that the provision of reservation for women in PRIs has resulted in more women leaders in the PRIs and also significant increase in interest among the new generation in this field, which is a positive sign for future.

Education plays an important role in the social mobility of an individual and provides knowledge and skills to participate in professional and social life. The leadership pattern and sharing of power is significantly shaped by education. Further, effective socio-political participation is possible with adequate education (Srinivas, 1969). Lack of proper education, economic imbalances, social taboos and immobility explain why women have remained politically dormant for so long.

Table 2: Distribution of Respondents on the basis of education

Categories	Frequency	Percentage
Illiterate	02	1.0
Primary	104	52.0
High School	33	16.5
Intermediate	33	16.5
Graduate and above	28	14.0
Total	200	100

As no educational qualification has been prescribed for the functionaries of PRIs so the findings depicted in the Table 2 shows that more than half of the respondents i.e. 52 per cent had primary education followed by equal number of respondents in high school and intermediate i.e. 16.5 per cent. Only 14 per cent had education upto graduate and above. Among all the respondents only one per cent of the respondents were

illiterate. As the total literacy rate of the state is 72.28% in which female literacy rate is 60.3%, thus the findings of the study also supported that 99 per cent of the respondents were literate. This is an important factor for creating the awareness to understand various developments in terms of rules and procedures regarding women electorate, behaviour of women actual functioning, the role of the elected chairpersons and representatives needed. The fact that education has been found an important factor is supported by D'lima (1983), Manikyamba (1989), and Vatsyayan (2005) who stated that economically well off group would not be politically active until and unless exposed to education that gives a sense of confidence and encouragement to participate actively in the politics. Education therefore not only resulted in active participation of women leaders on political front but also helped them to overcome the narrow and conservative ideas on social customs and traditions that have an adverse effect on their political participation.

Social stratification in Indian rural communities is generally based on caste distribution. In Indian situation, caste dominates which is associated with their status (Bhasker, 1997) and caste prescribes one's status and a person knows right from birth his/her position in the society (Singh, 1991 and Baviskar 2005).

Table 3: Distribution of Respondents on the basis of caste

Categories	Frequency	Percentage
General caste	90	45.0
OBC	69	34.5
Schedule tribe	14	7.0
Scheduled caste	27	13.5
Total	200	100

The data in the Table 3 indicates that 45 per cent of the respondents belonged to general caste followed by other backward caste (34.5 per cent) and schedule caste (13.5 per cent). Only seven per cent of the respondents belonged to schedule tribe category. The results supported the reservation policy of Government because the total percentage of women leaders was found in reserved categories i.e. 55 per cent is higher than women leaders in general category.

The pre-existing political experience of women leaders has a great relevance to their role as elected representatives in political institution. It can also provide

a picture of the potential of women leaders in *Panchayats*. It is obvious from the data in Table 4 that majority of the respondents 97.5 per cent were elected first time where as very few of them got elected twice or thrice under the PRIs. In the year 2007, as *Uttarakhand* got fifty per cent reservation for women in PRIs and that was the significant factor for why majority of women leaders got elected recently only. Thus it can be concluded that these emerging women leaders would be predominantly the first generation entrants to public and political life. The findings of present study are supported by the findings of Arun (1997) and Kukreti (2011) that majority of *Panchayat Raj* functionaries today were inexperienced as they were new entrants as leaders.

Table 4: Distribution of respondents according to political experience

Categories	Frequency	Percentage
First time elected	195	97.5
Second time elected	3	1.5
Third time elected	2	1.0
Total	200	100

Different types of families occur in a wide variety of settings, and their specific functions and meanings depend largely on their relationship to other social institutions. Sociologists have a special interest in the function and status of these forms in stratified societies.

Table 5: Distribution of respondents according to family type

Categories	Frequency	Percentage
Joint	146	73.0
Nuclear	54	27.0
Total	200	100

The term nuclear family system and joint family system are commonly used in Indian society and leadership is very much influenced by family system. Joint family promote effective leadership pattern supported by social status and reputation. The data in Table 5 focuses that majority of the women leaders 73 per cent belonged to joint family system. The remaining 27 per cent were found to be from nuclear family system. Hence, it may be concluded that today also in our rural society, joint family system still sustains. But the present findings are contradictory to the findings reported by Singh (1991) that most of the leaders come

from nuclear families. This may be due to the reason that culturally people in hills still follow traditional values and have strong bonds. It might be the reason why nearly seventy five per cent of women leaders belonged to joint family system.

Size of the family refers to the number of individuals of both sexes living together in a household and the data pertaining to the family size of the respondents (Table 6) under this study was classified under three categories viz. small (1-4 members), medium (4-6 members) and large (more than 6 members), which reflects that most of the respondents sixty six per cent belonged to large family size followed by medium (31.5%) and only few i.e. 2.5 per cent had small family size respectively. More number of family members might be due to dominance of joint family system in the study area. The findings showed that majority of the women leaders were from large family size which might be due to the fact that they get lot of support and confidence from other members of family who had helped them in taking decisions and taking care of domestic tasks.

Table 6: Distribution of Respondents according to Family Size

Categories	Frequency	Percentage
Small (1-4 members)	05	2.5
Medium (4-6 members)	63	31.5
Large (More than 6)	132	66.0
Total	200	100

Table 7: Distribution of Respondents according to Type of House

Categories	Frequency	Percentage
Pucca	125	62.5
Double storey	75	37.5
Total	200	100

Type of house refers to the habitation of the villagers, get constructed and live there with their family members. It is apparent from the data given in Table 7 that maximum number of respondents 62.5 per cent had pucca houses followed by Double storey 37.5 per cent. None of the respondents was found to have hut and kachcha type of houses. Thus, it can be inferred that in housing pattern, the majority of women leaders 62.5 per cent possessed pucca houses. The reason might

be their good socio economic status. Leadership is determined by occupation acquired from one's own skill and knowledge that significantly influences socio-political values and ideology. Apart from being a source of income, the occupation of a person determines the life style and the class status of that person (MacIver and Page, 1967). Occupation of women was classified into two categories as housewives and daily farm labour. The result of the study reveals that all the respondents were housewives. The investigator observed that most of the women leaders had their own land and most of the farming operations were performed by them. Therefore, none of them was found working on other fields as daily wage earner.

Table 8: Distribution of Respondents according to Husband/ Father Occupation

Categories	Frequency	Percentage
Agriculture	156	78.0
Unskilled	1	0.5
Skilled worker	5	2.5
Business	29	14.5
Service	9	4.5
Total	200	100

Most of the women leaders were housewives, therefore depended on their husband or their father's occupation to support the family. The data in Table 8 depicts that seventy eight per cent of the population belonged to agricultural background followed by 14.5 per cent were engaged in business, 4.5 per cent were in service or jobs, 2.5 per cent were skilled worker and only 0.5 per cent were unskilled worker respectively. The results indicates that more than three fourth of women leaders husband/father had agriculture as the major occupation. As the rural economy is agriculture based it might be the reason for most of the leaders to be from agriculture background. Land ownership is identified as a crucial factor in establishing dominance (Srinivas, 1966), which subsequently determines the socio- economic status influencing leadership positions. The data presented in Table 9 illustrates that a majority of respondents i.e. 87.5 per cent possessed land less than one hectare and belonged to marginal category followed by 5.0 cent in small category who possessed the land of 1-2 hectare and only one per cent of the respondents had land holding of more than four hectare. Only 6.5 per cent of the women leaders were in landless category. Some studies like Miglani (1993)

Table 9: Distribution of Respondents according to Land Holding

Categories	Frequency	Percentage
Landless	13	6.5
Marginal (<1 hectare)	175	87.5
Small (1-2 hectare)	10	5.0
Medium (2-4 hectare)	-	-
Large (>4 hectare)	02	1.0
Total	200	100

have found that those who own wetland would have upper socio-economic status that would influence the local power structure. It refers to the total income in rupees earned by the respondents or respondent's family from all sources in a particular year.

Table 10: Distribution of Respondents according to Annual Income

Categories	Frequency	Percentage
Low (Upto Rs. 25,588)	36	18.0
Medium (Rs. 25,589 to 43,641)	126	63.0
High (Rs.43,642 and above)	38	19.0
Total	200	100.0

The data in the above Table 10 shows that the highest number of women respondents 63 per cent were found in the medium income category (Rs. 25,589 to 43,641) followed by 19 per cent in high income category i.e. Rs. 43,642 and above and 18 per cent in low income group i.e. up to 25,588 respectively. There was no marked difference in percentage of respondents who belonged to low and high income groups. As 19 per cent belonged to high income group and 18 per cent belonged to low income group. The result of the study shows that most of the women leaders have emerged from an average economic status.

