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Department of Extension Education
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Outside Surajpole, Udaipur-313001, Rajasthan, INDIA
Phone : 0294-2410491, Fax : 0294-2418976
e-mail : rseeudaipur@rediffmail.com

Indian Journal of Extension Education and Rural Development

FROM EDITOR'S DESK

We are happy that 25th volume (2017) of the Indian Journal of Extension Education and Rural Development is all set to go to print. In all, there are 39 research papers included in this volume covering variety of subject pertaining to agriculture and rural development.

This issue contains research papers on variety of subjects befitting to the contemporary times like food security and nutritional security, livelihood concerns, transfer of technology modes, information and communication technology, assessment of agricultural development programes like ATMA, RKVY, NFSM etc.

The editorial board is thankful to the contributors from across the country for sparing their valuable time and sharing their research work through the plateform of IJEE & RD. We expect the similar cooperation from the hon'ble members/contributors in coming years too.

We are grateful to Prof. P.N. Kalla, President and Prof. N.K. Punjabi, Secretory of the society for continous guidance and cooperation in bringing out this issue.

We are also thankful to the executive editor Prof. Ms. Dhriti Solanki and her team of editors for their untiring efforts in completing the task well in time.

Our special thanks are due to Professor F.L. Sharma, Dept. of Ext. Education without whose initiative and efforts the task would not have been converted to reality. Our thanks also goes to Dr.(Mrs.) Rajshree Upadhyay, Prof. and Head, Department of Extension Education & Communication Management, College of Home Science for their cooperation & help in this academic endeavour. Last but not the least Image Print Media deserves special appreciation for printing the Journal in time.

Warm regards.

S.K. Sharma
Chief Editor

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CONTENTS

Ind. J. Ext. Educ. & R.D. 25 : 2017

KNOWLEDGE AND ADOPTION OF POST HARVEST MANAGEMENT PRACTICES BY ONION GROWERS

P.B. Kharde*, S.D. Patil and S.S. Sadaphal*****

ABSTRACT

Agriculture occupies predominant place in Indian economy. Commercial crops like onion contribute to a great extent to the agricultural production. The present study was conducted in Khed tahsil of Pune district of Maharashtra where onion is extensively grown as a principle cash crop and onion bulbs are stored for longer period to get good market rates. Ten villages with 120 respondent farmers were selected by proportionate sampling method. The study was undertaken with the objectives to study the extent of knowledge and adoption of post harvest management practices of onion by onion growers, constraints faced and obtaining their suggestions. With regards to the knowledge of respondents after harvesting of onion, majority had knowledge regarding storage of onion in shade and drying of onion in farm along with leaves, storage of onion in shade and grading of onion according to size (67.50 %). But less than half (47.50 %) of the respondents had knowledge on cutting of onion bulb by keeping neck height 3 to 5 cm. As regards to adoption, it was observed that a large majority i.e. 91.60 per cent respondents harvested the onion after 50.00 per cent neck fall, 86.67 per cent respondents followed the drying of onion in farm along with leaves and adopted the proper storage of onion in shade (83.33 %). Half of the respondents (50.00 %) graded the onion according to size, while, only 45 per cent had followed the practice of cutting of onion bulb by keeping neck height 3-5 cm to onion. The major constraint reported by the respondents were high fluctuation in rates of onion in market (75.00 %), while, 91.67 per cent respondents suggested that the rates of onion be fixed by the government. The study implies that the adoption gap among the onion growers needs to be focused by extension agencies for awareness through mass media and field visits. Thus, higher adoption of these crucial aspects of post harvest management practices in onion is very much essential.

INTRODUCTION

Onion (Allium cepa L.) is grown on large area in India for local consumption and export purpose. India is the second largest producer of onion in the world. The area under onion crop in India was 117.34 lakh ha and production was 189.27 lakh tones in the year 2015-16. In India the crop is cultivated all over the country particularly in the states of Maharashtra, Gujarat, Orissa, Karnataka, Tamilnadu and Uttar Pradesh.

Maharashtra has pivotal and predominant position in the country in respect of area (4.41 lakh ha) and production (53.61 lakh tones). The average productivity of onion in Maharashtra was 12.10 t/ha in 2015-16. In recent years onion has gained importance as a cash crop rather than vegetable crop because of its large export every year. The major onion growing districts in Maharashtra are Nasik, Ahmednagar, Pune and Satara. The area under onion in Pune district is about 60000 ha with production of 9.6 lakh tones. In Pune district, the Khed tahsil covers an area of 7000 ha under onion with production of 1.12 lakh tones (Anonymous, 2016).

Onion being of semi-perishable nature i.e. low storage life, its marketing and storage has great significance for obtaining higher net returns. The tremendous fluctuation in prices of onion in market are due to varying production level of onion, its semi-perishable nature, export-import policy of government etc. Storage of farm produce is very important in agriculture. Onion is grown in all the three seasons viz., kharif, rabi and summer depending upon the availability of irrigation facilities. The bulk of the onion is produced in the winter season which arrives in the market during April-May. However, the consumption of onion is spread throughout the year and there is steady demand for onion bulbs all the year round. The bulb of the produce is, therefore,

*Professor, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, e-mail:pbkharde@gmail.com.
**Assistant Professor, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra.
***Junior Research Assistant, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra.

stored for period of 4-6 months so as to meet the internal demand and export markets.

Generally, the onion growers bring their produce in market for sale immediately after its harvest because of the lack of adequate storage facilities and financial problems of the onion growers. This results in glut of onion in market and thereby fall in market prices of the onion. Sometimes, the market rates reach such a low stage that it is very difficult for the onion growers even to meet the transportation charges. In order to avoid such situations onion growers need to be made aware of the post harvest management practices so that they can store their produce for longer time to fetch fair market price and to get good income. Hence, the study was undertaken with the objectives to study the knowledge and adoption of recommended post harvest management practices of onion by the respondents, to delineate the constraints faced by onion growers and to obtain the suggestions of onion growers.

RESEARCH METHODOLOGY

The present study was conducted in Khed tahsil of Pune district. The list of the onion grower farmers in Khed tahsil was obtained from Taluka Agricultural Officer of Khed tahsil. From each village, 12 farmers were selected randomly. From these 10 villages, 120 respondents were selected by proportionate sampling method. The interview schedule was prepared in simple language in order to get appropriate and accurate information. The data was collected by interviewing respondents by the researcher. The information collected through interview was transferred to the primary tables and then to the secondary tables. In this way the collected information was analyzed and tabulated. The collected data was compiled and subjected to appropriate statistical analysis.

RESULTS AND DISCUSSION

The results of the present investigation are presented here under in the line with the objectives set forth.

Knowledge of post harvest management practices followed by onion growers : The information pertaining to the practicewise knowledge of post harvest management practices followed by onion growers is presented in Table 1.

Table 1. Distribution of onion growers by their knowledge about post harvest management practices

Sr.	Five point programme (after harvesting)	Frequency (N=120)	%
1.	Harvesting of onion after 50.00 per cent neck fall	120	100.00
2.	Drying of onion in farm along with leaves	120	100.00
3.	Storage of onion in shade	100	83.33
4.	Grading of onion according to size	81	67.50
5.	Cutting of onion bulb by keeping neck height 3-5 cm to onion	57	47.50

With regards to the knowledge of respondents after harvesting of onion, cent percent had knowledge regarding storage of onion in shade and drying of onion in farm along with leaves. Majority (83.33 %) of them had knowledge regarding storage of onion in shade and grading of onion according to size (67.50 %). But less than half (47.50 %) of the respondents had knowledge on cutting of onion bulb by keeping neck height 3 to 5 cm. Thus, it can be concluded that onion growers were well acquainted with the post harvest management practices of onion. These findings are in line with Jadhav (2009) and Waykar (2013).