Table 11: Distribution of Respondents according to Socio Economic Status

Categories	Frequency	Percentage
Low (less than 15)	43	21.5
Medium (16 to 19)	126	63.0
High (20 and above)	31	15.5
Total	200	100.00
Mean = 17.49S.D. = 2.50 Min. = 13 Max. = 26		

The economic status of women is one of the major factors and source of her social and political status. It is clear from the Table 11 that more than half of the respondents (63%) having medium level of socio-economic status followed by low 21.5 per cent and high 15.5 per cent respectively. Thus, the analysis of the findings revealed that more number of the women leaders under PRIs belonged to medium level of SES, when they got the opportunity to enter in this arena. The reason of this finding can be enumerated as the respondents having medium level of socio economic status were more eager to participate and carrying out the *Panchayat* task. Though, the findings regarding socio economic status indicated that majority of the respondents belonged to agricultural background, having large family size, belonged to general caste, had primary level of education, pucca houses and possessed marginal land holding. Maximum number of women leaders were not holding any position in social organization other than PRIs. The cumulative results of SES of the study area depicted that majority of the respondents had medium level of socio economic status.

CONCLUSION

It can be concluded that present study highlighted the socio-economic characteristics of the women leaders in the PRIs. This can enable the policy makers and planners what type of women pre-dominantly takes the leadership roles. On the basis of the major findings of the study, it was concluded that emergence of women leadership at the grass root level was dominated by educated, middle aged and of reserved categories women with medium economic status. As majority of women leaders are first time elected and all of them are housewives. Thus, efforts should be made to train them for enhancing their leadership competency. Most of the women leaders belonged to marginal and small category of land holding. Only one percent women leaders has large land holding. Therefore, all section of women needs to be motivated to take up the leadership roles.

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Short Communication

Yield Gap Analysis of Gram and Summer Moong through Front Line Demonstrations

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ABSTRACT

Front line demonstration is an appropriate tool to demonstrate recommended technologies among the farmers. Krishi Vigyan Kendra, Gurdaspur (Punjab) conducted 19 demonstrations on gram and 34 demonstrations on summer moong during 2007-10. The critical inputs were identified in existing production technology through meetings and group discussions with the farmers. The average three years data revealed that an average yield of demonstration plot was 14.45 q/ha and 10.45 q/ha over local check 12.91 q/ha and 9.11 q/ha with 11.79 and 14.72 percent increase over control in gram and summer moong, respectively. The results showed that 2.54 and 0.8 q/ha technological gap, 14.97 and 7.10 q/ha technological index and 1: 2.5 and 1: 3.5 benefit - cost ratio were found in gram and summer moong, respectively.

Keywords: Adoption, Extension gap, FLD, Gram, Summer Moong, Technological gap, Technological index

India is the largest producer and consumer of pulses in the world. Indians consume 30 per cent of the world's pulses, but domestic production of pulses has not kept pace with population growth. Farmers have to put so many efforts to fulfil the need of the country. For this, farmer should be aware so that they can utilize the inputs wisely viz. seed, fertilizer, insecticides etc. without any economic losses. Since independence, a number of programmes have been launched to train the farmers. On the basis of continuous experience and the change in nature of technology, various extension approaches have been followed from time to time so that the farmer could take the benefit. The Farm Science Centres, which are presently known as the *Krishi Vigyan Kendras* (KVKs), were established by Indian Council of Agricultural Research (ICAR) throughout the country. The first KVK was established in 1974 at Pondichery under the control of Tamil Nadu Agricultural University. In Punjab, KVK, Gurdaspur was established in August 1982 to cater the training needs of three districts viz. Gurdaspur, Amritsar and Hoshiarpur. The demonstration conducted under the close supervision of the scientists of the National Agricultural Research system are known as FLDs as the technologies are demonstrated for the first time by the scientists themselves before being fed into the main extension system of State Department of Agriculture. The main

objective of the FLDs is to demonstrate newly released crop production and protection technologies and its management practices at the farmers' fields under different agroclimatic regions and farming situations. Almost all the crops were covered under front line demonstrations. Pulse crop is very important as it gives not only profitable income to the farmer, but also increases the fertility of soil.

In India, the area and production of pulses in Punjab is very low. In district Gurdaspur of Punjab, the area covered under gram and summer moong was 0.1 t/ha and 1.3 t/ha during the year 2009-10 (Anonymous 2010). Thus it is necessary, to demonstrate high yielding pulse varieties having resistance against biotic and abiotic stress so as to increase the production and productivity of the crops. As the farmers don't always follow the recommended practices, there is the need to identify the adoption gaps in the pulse production. KVK Gurdaspur has been conducting FLDs on gram and summer moong since 1991 and 1998, respectively. The objectives of present studies are to identify the adoption gaps in pulse production, to rectify those gaps through FLDs at farmer's fields, to compare the yield levels of local check and FLD fields and to collect feedback information for further improvement in research and extension programmes.

The present studies were carried out in KVK,

Gurdaspur during the year 2007-08, 2008-09 and 2009-10. The selection of the farmers was done as per allotment of FLD to KVK, Gurdaspur by Zonal Coordinating Unit, Zone I, Ludhiana, Punjab. The selected farmers were guided properly for the successful cultivation of pulses as per recommendations by PAU, Ludhiana. To identify the adoption gaps, personal meetings were also organized with farmers. Before conducting the FLDs, the soil samples of selected fields were tested and accordingly FLDs were laid out. The necessary steps for selection of farmers and site, layout of demonstrations etc. were followed as suggested by Choudhary (1999). The traditional practices were maintained in case of local checks. Regular visits by KVK scientists to FLD plots were made so as to ensure timely application of critical inputs and to solve other crop related problems. The extension activities like field days and *Kisan goshtis* were also organized at the demonstration sites as to provide opportunities for other farmers of the area. To ensure the benefits of recommended technologies, feedbacks from the farmers were collected so that further research and extension activities were improved. The data output were collected both in FLDs as well as control plots and finally the extension gap, technology gap, technology index along with benefit cost ratio were worked out (Samui *et al.*, 2000) as given below:

Technology gap = Potential yield – Demonstration yield

Extension gap = Demonstration yield – Farmers' yield

Technology Index = (Potential yield – Demonstration yield) / Potential yield

The performance of FLD gram and summer moong conducted during three years in district Gurdaspur has been discussed below:

a) Performance of FLD Gram: The performance of high yielding varieties of Gram for the year 2007-10 in during rabi season was analysed (Table 1). Later on all the recommended practices were followed during the whole crop season. During the year 2007-08, six demonstrations were conducted which covers an area of 2.4 ha in 5 villages and it produced an average yield of 11.60 q/ha while it was 10.50 q/ha in local check. Thus the tested variety PBG 5 showed an increase of 9.90 per cent as compared to farmer's practice. Similarly, during the year 2008-09, again five demonstrations were conducted on an area of 2.0 ha in 5 villages and it produced an average yield of 17.13 q/ha while it was

14.50 q/ha in local check. Thus, the tested variety PBG 5 showed an increase of 18.14 per cent as compared to farmer's practice. While, when the eight demonstration were conducted during the year 2009-10, the average yield was found to be 15.63 q/ha and 13.75 q/ha in the local check. Thus an increase of 12.0 per cent was observed in tested variety PBG 5 as compared to the farmer's practice.

b) Performance of FLD Summer Moong: The performance of recommended varieties of moong SML 668 was compared with the local variety sown by the farmer during the year 2007-08, 2008-09, 2009-10 (Table 2). All the recommended practices were followed in the FLD plot later on. Thus, the data revealed that during 2007-08, five demonstrations were conducted which covers an area of 1.0 ha in 5 villages and it produced an average yield of 10.40 q/ha while it was 9.2 q/ha in local check. Thus the tested variety SML 668 showed an increase of 13.0 per cent as compared to farmer's practice. Similarly, during the year 2008-09, 20 demonstrations were conducted, which covers an area of 8.0 ha in 20 villages and it produced an average yield of 10.82 q/ha while it was 9.38 q/ha in local check. Thus, the tested variety SML 668 showed an increase of 15.35 per cent as compared to farmer's practice. While, nine demonstrations were conducted during the year 2009-10, the average yield was found to be 10.13 q/ha and FLD plot 8.75 q/ha in the local check. Thus an increase of 13.60 per cent was observed in tested variety SML 668 as compared to the farmer's practice.

c) Analysis of Gap adoption: During the year 2009-10, the productivity of gram and summer moong in district Gurdaspur was 11.29 and 10.22 q/ha, respectively, which is quite low as compared to the potential productivity i.e 17.0 q/ha in gram and 11.25 q/ha in summer moong (Table 3). Then, the reason was found out behind the low productivity of these crops in district Gurdaspur. The data in Table 3 revealed that the farmers were not applied the critical inputs according to the requirement of the crop. As in gram and summer moong, there is gap in adoption as the farmers used unrecommended varieties. The seed rate used by the farmers was not according to recommendation as in summer moong 33.3% and in gram 25% less seed used. The adoption gap was found to be 100% in case of seed treatment. Farmers didn't use *rhizobium* culture or any fungicide for the treatment of seed, which leads to the appearance of diseases. Farmers didn't even use the nitrogenous fertilizer due

to misconception of leguminous crops. Phosphorus is also the essential nutrient for the production of pulses and it was found to be 100% adoption gap even in number of sprays as well as in sowing method. Thus, these all factors led to reduction in yield.

d) Cost-Benefit ratio: The cost benefit ratio (C:B) was calculated during different years in gram and summer moong. In gram crop, C:B ratio was 1:3.1, 1:2.6 and 1:1.9 during 2007-08, 2008-09 and 2009-10, respectively. Similarly in summer moong, it was 1:2.7, 1:1.9 and 1:5.8, respectively during above mentioned consecutive years.