Table 2. Distribution of onion growers by their adoption of post harvest management practices

Sr.	Five point programme (after harvesting)	Frequency (N=120)	%
1.	Harvesting of onion after 50.00 per cent neck fall	110	91.60
2.	Drying of onion in farm along with leaves	104	86.67
3.	Storage of onion in shade	100	83.33
4.	Grading of onion according to size	60	50.00
5.	Cutting of onion bulb by keeping neck height 3-5 cm to onion	54	45.00

Adoption of post harvest management practices by onion growers : The data regarding adoption of post harvest management practices by onion growers is presented in Table 2.

With regards to the adoption of respondents regarding post harvest management practices, it was observed that a large majority i.e. 91.60 per cent respondents harvested the onion after 50.00 per cent neck fall, 86.67 per cent respondents followed the drying of onion in farm along with leaves and adopted the proper storage of onion in shade (83.33 %). Half of the respondents (50.00 %) graded the onion according to size, while, only 45 per cent had followed the practice of cutting of onion bulb by keeping neck height 3-5 cm to onion. These findings are similar in line with Koli (2003) and Waykar (2013).

Storage methods used by onion growers : The data on storage methods used by onion growers is presented in Table 3.

Table 3. Distribution of onion growers by their use of storage methods

Sr. No.	Storage method	Frequency (N=120)	%
1.	Wooden chawl/iron chawl	73	60.83
2.	Bamboo chawl	38	31.67
3.	Stone chawl	05	4.17
4.	Round iron net	04	3.33
	Total	120	100.00

The data indicated that more than half (60.83 %) of the onion growers had used wooden chawl/ iron chawl recommended by MPKV, Rahuri followed by 31.67 per cent constructed their own bamboo chawl. Furthermore, a very negligible (4.17 % and 3.33 %) had stored onion in stone chawl and round iron net chawl, respectively.

Constraints faced by onion growers : Constraints refer to the circumstances or causes, which prohibit farmers in adopting farm technology. The information collected on these points has been compiled in the Table 4.

The major constraints reported by the respondents were high fluctuation in rates of onion in market (75.00 %), high cost of micro-irrigation system (69.16 %), unavailability of grading machines (62.50 %), unavailability of skilled labour for harvesting of onion (55.83 %), lack of knowledge about handling/care of onion during storage period (52.50 %) and improved storage facilities are costly (47.50 %). These findings are conformity with findings of Maghade (2007) and Kadam (2008).

Table 4. Constraints faced by onion growers

Sr.	Constraints	Frequency (N=120)	%
1.	High fluctuation in rates of onion in market	90	75.00
2.	High cost of micro-irrigation system	83	69.16
3.	Unavailability of grading machines	75	62.50
4.	Unavailability of skilled labour for harvesting of onion	67	55.83
5.	Lack of knowledge about handling/ care of onion during storage period	63	52.50
6.	Improved storage facilities are costly	57	47.50

Suggestions of the onion growers : The suggestions made by onion growers are presented in Table 5.

Table 5. Suggestions of the onion growers

Sr.	Suggestions	Frequency (N=120)	%
1.	The rates of onion be fixed by the Government	110	91.67
2.	Subsidies on micro-irrigation system should be increased	73	60.83
3.	Efficient and suitable transportation facilities	62	51.66
4.	Grading machines should be made available to onion growers by Panchayat Samiti, Agril. Dept. at subsidized rate	51	42.50

These suggestions were regarding the rates of onion be fixed by the government (91.67 %), subsidies on micro-irrigation system should be increased (60.83

%), efficient and suitable transport facilities for onion (51.66 %) and grading machines should be available to onion growers by Panchayat Samiti, Agril. Department at subsidized rate (42.50 %). Similar findings were reported by Shete (2008), Wankhede (2008) and Jadhav (2009).