The results are in favour of FLD plots as compared to farmer's practice during all the three years. These all were due to proper follow up of the recommendations in the FLD plots like use of recommended varieties, timely sowing of the crop, proper seed rate, seed

treatment, application of fertilizer etc. which were found to be absent in farmers' fields. The results are also corroborated with the study of Yadav *et al.* (2007) and Singh *et al.* (2005a, b). The results clearly indicate the positive effects of FLDs over the existing practices toward enhancing the yield of gram- summer moong in district Gurdaspur of Punjab (Table 1) with its positive effect on yield attribute (Tomar *et al.*, 2003 and Tiwari *et al.* 2003). The extension gap showed an increasing trend (Table 1). The extension gap ranging between 1.10- 1.88 q/ha in gram and 1.20- 1.44 q/ha in summer moong during the period of study emphasizes the need to educate the farmer through various means for adoption of improved agricultural production to reverse the trend of wide extension gap. The trend of technological gap ranging between 0.87- 5.40 q/ha in gram and 0.43-1.12 q/ha in summer

Table 1: Productivity, technology gap, extension gap and technology index in gram and summer moong under FLDs

Year	No. of Demonstrations	Area (ha)	Average yield (q/ha)			Percentage increase over control	Tech- nology gap (q/ha)	Exten- sion gap (q/ha)	Tech- nology index (%)
			Potential	Demonstr- ation	Local check				
Gram (var. PBG 5)									
2007-08	6	2.4	17.0	11.60	10.50	10.46	5.40	1.10	31.76
2008-09	5	2.0	17.0	16.13	14.50	11.24	0.87	1.63	5.11
2009-10	8	2.0	17.0	15.63	13.75	13.67	1.37	1.88	8.06
Mean	6.33	2.13	17.0	14.45	12.91	11.79	2.54	1.53	14.97
Summer moong (SML 668)									
2007-08	5	1.0	11.25	10.40	9.20	13.04	0.85	1.20	7.55
2008-09	20	8.0	11.25	10.82	9.38	15.35	0.43	1.44	3.82
2009-10	9	3.6	11.25	10.13	8.75	15.77	1.12	1.38	9.95
Mean	11.33	4.2	11.25	10.45	9.11	14.72	0.80	1.34	7.10

Table 2: Benefit - cost ratio in gram and summer moong under Front line demonstrations

Crop	Average yield (q/ha)		Average gross return (Rs./ha)		Average net return (Rs./ha)		Benefit cost ratio
	Demonstration	Local check	Demo	Local check	Demo	Local check	
Gram (var. PBG 5)							
2007-08	4873	3823	29000	26250	24127	22420	1:3.1
2008-09	5357	3137	51390	43500	46033	40363	1:2.6
2009-10	8470	5260	78125	68750	69655	63490	1:1.9
Mean	6233.33	4073.33	52838.33	46166.67	46605	42091	1: 2.5
Summer moong (SML 668)							
2007-08	3923	2950	22880	20240	18957	17290	1:2.7
2008-09	4245	2480	37870	32830	33625	30350	1:1.9
2009-10	6079	5860	35455	30625	29376	24765	1:5.8
Mean	4749	3763.33	32068.33	27898.33	27319.33	24135	1: 3.5

Table 3: Comparison between recommended and existing practices under gram- summer moong FLDs during 2007-10

Item	Recommended practice	Existing practice	Adoption gap (%)
Gram (var. PBG 5)			
Variety	Recommended varieties of PAU	Local	Yes
Seed rate	40 kg/ha	30 kg/ha	25.0
Seed treatment	Rhizobium culture -2.5 pkt/ha	Nil	100
	Captan/Thiram- 3 g/kg seed	Nil	100
Fertiliser application	N-15 kg/ha	Nil	100
	P- 20.0 kg/ha	Nil	100
	K- Nil	Nil	Nil
	Micro nutrient- Nil	Nil	Nil
Number of sprays	2-3	1	Yes
Sowing method	Pora method	Broadcast	Yes
Summer moong (SML 668)			
Variety	Recommended varieties of PAU	Local	Yes
Seed rate	37.5 kg/ha	25 kg/ha	33.3
Seed treatment	Rhizobium culture -2.5 pkt/ha	Nil	100
	Captan/Thiram- 3 g/kg seed	Nil	100
Fertiliser application	N-12.5 kg/ha	Nil	100
	P- 40.0 kg/ha	Nil	100
	K- Nil	Nil	Nil
	Micro nutrient- Nil	Nil	Nil
Number of sprays	2-3	1-2	Yes
Sowing method	Drill/Kera/Pora	Broadcast	100

moong during the period of study reflects the farmers cooperation in carrying out such demonstrations with encouraging results in subsequent years. The technology gap observed may be attributed to the dissimilarity in soil fertility status and weather conditions. The technology index showed the feasibility of the evolved technology at the farmers' fields. The lower the value of technology index, the more is feasibility of technology. Fluctuation in technology index (ranging between 5.11-31.76 in gram and 3.8-9.95 in summer moong) during the study period may be attributed to the dissimilarity in soil fertility status, weather conditions, insect-pests and diseases (Katare *et al.* 2011). There are adoption gaps in the demonstrated plots *vs* farmers' practice and with the very clear results in front of the farmers between these plots, they automatically leads toward adoption of the technology. Some feedbacks were also recorded by interviewing the farmers. These are given below:

- Non-availability of seeds of recommended varieties in the market.
- Lack of availability of single super phosphate in time.

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Short Communication

Social-Profile and Entrepreneurial Characteristics of Successful and Unsuccessful SHG Micro-Entrepreneurs in Tamil Nadu

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ABSTRACT

The status of rural women in independent India occupies an important role and all efforts are being made to establish the significant place that she can play in the development of her own self and the society at large. Keeping this in mind, the Government of India launched *Swarnajayanti Gram Swarozgar Yojana* (SGSY) in 1999 to empower rural women. In this context, a study was conducted in Vellore district of Tamil Nadu to assess the social-profile and entrepreneurial characteristics of SHG members under SGSY. Following stratified random sampling, data were collected from 150 SHG micro-entrepreneurs. They further divided into Successful Self-Help Group Micro-Entrepreneurs (SSMEs) and Unsuccessful SHG Micro-Entrepreneurs (USSMEs) based on modified SHG micro-entrepreneurial success and unsuccess index specifically developed for the study. Half of Self-Help Group Micro-Entrepreneurs (SMEs) found to be middle aged, mostly educated up to middle school, had membership in two organizations. Three-fourth of the SMEs fell under the medium socio-economic status category. A huge difference in family size was noticed. Only about 38.60 per cent of SMEs had undergone two or more trainings. Hence there is need for capacity building of SHG members in social participation and achievement motivation.

Keywords: Self-Help Groups, Successful and Unsuccessful Micro-Entrepreneurs, SGSY

The focus of development planning in India has been rightly on the alleviation of rural poverty since Independence. Rural India, however, continues to suffer from high incidence of poverty in spite of strengthening of anti-poverty programmes in successive years. In percentage terms, poverty level has reduced from 56.44 percent of the population in 1973-74 to 37.2% in 2004-05 to 29.8% in 2009-10, with rural poverty declining by 8.0 percentage points from 41.8% to 33.8%. In absolute terms, however, the number of rural poor has remained more or less static. To reduce poverty especially in rural areas a self employment programme namely *Swarnajayanti Gram Swarozgar Yojana* (SGSY) has been launched in 1999.

Swarnajayanti Gram Swarozgar Yojana aims at establishing a large number of micro-enterprises in the rural areas, building upon the potential of the rural poor. It is rooted in the belief that rural poor in India have competence and given the right support can be successful producers of valuable goods and services. The assisted families, known as *swarozgaris*, may be individual(s) or self-help groups. For the implementation of key project activities, the SGSY

adopts project approach. Towards this end, SGSY is conceived as a holistic programme of developing rural micro-enterprises covering all aspects of self-employment, *viz.*, capacity building, planning economic activities, infrastructure build-up, technology, credit and marketing linkages.

The present study was purposefully conducted in Vellore district of Tamil Nadu to study the social profile and entrepreneurial characteristics of SHG members under SGSY. This district was chosen because of presence of highest number of *swarozgaris* in comparison to all other districts of Tamil Nadu. Three taluks were randomly selected from the district and from each chosen taluk, five villages were selected randomly. From each chosen village, ten SHG Micro-Entrepreneurs (SMEs) were selected by using simple random sampling technique. These 150 SMEs were originally belongs to 67 SHGs. Though the basic intention of the study was assessing the functioning of SMEs and its impact on their empowerment, the survey revealed the presence of successful and unsuccessful groups among the SMEs. Thus the researchers of this paper, restricted themselves to analyse significant social

profile and entrepreneurial characteristics which differentiates them into Successful and Unsuccessful SHG Micro-Entrepreneurs (USSMEs). These successful and unsuccessful micro-entrepreneurs were categorized after scoring them with a modified SHG micro-entrepreneurial success and unsuccessful index specifically developed for the study. Thus data on social profile and entrepreneurial characteristics for the study were collected by using a pre-tested structured interview schedule. Among the SMEs, 108 found to be in successful and 42 in unsuccessful micro-entrepreneurs. Their social-profile and entrepreneurial characteristics are given in results and discussion.