CONCLUSSION

The study pointed a gap in adoption of some of the post harvest management practices of onion by the respondents. This includes the important practices like cutting of onion bulb by keeping neck height 3-5 cm to onion and grading of onion as per size. This adoption gap among the onion growers needs to be focused by extension agencies for awareness through mass media and field visits. Thus, higher adoption of these crucial aspects of post harvest management practices in onion is very much essential. Further, the results of the study have pointed out that still onion growers go for non recommended storage structures for storing onion. This results in post harvest storage losses of onion. Thus, the concerned department needs to provide sufficient credit for constructing improved storage structures of onion at reasonable rates. The onion growers should be provided grading machines and method demonstration should be conducted for them to equip them with skill of its working.

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IMPACT OF FRONT LINE DEMONSTRATIONS ON THE YIELD AND ECONOMICS OF BLACK GRAM IN BURHANPUR DISTRICT OF MADHYA PRADESH

Jagannath Pathak*

ABSTRACT

Pulses productivity in India is very low.It may be due to several biotic and abiotic factors. But, the main reason behind this seems to be the technological gap in adoption of pulse production technologies. In such a situation, front line demonstration (FLDs) play a vital role in boosting up the pulse production at farmers' fields, under the close supervision of KVK's scientists. Thus, Krishi Vigyan Kendra Burhanpur conducted FLDs on black gram (JU-86) during 2010-11 to 2013-14 at farmers' fields in three sample villages (*Dhoolkot*, *Harda*, and *Biroda*) of the district Burhanpur. So, the total number of demonstrations conducted during the said period was 48. Data focused that the highest average yield (6.77 qtl. ha^{-1}) out of four years was obtained during 2013-14 with its overall average yield 6.37 qtl. ha^{-1}, while on farmers' field it was found out 4.59 qtl. ha^{-1} only. Hence, the percent increase in yield of FLDs was 38.77 % over farmers' fields practice. The average yield gap and yield index of 3.62 qtl. ha^{-1} and 36.27 %, respectively were obtained under study. The net return (Rs.11956), VCR (1.28: 0.88) and B: Cratio (2.23:1.84) was also found higher in FLDs as compared to farmers' fields practice.

INTRODUCTION

India is the largest producer, importer and consumer of pulses in world, but over the past three decades, the area, production and productivity of pulses have been swinging between 23-25 million hectares, 15-19 million tones and 700-790 kg ha^{-1} respectively. Although, there is slight increase in pulses productivity in recent times, but it is still quite below the world's average productivity (840 kg ha^{-1}). On the other hand, India has 25 per cent production with 32 per cent area of the world. In India, the importance of pulses as a source of dietary protein can hardly be over emphasized. The common man's food implies dal and roti.There are many legumes traditionally used as dal and many of them now being utilized as vegetables.The per capita per day net availability of pulses is still low in India, ranging from 42-47 gram. It is almost stagnating with slight increase in recent years.

Pulses occupy a prominent place in human nutrition particularly among the lower - income groups of people in developing countries like India. Important pulses grown in India are chick pea (bengal gram), pigeon pea (red gram), lentil (masoor), urd bean (black gram), moong bean (green gram), moth bean, pea, grass pea (khesari), cow pea (lobia) and broad bean (fababean). These grains are relatively inexpensive source of protein in developing countries where protein energy malnutrition is quite common. The protein content in pulse grains generally ranges from 20-25 per cent. Besides protein, pulses are also a good source of dietary fibre, starch, minerals and vitamins. Legumes typically low in fat, contain no cholesterol, and are high in folate, potassium, iron and magnesium.

Legumes are important component of crop rotations. They require less fertilizer than other crops and are a low carbon source of protein. Legumes are part of the rotational cropswhom, farmers use to maintain soil fertility. They have a direct positive impact on soil quality because they help feed soil microbes that benefitto soil health. They have also shown greater production and different types of amino acids than non legumes and the plant residues left after harvesting.Pulse crops have a different bio-chemical composition than other crop residues. By fixing nitrogen in the soil, pulses also help to reduce the footprint of other crops so; the benefits extend

*Soil Scientist: ICAR-AICRP (MSPE), Department of Botany, Lucknow University, Lucknow, 226007 (UP)

much further into the food production cycle.

Lower pulse production is due to several biotic and a-biotic stresses besides, unavailability of quality seeds of improved varieties on time and poor crop management due to unawareness and no adoption of recommended production technologies. Seed is the nucleus of any production programme. The efficiency of applied inputs as well as natural environment is decided by genetic potentiality of seeds. But seed replacement of pulses is below 5 per cent against desired level of 15-25 percent. Keeping in view the importance of pulses, there is an urgent need to demonstrate the high yielding varieties and other pulse production technologies that can accelerate the pulse production. So, the Krishi Vigyan Kendra, Burhanpur conducted FLDs on blackgram at farmers' fields under rainfed situations in kharif seasons during the year 2010-11 to 2013-14.

RESEARCH METHODOLOGY

Study was carried out under rainfed condition and 48 demonstrations were conducted in its adopted villages *viz*. Dhoolkot, Harda, and Biroda of district Burhanpur of MP in kharif season of 2010, 2011, 2012 and 2013, respectivelyon the selected farmers' fields. Each demo was conducted in 0.4 ha (1 acre) and thus, 12 demonstrations were conducted every year. For the adoption of village, PRA techniques and for the selection of farmers, the purposive sampling from frequently organized group meetings was exercised in each village. Before conducting FLDs, a list of sample farmers was prepared. The specific package of practices (POP) of crop oriented training to be imparted to the selected farmers was enlisted (Venkattakumar *et al*., 2010). During meeting, receptive and innovative farmers were selected for technological intervention. Improved technology released from JNKVV Jabalpur was adopted, which comprised of soil test based fertilizers tailoring (20:60:20 kg NPK ha^{-1}) + seed treatment with mixture of carboxine & thiram @ 2gm kg^{-1} seed, followed by Bradyrhizobium japonicum and PSB culture @ 5gm kg^{-1} seed , soils were treated with Trichoderma viridie culture @ 10 kg ha^{-1} + use of disease resistant variety (JU-86). Seed @20 kg ha^{-1} was applied and sowing was done after first shower of rain in the last week of June to first week of July when the soil was moist up to 6 cm deep. Sowing was done using bullock drawn tifan (local mechanization) at 45 cm row to row distance and harvested in between last week of September to first week of October. Pesticides were used as and when required and timely weed management was fallowed up.

In general, soils of the area under study were medium black cotton soils with low to medium fertility status.

The performance of demonstrated technology was compared with farmers' fields practice in the same villages. Farmers practice included imbalance use of fertilizers i.e. 9, 23, 0 kg NPK ha^{-1},higher seed rate (25-30 kg ha^{-1}), soil treatment, seed treatment and bio inoculation of seed were not in practice and indiscriminate use of pesticides.The differences in demonstrated technology and existing farmers' practices (local check) are mentioned in Table 1.

To study the yield attributes, 25 plants were selected by randomly placing of quadrate at five places in FLDs plots as well as in farmers' practices plots and five plants selected from each quadrate. Yield data from FLDs and farmers' practices were collected after harvesting the crop. For the economical assessment such as gross return, net returns, benefit cost ratio and value cost ratio (VCR), the prevailing markets rates of input, labour and produce were utilized. Data were collected from both FLDs as well as farmers' fields practice plots and analyzed for the yield gap, yield index (Samui *et al*., 2003).

RESULTS AND DISCUSSION

Gaps between the farmers' practices and recommended technologies of black gram in district Burhanpur is presented in Table 1. Full gap was observed in case of variety, seed treatment and plant protection measures and technological gap was also found in seed rate and fertilizer doses i.e. not as per recommendation. These gaps reduced productivity of black gram in the district.