The results are given in the Table 1 and discussion is as follows:

Age: It is evident from Table 1 that the SSMEs were younger than the USSMEs. The rural women in the old age thought that starting out an enterprise and moving out of village for the entrepreneurial activity is not prudent. These attitudes led them to become of USSMEs. Further this result is in accordance with the result of Venkatesan (2001). He reported that majority of the active SHG farm women belonged to middle (45.30 %) aged categories.

Education: Literacy level of SMEs might have significant influence on the perception towards active social participation, training needs and credit utilization in entrepreneurial activities and extent of empowerment. It is clear from the Table 1 that about two-third of them educated up to middle school level making them to be active in social participation and attending training out of village. The educational attainments perhaps help them to supervise the key entrepreneurial activities like credit utilization, selling the product etc.

Occupation: Occupational status creates and or reflects the socio-economic status and well-being of rural folk. Only 10 out of 150 SMEs were found to be actively involved in agricultural activities, besides the chosen economic activity. About half of the SSMEs were involved in labour work. Thus previous occupational status made them to choose the present micro-entrepreneurial activity and that too based more or less on agriculture. Further, the objective of the SGSY programme also intended to make the rural folk to start entrepreneurial activities based on the local agricultural resources. Thus the behavior of choosing the agri-preneurial activity as full time work was reflected.

Landholdings: The situation of landlessness prevailed among half of the both the group of SMEs. But the SSMEs, in majority, had more farm holdings than USSMEs group. The land possession may be the reason for successful conduct of micro-enterprises as it gives base for livelihood security and the confidence to go for new ventures.

Caste: Due to their higher acceptance as socio-economically rich, most of the backward and most backward SHG members became successful micro-entrepreneurs. It is evident from the fact that no forward caste SHG micro-entrepreneurs found in the unsuccessful category. Thus the government and SHG promotion institutes have to design micro-entrepreneurial programme, for the scheduled caste separately.

Social participation: Table 1 show that nearly half of SSMEs had membership in more than one organization. In the case of USSMEs, it is interesting to note that about 61.90 per cent of them maintained membership only in one organization. Thus, the high rate of exposure to the outside their household made the SSMEs to gain knowledge and exchange their viewpoints in different occasions at different places which molds them to take risk to a certain extent for the newly started venture.

Material possession: For successful entrepreneurship, material possession is a significant factor. This makes one entrepreneur to go for basic and higher investments. It is clear that the successful groups mostly converge around the moderate to high material possession category than the unsuccessful group. Above of all, out of 150 SMEs, 43 had low material possession and most of them belonged to unsuccessful category. Thus the micro-enterprise promoting institutions should take material possession as key variable to groom rural SHG micro-entrepreneurs.

Family size: Family size invariably influences the socio-economic status of rural women. Table 1 show that, overwhelming majority of the SSMEs belonged to small and medium family category. This might be the reason for them to plough back considerable amount of money to the micro-enterprise leading to the more investment. Whereas in the case of USSMEs, though not considerable variation in family size, but being a larger family in the rural household for long years before introduction of SHG based SGSY, they might have

Table: 1. Distribution of successful and unsuccessful micro-entrepreneurs according to their social-profile and entrepreneurial characteristics

Categories	Successful micro- entrepreneurs (SSMEs) (n=108) <i>f</i>	Unsuccessful micro- entrepreneurs (USSMEs) (n=42) <i>f</i>
Age		
Young (< 35 years)	39	12
Middle(35-50 years)	56	24
Old (> 50 years)	13	6
Total	108	42
Education		
Primary school level	18	8
Middle school level	72	27
High school	17	7
College level	1	0
Total	108	42
Occupation		
House hold work	22	22
Labourer	19	19
Agriculture	1	1
Total	108	42
Landholding		
Landless	52	17
Marginal	26	16
Small	17	3
Medium	10	6
Large	9	0
Total	108	42
Caste		
Scheduled caste	14	9
Most backward caste	43	18
Backward caste	46	15
Forward caste	5	0
Total	108	42
Social participation		
Member in one group	61	26
Member in two groups	33	11
Member in three groups	9	3
Member in more than three groups	5	2
Total	108	42
Material possession		
Very Low	0	0
Low	33	10
Moderate	58	21
High	13	7
Very High	4	4
Total	108	42
Family size		
Small	76	7
Medium	23	19

Large	9	16
Total	108	42
Type of House		
Mud wall not thatched	29	16
Brick wall	52	17
Concrete house	27	9
Total	108	42
Socio economic status		
Low status	11	6
Medium status	84	33
High status	13	3
Total	108	42
Training undergone		
Attended no training	0	0
Attended one training	17	1
Attended two training	39	19
Attended three training	36	13
Attended more than three training	16	9
Total	108	42

incurred debts which hardless then to plough back money to the venture.

Type of House: Collectively about 46.00 per cent of SMEs lived in brick walled houses and only about one fourth (24%) lived in concrete house. It was observed in data collection that, since support for enterprise emanates from SHG, the variable 'type of house' may not be a significant one for SSMEs.

Socio-economic status: It can be seen from the Table 1 that most of the SMEs fell under the medium socio-economic status category. The SSMEs in majority belonged to this category. It is evident that once the basic needs fulfilled and debt cleared, SHG members started to have their own micro-enterprises. The medium socio-economic status motivated them to manage the enterprise untiringly so as to get extra incomes and there by social status.

Training undergone: It is evident from the Table 1 that more than one-third of SMEs had attended two to three trainings. The SMEs who attended more than three trainings were only 16.66 per cent and in the data collection it was found that all are belonged to successful group. Though all SMEs are started up with required training on product development still one-fifth of them fell in the very unsuccessful category. The SHG promoting institutions has to give training not only on product selection and marketing but also finance management and entrepreneurial diversification. This will ensure sustained increased income among the rural SMEs, uplifting out of poverty line.

CONCLUSION

Women are vital part of the human resource of a country; they are the agents of change in the society. The Self Help Groups under SGSY plays an important role in the capacity building of rural women. Now a days the members of SHGs under SGSY are transforming themselves as SHG micro-entrepreneurs. Hence understanding the social-profile and entrepreneurial characteristics of SHG members under SGSY became necessary. After survey and analysis of data it was found that majority of the SHG micro-entrepreneurs belonged to middle aged category, attended upto eighth standards and less than ten per cent were previously engaged in agricultural activities. As per the economic condition is concerned, majority had less than 10 cents of land, moderate level of material possession and lived in brick walled house. As far as social status is concerned, majority of them belonged to backward castes and enjoyed medium socio-economic status. When it came to social participation, remarkable variations were found between SSMEs and USSMEs but put together all SMEs got moderately low score. Since majority of the SMEs were middle aged and educated and were landless and had marginal land holdings both farm and non-farm, need based micro-enterprises need to be facilitated. Thus for successful conduct of SHG micro-enterprises and achieving greater empowerment, the implementing agencies should undertake necessary activities under the SGSY. Focus on these above areas will enhance the effectiveness of this program, thereby facilitating empowerment.

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Short Communication

Ill Manufactured School Furniture: A Cause of Musculo-skeletal Disorders

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ABSTRACT

The schools years are said to be the formative years of a child, therefore the classroom should be designed in such a manner that it does not impose physical and mental strain on them. A comparative study was undertaken to find out the postural deformity among school children while using furniture present in their school and ergonomically designed furniture. Total 120 children were selected from the Campus School of Pantnagar. Purposive sampling was used for the experimental study and data were gathered by observation through necked eyes as well as through video recording. Subjects were allowed to work on both the furniture. Results showed that postural deformity was minimum while using ergonomically designed furniture as compare to ordinary furniture.

Keywords: Posture, Postural deformity, Ergonomic table and chair

The postures are of extreme importance in the work because they represent accommodations of the musculo-skeletal system to objective aspects of the workstation, besides some psycho-motion attitudes. To that extent, ergonomically adopted workstations should allow neutral postures, that is, not to induce that and improve safety on posture. This can be done mainly in two ways i.e. by improving the design and by training the pupil to use correct posture.

Pain fatigue and disorders of the musculo-skeleton system may result from sustained inadequate working postures and repetitive movements that may be caused by poor work situations. Musculo-skeleton pain and fatigue may themselves influence posture control, which can increase the risk of errors and may result in reduced quality of work or production. Good design and proper organization of work are basic requirements to avoid improper sitting environments.

Sitting is the most frequently assumed posture. Prolonged static sitting is frequently accompanied by discomfort and musculo-skeleton complications that result from sustained immobility. It has been seen that there is a correlation between static seated postures and back discomfort, with the conclusion that individuals are better able to sit for prolonged periods if they are able to change their posture throughout the day.

Localized muscular fatigue and pain can result from posture immobilization (Couto, 1995). Paradoxically this may seem to conflict with the need to keep children in one location for the majority of time. By keeping in mind the above problems associated with school children the study was planned with the following objectives;

1. To collect the relevant anthropometric data of the selected children
2. To study the ordinary and ergonomically designed furniture and to compare it with the standards of BIS.
3. Assessment of postural stress and subjective feeling regarding comfort/uncomfort

In the present study both descriptive and experimental design was planned. To study the suitability of ergonomically designed furniture, present study was carried out in the Campus school of U.S. Nagar block of Uttarakhand. For the present study complete list of the classes were made. There were three sections in each class. Hence fish bowl method was used to select the class as per age group required in the study. As per the design of furniture which were comprised of children of 6-10 years i.e. from class first to fifth, 11 to 14 years i.e. 6th to 8th class and 15-19 years

i.e. 9th to 12th class. For the selection of sample an exhaustive list of all the students of selected classes were prepared, than with the help of random number table altogether total of 120 students were selected which was comprised of 40 children of each age group out of which 20 respondents were male whereas 20 were female in each group.

The questionnaire with the addition of videography was found to be appropriate tool for gathering information pertaining to the research work. Anthropometric measurements like (Popliteal height, buttock Popliteal length, thigh clearance and knee height) and furniture dimensions like (seat height, seat depth, seat width and height of knee zone) were measured using anthropometric kit.

Part of the school children (n=24, 12 girls and 12 boys) were randomized for video recording which were carried out during normal lessons in their regular classroom. The actual distance of the camera from the subject was between one meter to two meter and the view was zoomed in on the subject. Recording focused one pupil on an average for 30 minutes session.

Bones, muscles and other minute and detailed dimensions of anatomy are mostly referred for medical and other necessities. But even while designing products for human use, the body dimension and the anthropometry has to be considered. While designing individual items or products one has to take into consideration the dimensions of the product, their layout pattern in a given space, the ease of reach, use etc. to match with the anthropometry of the user.

The school children's anthropometric measurements are reported in Table 1 and the dimensions of the furniture are given in Table 2. In this study tables and chairs were measured in relation to the

subject's anthropometric measurements. It can better be seen by the table, that there was a great mismatch between seat height and the Popliteal height, seat depth and buttock popliteal length, seat width and hip breadth of the students and also a great difference can be seen between the thigh clearance and the height of knee zone due to that students were having a severe problem in their knees they felt pain during their school time. The students of VIth and Xth standards sit on the benches, that is why they were not having back support during sitting and only IVth standard students were having backrest in their chair but that height was also not up to the mark. When we compare the dimensions of the furniture with the BIS then we can see that none of the dimension matches with the BIS somewhere it was higher the standards given by BIS and on the other hand it was below somewhere.

School based surveys have shown a high prevalence of backache, and particularly low pain, ranging from 20-51% among children (Troussier, 1999). MSD/BP amongst school students is also of great concern because the strongest predictor, of having future back pain is a previous history of such symptoms (Troup *et al.*, 1987). In addition, a large proportion of adult sufferers report first onset of back pain in their early teenage years or early adult life (Papageorgiou *et al.*, 1996).

The analysis of video recording showed that among the children of IVth standard, postural changes were very less and the major problem was found in their legs as there were having very less space in between the table and their knees due to that they flexed their legs backward or kept crossed. The problematic zone for the children of VIth and Xth standards were severe pain in their back as not having backrest. During the recording it was also seen that student's furniture was

Table 1: Mean, 5th and 95th percentile of anthropometric measurement of school children

Variable	IV standard children			VI standard children			X standard children		
	M	5 th	95 th	M	5 th	95 th	M	5 th	95 th
Sitting height	68	60	75	72	68	75	81	74	87
Popliteal height	39	34	45	43	37	48	43	47	58
Buttock popliteal length	36	32	42	42	35	53	47	41	55
Buttock knee length	44	39	49	47	38	52	56	48	61
Thigh clearance	25	19	33	28	24	32	35	30	42
Knee height	45	43	55	48	44	55	49	56	62
Hip breadth	25	20	29	27	23	31	32	48	58

Table 2: Mean, 5th and 95th percentile of furniture dimensions of school furniture

Variable	School furniture (cm)			Ergonomic furniture (cm)			BIS (cm)		
	IV	VI	X	IV	VI	X	IV	VI	X
	standard	standard	standard	standard	standard	standard	standard	standard	standard
Backrest height	20	-	-	32	35	39	25+3	42+3	48+3
Seat height	31	32	40	27	35	41	30+3	34+3	38+3
Seat depth	28	32	40	30	28	34	20-30	32-34	38+3
Knee zone height	48	56	70	48	54	63	46	52	58
Seat width	34	41	45	52	52	52	30	32	38
Table height	58	61	73	64	71	75	52+3	58+3	64+3
Table depth	32	40	28	38	35	36	45	45	45

Table 3: Opinion about ordinary and ergonomic table and chair

Category	Ist category		II category		III category	
	Ordinary	Ergonomic	Ordinary	Ergonomic	Ordinary	Ergonomic
Very uncomfortable	-	-	4 (10)	3(7.5)	-	2 (5)
Uncomfortable	3 (7.5)	10 (25)	8 (20)	1 (2.5)	15 (37.5)	3 (7.5)
Acceptable	25 (62.5)	22 (55)	11 (27.5)	12 (30)	19 (47.5)	7 (17.5)
Comfortable	12 (30)	8 (20)	14 (35)	19 (47.5)	6 (15)	18 (45)
Very comfortable	-	-	3 (7.5)	5 (12.5)	-	10 (25)

not having the proper space for keeping their bags therefore they have to accommodate their bags behind them and it results in lesser space for sitting themselves.

During the entire period of the study two postures were found very common that was arm supported on the table and learning forward on the table while reading and writing, which is a poor back posture.

To support the data collected through video recording the opinion of students were also recorded. It can be envisaged from Table 3 that the maximum percent students of first category found the both type of furniture as acceptable whereas the maximum students of second category (35% and 47.5%) found the ordinary and ergonomically designed furniture as comfortable and incase of the students of third category 47.5 per cent students reported their ordinary furniture as acceptable and there were 45 percent students who found ergonomically design furniture comfortable and 25 per cent found it very comfortable.

CONCLUSION

The study concludes that the school furniture did not match up to the school children's anthropometric measurements on an average. There is a need to design

new furniture that could be easily adjusted to the size of the school children and provide a better sitting posture for school children so that the postural stress and any postural deformity can be avoided among school children.

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Short Communication

Knowledge Level of Broiler Farmers in Kathua District of Jammu and Kashmir

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ABSTRACT

To assess the knowledge level of the broiler farmers 240 broiler farmers (120 peripheral and 120 distant) from the villages of Kathua District of Jammu and Kashmir were personally interviewed on a well structured schedule. It was found that 51.67 per cent of the broiler farmers had medium level of knowledge. Nearly 28 per cent had low and only 1\5th had medium level of knowledge regarding improved broiler keeping practices. The overall knowledge index was 47.32 which was 47.67 for the peripheral and 46.97 for the distant poultry farmers. Thus a knowledge gap of more than 50 per cent has been found that need to be abridged to get the desired benefits from the vocation. A non significant difference among both the categories of the selected broiler farmers has been found with respect to the knowledge about advocated broiler keeping practices.

Keywords: Knowledge level, Broiler farmers

The poultry industry has grown rapidly in the last four decades from a backyard farming activity to a modern and highly scientific industry. Now poultry industry has emerged as the most dynamic and progressive segment of the our livestock economy as evident from the production level touching 45 billion eggs and 891 million broilers with a compounded annual growth rate of 8 and 15 per cent, respectively. India today occupies 5th and 19th positions in the world in egg and poultry meat production, respectively.

In view of the growing pressure of population and limited scope of additional income through crop production, income generation through poultry keeping holds unique importance. Poultry keeping is now considered to be an important tool for self employment. To promote the adoption of emerging advances in agriculture technologies and to increase the level of adoption of poultry keeping practices, the poultry farmers must be imparted training on the aspects which they do not know or poorly know. As it has been reported in several studies that technology not known or partially known by the respondents lead to technological gap. Hence it was felt incumbent to examine the existing level of knowledge of the poultry

farmers. Keeping this in background, the present investigation was conducted with the following specific objective to study the extent of knowledge of the recommended broiler keeping practices possessed by the poultry farmers.

The present study was conducted in the purposively selected Kathua District of Jammu and Kashmir. The basis for selecting the said district is that it had maximum number of poultry farms in operation at the time of conduct of investigation. The proposed district consist of eight blocks, of which four blocks *viz.*, Kathua, Barnoti, Hiranagar and Ghagwal were selected on the basis of maximum number of poultry farms functioning in these blocks. From each selected block, 30 peripheral farmers i.e. within the radius of 10 km distance from the block poultry demonstration centre of the department of animal husbandry, J&K Government and 30 distant poultry farmers i.e. situated at a distance of more than radius of 10 Km from the poultry demonstration centre of the concerned block were selected following simple random sampling technique thereby constituting a sample of 240 poultry farmers (120 peripheral and 120 distant poultry farmers). On the basis of the objectives of the study, a

knowledge test was specifically developed for the purpose. Thereafter, the required information was obtained through personal interview technique and translated in the form of quantitative data on different aspects of poultry farming *viz.*, chick procurement, brooding practices, litter management, temperature regulation, feeding practices, watering, equipment and spacing, diseases and parasites, vaccination and sanitation.