Farmers were not aware about recommended technologies they were using unidentified varieties instead of high yielding varieties because of unavailability of improved varieties seeds. Due to lack of knowledge about the importance of seed

Table 1: Differences between FLDs and farmers' practices on blackgram

Particulars	Technological Intervention	Farmers'Practices	Gap (%)
Variety	JU-86	Unidentified variety	Full gap (100%)
Seed rate	20 kgha^{-1}	25-30 kgha^{-1}	Higher (More than recommended)
Seed treatment	Carboxine + Thirum mixture @ 2gm kg^{-1} seed	Not in practiced	Full gap (100%)
Method of sowing	Line sowing	Line sowing	No gap
Fertilizer dose	20:60:20 kg NPK ha^{-1}	9, 23, 0 kg NPK ha^{-1}	(Not as per recommendation)
Weed management	Manual weeding	Manual weeding	No gap
Irrigation	Rainfed	Rainfed	No gap
Plant Protection Measures	Applied acetamaprid @ 8 gm per15 liter of water for the control of sucking insect.	No control	Full gap (100%)

Table 2: Gap in grain yield and economics of black gram JU-86

Year	Average Yield (qtlha-1)		Percent Increase	Yield Gap qtlha^{-1}	Yield Index (%)	Net Return		B:C ratio		Value Cost Ratio (VCR)	
	FLDs	FP				FLDs	FP	FLDs	FP	FLDs	FP
1	2	3	4	5	6	7	8	9	10	11	12
2010-11	5.98	4.31	38.74	4.02	40.2	10570	5962	2.08	1.68	1.23	0.81
2011-12	6.21	4.49	38.30	3.79	37.9	11560	6619	2.24	1.82	1.18	0.76
2012-13	6.53	4.84	34.91	3.47	34.7	12440	7764	2.27	1.89	1.33	0.93
2013-14	6.77	5.1	32.74	3.23	32.3	13256	8648	2.35	1.99	1.41	1.04
	6.37	4.59	38.77	3.62	36.27	11956	7248	2.23	1.84	1.28	0.88

FP: Farmers' fieldpractice, FLDs: Front line demonstration

treatment and plant protection measures, farmers were not adopting these technologies.Consequently, negative effect on yield of crops was observed under farmers' practices.

Yield:

Data presented in Table 2 revealed that, average yield was recorded 6.37 qtlha^{-1} under FLDs as compared to farmers' field practice 4.59 qtl ha^{-1}. The highest average yield out of four years (6.77qtl ha^{-1} on FLDs) and (5.1qtl ha^{-1} on FPPs) were obtained during 2013-14. These results clearly indicated the higher average yields under demonstrative over the years as compared to farmers' field practice. Similar results have also been reported by Mishra *et al*. (2008), Narasimharao *et al*. (2007) and Tiwari *et al*. (2003).

Percent yield increased over farmers' fields practice was found 38.77 per cent. Yield under farmers' fields practice is showing an increasing trend, reflecting the impact of FLDs on farmers' practice. The above findings are in close conformity with the findings of Singh (2002).

Yield gap:

The yield gap between potential yield and yield of FLD plots was 4.02, 3.79, 3.47 and 3.23qtlha^{-1} during 2010-11, 2011-12, 2012-13 and 2013-14, respectively. On an average yield gap in four year FLDs was 3.62 qtlha^{-1}. The yield gap observed may be due to several biotic and abiotic factors. These results are in close conformity with the findings of Mitra & Samajdar (2010) and Sashidharan *et al*. (2007).

Yield Index:

The yield index shows the feasibility of the demonstrated technology at the farmers' fields. The yield index varied from 32.3-40.2 per cent. Four year

average yield index was found 36.27 per cent which shows the efficacy of good performance of technical interventions. This will accelerate the adoption of demonstrated technical intervention to increase the yield performance of blackgram. Similar results have also been reported by Vaghasia *et al*., 2005 and Kumari *et al.,* 2007.

Economic Return:

The input and output prices of commodities prevailed during the study of demonstration were taken for calculation of net return B: C ratio and VCR. Always higher net return, B: C ratio and VCR was found under demonstration (Table 2) due to higher yield obtained under FLDs as compared to farmers'fields practices. These results are in agreement with those of Mokidue *et al*. (2011) and Kirar *et al*. (2006) and Deshmukh *et al*. (2005).

CONCLUSION

Front line demonstration is the way to demonstrate the latest developed technologies at the farmers' fields and generate the yield data and feed back information for future research programme. Increasing yield trend under farmers' fields practiceand decreasing trend of technology index shows the impact of demonstrated technology on blackgram cultivation in the district - Burhanpur.

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IMPACT OF LIVELIHOOD AND NUTRITIONAL SECURITY PROJECT ON SOCIO-ECONOMIC STATUS OF RURAL HOUSEHOLDS IN UDAIPUR DISTRICT OF RAJASTHAN

G.L. Meena*, B. Upadhyay and Hari Singh*****

ABSTRACT

The present investigation was carried out to study the impact of Livelihood and Nutritional Security Project on households with special focus on the socio-economic status, income and employment of rural households in Udaipur district of Rajasthan. Results of the study indicated that all the domestic, farm, transportation assets, productive animals and quality life indicators were observed higher on beneficiary households than that of non-beneficiary ones. Beneficiary households over non-beneficiary households observed highest increase in television & DVD player (90%), domestic assets, seed drill & thresher (200%), farm assets, motor-cycle and four wheelers (12.50%), transportation assets, poultry (418.18%) and livestock animals. Further, beneficiary households had higher percentage of quality of life indicators as compared to non-beneficiary households. Overall income per household per annum of beneficiary households (Rs. 37844.45) was more than non-beneficiary households (Rs. 21695.56). Overall income per household per annum was increased by 74.43 per cent. The overall employment (per household per annum) of beneficiary households (194.42 man days) was relatively more than non-beneficiary households (148.86 man days). Overall employment in terms of man days was increased by 30.60 per cent in case of beneficiary households. It was further observed that men and women participation was higher in the beneficiary households as compared to non-beneficiaries while, children's participation was marginally higher in non-beneficiary households than that of beneficiary ones.

INTRODUCTION

Presently, the ICAR-NAIP project on "Livelihood and Nutritional Security of Tribal Dominated Areas through Integrated Farming System and Technology Models" under the aegis of Maharana Pratap University of Agriculture & Technology, Udaipur is going on. The aim of the project is successful development of Integrated Farming System (IFS) modules in the tribal dominated area which are site specific considering different agro-climate situations. Research activities on two modules (Horticulture based IFS and Livestock based IFS) were tried for accelerating livelihood security for horizontal expansion and spread. A large number of horticultural and livestock based technologies have been made available to the farmers through this project. These modules of Integrated Farming System with judicious mix of proven technologies have been recognized as a vital tool for bringing social upliftment. As on April, 2013, the project has completed 6 years and still going on. Very few efforts so far have been made to evaluate its progress during its execution so as to know its strengths and weakness in the light of socio-economic outcomes. The present study was carried out in Udaipur district of Rajasthan with the objective to determine the socio-economic status among the farmers as a result of the project. The results of the study area are of great importance to the stakeholders (researchers, planners, executives, government officials and farmers) for modification, improvement and strengthening of the project, as it has to go a long way in the study area.

RESEARCH METHODOLOGY

The consortia project had been implemented by MPUAT, in Udaipur, Dungarpur, Banswara and Sirohi districts of Rajasthan. Out of all operational districts, Udaipur district was purposively selected for the present study. One cluster i.e. Mavli-I, out of four clusters, was selected from Udaipur district on the basis of maximum number of villages covered under the project. The present study was confined to six villages only consisting of *Rathana*, *Bansliya* and

*Assistant Professors, Department of Agricultural Economics and Management, RCA, Udaipur (Rajasthan).
**Professor, Department of Statistics and Computer Application, RCA, Udaipur (Rajasthan).
***Assistant Professors, Department of Agricultural Economics and Management, RCA, Udaipur (Rajasthan).