Knowledge, a body of understood information possessed by an individual is one of the important components of the adoption behaviour and plays an important role in the adoption of an innovation or any new idea. Even it has been considered by many others as a pre-requisite condition for adoption.

To get a vivid portrait of the respondents on profile basis, they were categorized into three groups i.e. high, medium and low on the basis of calculated mean and standard deviation of knowledge scores obtained by the respondents. It is evident from the data presented in Table 1 that just more than half of the respondents (51.67%) had medium level of knowledge about scientific broiler keeping practices. Besides, 27.08 per cent low and about one-fifth of them (21.25%) possessed high level of knowledge of recommended broiler keeping practices. In case of peripheral poultry farmers, nearly half of them (49.17%) possessed medium level of knowledge. Moreover, the peripheral poultry farmers who possessed high and low level of knowledge regarding recommended broiler keeping practices were 24.26 per cent and 26.67 per cent, respectively. Besides in case of distant poultry farmers, more than half of the respondents (54.16%) had medium level of knowledge followed by 27.08 per cent having low and nearly 1\5th having high level of knowledge (21.25 per cent regarding recommended broiler keeping practices.

The results are in concordance with the findings of

Kavad *et al.* (1997-98), Satyanarayan and Rao (2000), Sankhala and Sharma (2001), Choudhary and Panjabi (2002), Issar and Dhakar (2002) and Paul *et al.* (2003) who reported that majority of the respondents possessed medium level of knowledge. Besides, the findings are in contradiction with those of Dana *et al.* (1995), Chauhan and Rathore (1997-98) and Bhatti and Sharma (2002) who revealed that majority of the respondents had low level of knowledge. These results might have come because of the reason that the sampled poultry farmers were associated with the vocation of poultry farming for many years which might have raised their practical knowledge to the medium and high levels. However, those were recently associated with the vocation might have gained proportionally low level of knowledge. To get a brief view of the overall knowledge regarding various major practices of broiler keeping possessed by the respondents, the overall score for each major head was summed up and results have been presented in Table 2.

A perusal of data incorporated in Table 2 revealed that from among the major practices, respondents had excellent knowledge of watering practices with Mean Per cent Score (MPS) 77.24 followed by chick procurement practices (MPS 63.12), litter management (MPS 60.17), sanitation (MPS 48.50) and brooding practices (MPS 45.66) which were placed at Ist, IInd, IIIrd, IVth, Vth and VIth places respectively by them. However they possessed poor knowledge regarding diseases and parasites (MPS 38.48), equipment and spacing (PS 32.74) and feeding (MPS 31.06). Besides, very poor level of knowledge was found to be possessed by the poultry farmers regarding temperature regulation which is infact very crucial practice for successful poultry production. Further both the categories of the respondents had almost similar magnitude of knowledge as is evident from the same ranks assigned to the major practices representing the knowledge domain on broiler farming by them.

Table 1: Profile of the respondents according to adoption of recommended poultry keeping practices (n= 240)

Level of knowledge	Peripheral farmers		Distant farmers		Total	
	F	%	F	%	F	%
High (> 54.87)	29	24.16	22	18.34	51	21.25
Medium (32.74- 54.87)	59	49.17	65	54.16	124	51.67
Low (< 32.74)	32	26.67	33	27.08	65	27.08
Total	120	100.00	120	100.00	240	100.00

F: Frequency, %: Percent

Table 2: Extent of overall adoption of recommended poultry keeping practices by the poultry farmers (n= 240)

Knowledge domain	Peripheral farmers		Distant farmers		Total		'Z' Value
	MPS	Rank	MPS	Rank	MPS	Rank	
Chick procurement	63.34	II	62.91	II	63.12	II	0.74 ^{NS}
Brooding practices	46.62	VI	44.70	VI	45.66	VI	2.98*
Litter management	59.70	III	60.65	III	60.17	III	1.04 ^{NS}
Temperature regulation	21.60	X	20.89	X	21.24	X	0.87 ^{NS}
Feeding practices	31.52	IX	30.60	IX	31.06	IX	0.92 ^{NS}
Watering practices	77.41	I	77.08	I	77.24	I	0.10 ^{NS}
Equipment and spacing	34.07	VIII	31.41	VIII	32.74	VIII	2.04*
Diseases and parasites	40.83	VII	36.14	VII	38.48	VII	3.27*
Vaccination	48.53	V	48.47	V	48.50	V	0.47 ^{NS}
Sanitation	53.12	IV	56.87	IV	54.99	IV	2.78*
Overall	47.67		46.97		47.32		0.84 ^{NS}

MPS: Mean per cent Score, *: Significant at 5 % level NS: Non Significant

However, in order to find out the significance of difference between both the categories of the respondents with respect to the knowledge possessed by them, Z-test was applied. It can be observed from the calculated values of Z presented against each major aspect of knowledge domain that the obtained values for chick procurement, litter management, temperature regulation, feeding, watering, and vaccination were 0.74, 1.04, 0.92, 0.10 and 0.47, respectively which all are less than the respective tabulated values. Therefore, it can be concluded that there was no difference between peripheral and distant poultry farmers with respect to their knowledge about chick procurement, litter management, temperature regulation, feeding, watering and vaccination practices.

Whereas, the calculated Z-values for brooding practices, equipment and spacing; diseases and parasites and; sanitation were 2.98, 2.04, 3.27 and 2.78, respectively. It led to the conclusion that there was a significant difference between peripheral and distant poultry farmers with respect to these practices. Besides, overall Z-value was 0.84 which is less than the tabulated value. Thus it can be concluded that overall there was no difference in the peripheral and distant poultry farmers with respect to their knowledge about recommended broiler keeping practices. It might be due to the reason that brooding practices, equipment and spacing, diseases and parasites; and sanitation related knowledge of the peripheral poultry farmers might have been influenced by their proximal location to the poultry demonstration centres whose benefits perhaps would have not been drawn by the distant poultry

farmers. Moreover, other practices which requires mainly how to do knowledge have been found to be at par. These findings are in line with those of Parkash *et.al.* (2000), who reported that the poultry farmers had poor knowledge regarding disease management aspects.

It can be concluded on the basis of above findings that most of the poultry farmers had medium level of knowledge of recommended broiler keeping practices. This was followed by nearly 30 per cent of the respondents with low and 20 per cent of them with high level of knowledge. Out of ten aspects of broiler keeping selected for assessing their level of knowledge, the respondents were found possessing highest knowledge of the watering practices followed by chick procurement and litter management practices. Whereas, the respondents were found to possess least knowledge regarding temperature regulation practices. On an average there was more than 50 per cent knowledge gap regarding the scientific rearing and management of broilers. There had not been found any difference in the peripheral and distant poultry farmers with regards to their knowledge about broiler keeping practices. The findings of the study are of extreme help to the functionaries of state department of animal Husbandry, and other private agencies concerned with the transfer of technology relevant to poultry for expediting their efforts in this direction and increasing the output. Moreover, the agency concerned with training the poultry farmers may also get the help to develop the training modules for effective conduct of training based on the deficiency areas.

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Short Communication

Knowledge Level and Adoption of Production Technology of Wheat

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ABSTRACT

Wheat is one of the important cereal crops in the country. Since dates back, there is huge improvement in area, production and productivity of wheat. In U.P., even though the wheat average is high the productivity is still far behind the other wheat growing states. Keeping in view the immense scope of production of wheat, the level of knowledge and adoption was ascertained among the growers of wheat. The study was undertaken among the groups viz., resource rich and resource poor farmers. The study revealed that most of the resource rich and resource poor farmers did not possess good knowledge about common practices under wheat production technology. Very low level of adoption was found in case of method of sowing and rat control under both groups of farmers. Thus, the proper method should be transferred as and when required by farmers to boost up the production per unit area of wheat.

Keywords: Adoption, Knowledge, Production and Wheat

Wheat is the second most important staple food after rice in India. It derives more preference in the food consumption by large number of Indian people due to better nutritional value as compared to the rice and it also provides more than 50 per percent of calories to the people who mainly depend on it. Therefore, it will continue to be the major player in the Indian food sector. The total production of wheat is increased by more than six folds from nearly 12.3 million metric tons in 1965 to a record highest of 80.6 million metric tons in 2009. In India, it occupies a premier place among cereals, in terms of both area and production. India ranks second next to China amongst the wheat growing countries of the world. Wheat is one of the important cereal crops, occupies about 9.13 million hectare area with production of 24.25 million tons in U.P. The average productivity of wheat is 26.54 q/ha in the state, which is quite low as compared to other wheat growing states.

To increase the productivity of wheat, suitable technologies are being generated from time to time but only a few technologies are adopted by the farmers due to poor knowledge about improved practices. Knowledge is generally understood as an intimate acquaintance of an individual with facts. It is one of the

important prerequisites for the covert and overt behaviour of an individual. Therefore, it is utmost important to study the knowledge and adoption level of improved scientific production technologies among the farmers to in proper manner. Knowledge level should be brought about on a mass scale by education to million of farmers so as to enlighten them and bring home the potentialities of improved practices. This challenging task can be accomplished only through suitable and need based training programme of the farmers to increase their knowledge and skills in rational use of their locally available resource and adoption of improved practices for boosting up the wheat production.

The study was conducted in Aurai block of Sant Ravidas Nagar district of Uttar Pradesh, having major area under wheat cultivation. Major area under wheat production was identified from the block and five villages were randomly selected as Bejwan, Uchitpur, Bharatpur, Ugapur and Rauri. From each village 10 resource rich and 10 resource poor farmers were selected on the basis of stratified random sampling technique and data were collected personally with the help of pre-tested schedule. Thus, a total of 100 respondents were selected for interviewing and to

obtain the necessary information. In order to study the knowledge level regarding various practices of wheat cultivation, schedule was administered to the respondents. All the correct responses for the knowledge items were scored as 1, and incorrect responses were given '0' score. The following derivation was developed to measure the knowledge level of respondents.

$$\text{Knowledge index} = \frac{\text{Obtained knowledge score}}{\text{Obtainable knowledge score}} \times 100$$

Whereas, the adoption index was developed considering different items on 16 major wheat production practices. In addition, to test the significance of mean difference, paired t-test was also computed.

It is evident from the Table 1 that the highest level of knowledge was observed in method of sowing (65.00%) followed by knowledge of other practices in descending order viz. land preparation (61.15%), use of improved varieties (55.19%), time of sowing (54.57%), harvesting and threshing (52.52%), seed rate (52.00%), time of application of manure and fertilizer (51.22%), time of irrigation (50.73%), method of application of manure and fertilizer (50.11%), time of top-dressing of urea (49.70%), dose of manure and fertilizer (48.83%), intercultural operation (46.65%), use of weedicides (42.54%) and seed treatment (31.82%) among resource rich farmers. Very low extent of knowledge regarding wheat production technology was found in case of identification of diseases and their control (12.00%) and rat control (7.21%).

However, in the context of resource poor farmers regarding wheat production technologies, the highest extent of knowledge was observed in method of sowing 45.32 per cent followed by knowledge of other practices viz. land preparation (42.51%), seed rate (41.00%), time of application of manure and fertilizer (40.55%), time of irrigation (39.72%), use of varieties (39.42%), time of sowing (37.05%), harvesting and threshing (35.52%), time of top dressing of urea (33.12%), method of application of manure and fertilizer (32.72%), use of weedicides (32.58%) and seed treatment (20.52%), respectively. Very low extent of knowledge regarding wheat production technology was found in case of spacing (6.58%), identification of diseases and their control (5.50%) and rat control (1.00%), respectively. The overall extent of knowledge was computed as 44.39 in resource rich and 29.06 in resource poor farmers.

Table 1: Extent of knowledge of the respondents regarding to wheat production technology (N=100)

Practices	Extent of knowledge	
	Resource rich	Resource poor
Land preparation	61.15	42.51
Varieties	55.19	39.42
Seed rate	52.00	41.00
Seed treatment	31.82	20.52
Spacing	25.00	6.58
Time of sowing	54.57	37.05
Method of sowing	65.71	45.32
Dose of manure and fertilizers	48.83	11.80
Method of application of manure and fertilizers	50.11	32.72
Time of application of manure and fertilizers	51.22	40.55
Use of weedicides	42.54	32.58
Time of top dressing of urea	49.70	33.12
Time of irrigation	50.73	39.72
Identification of disease and their control	12.00	5.50
Rat control	7.21	1.00
Harvesting and threshing	52.52	35.52
Mean	44.39	29.06

S.E.=1.82, DF=15, t-value (cal)=8.42*, t-value (tab)=2.13

*Significant at 0.05 level of probability

Several researchers have revealed that knowledge is positively and significantly related to adoption of improved agricultural practices. In context of cultivation, farmer is the crucial element that can bring increased food production at rapid rate. The mean difference between resource rich and resource poor farmers were found highly significant at 0.05 level of probability. This also shows the extent of knowledge among the wheat producers owing to richness or poorness of resources.

The distribution of resource rich and resource poor farmers was categorized on the basis of their level of knowledge as low, medium and high. Maximum 69 per cent were categorized under medium level of knowledge followed by low (19%) and high (12%) in resource rich respondents. However, 54 per cent come under medium level of knowledge followed by 37 per cent under low category and 9 per cent under high category in resource poor respondents (Table 2).

The data given in Table 3 indicated that the highest level of adoption by the resource rich respondents were observed regarding the practices viz., time of sowing

Table 2: Distribution of resource rich and resource poor farmers according to their level of knowledge (N=100)

Categories	Percentage of farmers	
	Resource rich	Resource poor
Low (up to 29)	19.00	27.00
Medium (30-59)	69.00	54.00
High (> 60)	12.00	9.00
Total	100.00	100.00

Mean = 44.39, SD = 15.72

(50.35%), followed by seed rate (50.28%), varieties used (45.72%), time of top dressing of urea (45.45%), land preparation (43.61%), time of irrigation (42.84%), harvesting and threshing (41.25%), method of application of manure and fertilizer (39.78%), time of application of manure and fertilizer (35.72%), application of manure and fertilizer per hectare (29.77%), and use of weedicides (20.52%), respectively. Very low level of adoption was found in case of method of sowing (4.52%), and rat control (2.00%). However, the highest level of adoption was observed in seed rate (40.12%) specification followed by land preparation

Table 3: Extent of adoption of wheat production technology (N=100)

Practices	Extent of adoption	
	Resource rich	Resource poor
Land preparation	43.61	35.52
Varieties	45.72	29.42
Seed rate	50.28	40.12
Seed treatment	21.82	5.82
Spacing	10.72	4.33
Time of sowing	50.35	30.75
Method of sowing	4.52	2.45
Dose of manure and fertilizer	29.77	8.22
Method of application of manure and fertilizers	39.78	21.63
Time of application of manure and fertilizers	35.72	31.80
Use of weedicides	20.52	10.32
Time of top dressing of urea	45.75	30.25
Time of irrigation	42.84	30.37
Identification of disease and their control	8.25	3.33
Rat control	2.00	0.00
Harvesting and threshing	41.25	22.75
Mean	30.80	19.19

S.E.=1.48, DF=15, t-value (cal)=7.29*, t-value (tab)=2.13

*Significant at 0.05 level of probability

(35.52%), time of application of manure and fertilizer (31.80%), time of sowing (30.75%), time of irrigation (30.37%), time of top dressing of urea (30.25%), use of varieties (29.42%), harvesting and threshing (22.75%), method of application of manure and fertilizer (21.63%), respectively. Very low level of adoption was computed in dose of manures and fertilizer per hectare (8.22%), seed treatment (5.82%), spacing (4.33%), identification of diseases and their control (3.33%) and method of sowing (2.45%), respectively. None of the respondents were found using rat control measures in wheat crop. The overall level of adoption was computed as 30.80 in resource rich and 19.19 in resource poor farmers. As it can be seen from the results, the extent of adoption was higher in resource rich farmers due to higher level of knowledge in comparison to resource poor farmers. The t-value at 0.05 level of probability at 15 degree of freedom was 7.29 observed statistically significant. Similar with the level of knowledge, the level of adoption was also higher in resource rich farmers. When the scientific research in agriculture is moving fast and practically every month new practices, new seeds, new machinery and new perils to crops are coming to light, it is essential that the farmers are kept abreast of this dynamic agricultural practices by a systematic and planned way of education.

The data contained in Table 4 depicted the distribution of resource rich and resource poor farmers according to level of adoption and it was categorized under low, medium and high as studied earlier in knowledge level. Maximum number of respondents came under medium category (64 per cent in resource rich and 60 per cent in resource poor) followed by low category (29 per cent in resource rich and 35 per cent in resource poor) and high category (7% in resource rich and 5 per cent in resource poor farmers).

Table 4: Distribution of resource rich and resource poor farmers according to their level of adoption (N=100)

Categories	Percentage of farmers	
	Resource rich	Resource poor
Low (up to 14)	29.00	35.00
Medium (15-46)	64.00	60.00
High (> 47)	7.00	5.00
Total	100.00	100.00

(Mean = 30.80, SD = 16.49)

CONCLUSION

From the above discussion, it is enunciated that most of the resource rich and resource poor farmers did not possess good knowledge concerning to the common practices about wheat production more particularly in case of seed treatment, identification of diseases and their control and rat control. Thus, there is urgent need to enhance the good communication, training and extension system to make the farmers aware about latest innovations related in the locale. With this approach the knowledge of the both categories of the farmers can be improved. Very low level of adoption was found in case of method of sowing and rat control concerning to wheat crop by both categories of farmers therefore more emphasis should be given in this direction, so that these two most important package of practices may not

be ignored in future by both type of farmers. The study reflects that there is a lot of scope to boost up the production of wheat per unit area.

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Short Communication

Curiosity Scale for Innovative Farmers

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ABSTRACT

This study was conducted with the purpose to develop a curiosity scale for the innovative farmers. Curiosity is one of the most basic biological drives in human beings, and has also been identified as a key motive for learning and discovery. At grass-root level, a number of innovators are engaged in solving their day-to-day problems. Therefore, it is very interesting to know the nature of curiosity of such innovative farmers. Keeping this issue in mind, the scale was developed with the help of Likert's technique for measuring the level of curiosity of innovative farmers. Finally, the scale was consisting of twenty four statements.

Keywords: Curiosity, Scale, Reliability and Validity

One of the pioneers' work on human curiosity and relating it to variables such as complexity of stimuli and novelty, was conducted by Berlyne (1954). Beswick and Tallmadge (1971) reported that curiosity can be interpreted as an individual's drive and readiness to seek out and resolve conceptual conflict. For this study, the concept of 'curiosity' was operationalized as the tendency of an individual to react keenly to the novel, strange, odd, unusual, or mysterious things/objects existing in his/her surroundings by getting attracted toward them, observing, exploring, relating the things with their past experiences, gaining new experience and/or manipulating them. In the present study, an attempt has been made to develop a scale which can be empirically helpful in measuring the curiosity of the farmers. The tendency of searching knowledge varies from individual to individual as well as it varies with age also. There are several techniques available for scale construction, and amongst them, Likert's technique (1932) of summated rating scale was considered useful for this study, because it requires relatively less number of judges to start with and it is also less time-consuming. Thus, Likert's technique was followed for constructing the scale to measure the curiosity of farmers. The steps which were followed for the scale construction were as follows:

As a first step in developing the scale, a number of statements about the curiosity of dairy farmers from

various sources like books, bulletins, magazines, newspapers and discussions with subject matter specialist as well as innovative farmers were collected. A tentative list of 62 statements was drafted, keeping in view the applicability of statements suiting to the domain of interest.

The collected statements were edited in the light of informal criteria suggested by Thurstone and Chave (1929), Likert (1932), Bird (1940), Edwards and Kilpatrick (1948). In order to get a five point judgment, five alternative response categories ranging from 'strongly agree' to 'strongly disagree' were assigned to each statement. The collected statements were sent to 100 experts and responses from 60 experts were received. They were requested to add/delete or modify any statement which they deemed fit for inclusion or deletion. They were asked to check the statements for being favorable or unfavorable to measure the motivational factors involved in the development of innovation. Again the statements were re-written, according to criteria suggested by the afore-mentioned judges and their criticism and comments. After editing, 36 statements were selected.

To do so, the statements were first introduced to 40 progressive farmers of five villages namely Ratangarh, Dudla, Khurdi, Damala and Hafispur of Rador Block of Yamunanagar District of Haryana, other than those included in the case studies. The scoring

Table 1: Curiosity Statements Analysis and their critical ratio values

S.No.	Statements	Critical value ratio
1.	I enjoy collecting leaves/flowers/plants/other natural materials from the surroundings.	3.46*
2.	I like to read about plants/animals.	2.63*
3.	I am interested in “scientific know-how” about different traditions/cultures	2.33*
4.	I like to enrich/update my knowledge through various sources of information, like Radio, Television, Print Media, etc.	2.86*
5.	I like to observe different activities of insects/animals.	2.56*
6.	I like to observe cause and effect relationships among various things	1.31
7.	I am very much interested to know about the “mystery behind nature”	2.86*
8.	I try to understand deeper/inner aspects of new technologies.	3.00*
9.	It is fun to observe different species of plant available in the surroundings.	2.38*
10.	I am very much interested to use different combinations of feed-ingredients.	1.50
11.	I enjoy observing the activities of wild animals.	1.41
12.	I am very much interested to visit experimental farms.	2.10*
13.	I am interested to explore all the information about new technology introduced in the system.	3.00*
14.	I am very much interested to know the process of germination of different seeds in soil.	1.70
15.	I observe such weeds/unwanted varieties/other plants, which are having more vigorous yield than the actual crop.	1.41
16.	I like such stories, films and books which contain some elements of suspense.	2.89*
17.	I observe the variations among the things/species across the nature.	3.88*
18.	I observe the behavior and response of people.	3.20*
19.	I am very much interested to go to the depth of the things/explore the things.	4.70*
20.	I like discussions with older people about our culture/tradition.	1.50
21.	I like to do experiments with/on plants/animals.	2.01*
22.	I always try to use technologies for different purposes and am interested to know their results.	4.67*
23.	I like to visit new places and/or interact with unknown people.	2.10*
24.	I am never in hurry while taking/observing any information about any things.	2.41*
25.	I am very much interested to know about different preservatives, especially the techniques involved in it.	1.41
26.	I always try to get information regarding new technologies/innovations from different sources of communication.	1.86*
27.	I always search different Plants and/or plant materials, which are useful for curing different diseases of animals/human beings.	3.21*
28.	I enjoy attending the seminars/conferences/work shops/training programmes organized by different institutions.	1.96*
29.	I always want to know the factor affecting production as well as reproduction performances of animals.	1.00
30.	I always try to find the unique characteristics of living and/or non-living things as existing in my vicinity	2.28*
31.	I like to know the causes of different diseases of animals/human beings.	4.14*
32.	I like to search the possibilities of development of new products from milk/meat/fruits/grains/other agricultural products.	1.66
33.	I always search for various methods to do my job more effectively and efficiently.	1.46
34.	I like to search different methods in order to understand how to utilize the wastages.	1.26
35.	I like scientific and/or logical discussions on emerging problems in the social system for their appropriate solutions.	3.10*
36.	I am interested to understand the entire process behind treatment of various diseases affecting human-being and/or animals/livestock.	1.50

*Statement having critical ratio value more than 1.73 at 5 per cent level of probability and at 18 degree of freedom.

Table 2: Curiosity Scale for Innovative Farmers

S.No.	Statements	SA	A	UD	DA	SD
1	I like to do experiments with/on plants/animals.					
2	I am very much interested to go to the depth of the things/explore the things.					
3	I like to read about plants/animals.					
4	I like to enrich/update my knowledge through various sources of information, like Radio, Television, Print Media, etc.					
5	I try to understand deeper/inner aspects of new technologies.					
6	I am very much interested to visit experimental farms.					
7	I always try to use technologies for different purposes and I am interested to know their results.					
8	I always try to get information regarding new technologies/innovations from different sources of communication.					
9	I am interested to explore all the information about new technology introduced in the system.					
10	I enjoy attending the seminars/conferences/workshops/training programmes organized by different institutions.					
11	I enjoy collecting leaves/flowers/plants/other natural materials from the surroundings.					
12	I like to know the causes of different diseases of animals/human beings.					
13	I always search different Plants and/or plant materials, which are useful for curing different diseases of animals/human beings.					
14	I like to visit new places and/or interact with unknown people.					
15	I like scientific and/or logical discussions on emerging problems in the social system for their appropriate solutions.					
16	It is fun to observe different species of plant available in the surroundings.					
17	I observe the variations among the things/species across the nature.					
18	I observe the behavior and response of people.					
19	I like to observe different activities of insects/animals.					
20	I always try to find the unique characteristics of living and/or non-living things as existing in my vicinity.					
21	I am interested in “scientific know-how” about different traditions/cultures.					
22	I am very much interested to know about the “mystery behind nature”.					
23	I am never in hurry while taking/observing any information about any things.					
24	I like such stories, films and books which contain some elements of suspense.					

system of each statement was marked. The scoring system for each positive statement was 4 to 0 from ‘strongly agree’ to ‘strongly disagree’ and for each negative item was 0 to 4 from ‘strongly agree’ to ‘strongly disagree’ respectively. The score of each farmer on the scale was calculated by summing the weights of the individual item. According to Edwards (1957), 25 per cent (10) of the subjects with the highest total scores and also 25 percent (10) of the subjects with the lowest total scores were taken. For evaluating the responses of high and low groups to the individual statement, critical ratio value was worked out by using the formula given by Edwards (1957). Both positive and negative

statements were subjected to analysis and their critical ratio values are given in Table 1. The ‘t’ values of 24 statements out of 36 statements were significant (more than 1.73) at five per cent level of probability. So, finally, the scale consists of 24 statements, which are given in Table 2.

The reliability of curiosity scale was determined by applying test-retest method. The scale was administered twice to the same group consisting of thirty farmers (other than the actual respondents) at interval of 15 days. The agreement between scores was obtained from the two applications of the same scale administered by mean of correlation coefficient. The reliability

coefficient was 80. Since the content of the motivational scale was derived from authentic sources like books, journals, discussion with experts etc., it is assumed that the scores obtained by administering the curiosity scale of this study will measure what it intends to measure. The 't' value being significant for 24 statements, it is assumed that the scale is valid. For further checking validity of the scale, the statements of scale were sent to judges to evaluate whether statements are representative of the domain under study or not.

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