Rediya khedi villages as beneficiary villages and *Khimakheda*, *Ganvda* and *Varni* villages as non-beneficiary villages. From six selected villages, 45 beneficiary households and an equal number of non-beneficiary households (45) of almost similar resource situation were selected from the nearby villages to serve as valid basis of comparison. Thus, a total of 90 households were randomly selected for the present study. The study was based on a sample survey conducted for the year 2013-14. The primary data on domestic assets, farm assets, livestock assets, life indicators, transportation assets, income and employment were collected from selected households on suitably structured schedules. Different economic parameters of households were studied with the help of tabular analysis. The significance of difference between the mean value of income and employment of beneficiary and non-beneficiary households was tested by using Z-test.

RESULTS AND DISCUSSION

The socio-economic profile of sample households has profound massive influence on the decision-making process and profitability of the enterprises. An attempt has been made in this section to document the important socio-economic characteristics of the respondent households. The impact of project was examined on various socio-economic aspects such as domestic assets, transportation assets, farm assets, quality of life indicators, herd size, income and employment of the sample households.

Domestic assets: Analysis of domestic assets possessed by beneficiary and non-beneficiary households has been presented in Table 1.

It can be observed from Table 1 that all the domestic assets were reported to have slightly more number in case of beneficiary households compared to non-beneficiary ones. The highest increase in case of beneficiary households was observed in television & DVD player (90%) followed by sewing machine (51.61%), bed (38.46%), mobile (16.28%), gas stove (12.50%), fan (12.50%), chairs/table (11.83%) and radio (11.54%). Further, study revealed that the non-beneficiary households did not have any smokeless chulha. On an average, 0.09 number of smokeless chulha were possessed by beneficiary households. Beneficiary households had higher domestic assets compared to non-beneficiary ones. The observation made in the present study as in conformity with the finding of Rumi and Rana (2002).

Table 1: Domestic assets possessed by beneficiary and non-beneficiary households

(Number/household)

Types of Asset	Beneficiary	Non-beneficiary	Change
Gas stove	0.18	0.16	0.02 (12.50)
Radio	0.29	0.26	0.03 (11.54)
Television & DVD player	0.38	0.20	0.18 (90.00)
Fan	0.90	0.80	0.10 (12.50)
Mobile	1.50	1.29	0.21 (16.28)
Bed	0.18	0.13	0.05 (38.46)
Chairs/table	1.89	1.69	0.20 (11.83)
Sewing machine	0.47	0.31	0.16 (51.61)
Smokeless chulaa	0.09	-	0.09 (+)

Figures in parentheses indicate percentage increase in domestic assets position of beneficiary over non-beneficiary. + Mathematically infinity implying a very large increase.

Farm assets: The analysis of farm assets possessed by beneficiary and non-beneficiary households has been presented in Table 2.

Table 2: Farm assets possessed by selected households

(Number/household)

Types of Asset	Beneficiary	Non-beneficiary	Change
Wheel hoe	0.37	0.31	0.06 (19.35)
Sickle	1.02	0.93	0.09 (9.68)
Seed drill and Thresher	0.06	0.02	0.04 (200.00)
Chaff cutter	0.29	0.20	0.09 (45.00)
Spades/shovel	0.95	0.93	0.20 (2.15)
Ploughs	0.69	0.4	0.29 (72.50)
Sprayer/duster	0.34	0.31	0.03 (9.68)
Storage bin	0.53	0.49	0.04 (8.16)

Figures in parentheses indicate percentage increase in farm assets of beneficiary over non-beneficiary.

Table 2 indicates that the farm assets were reported to have increased in case of beneficiary households over non-beneficiary ones. The highest increase was observed in case of seed drill & thresher (200%) followed by plough (72.50%), chaff cutter (45%), wheel hoe (19.35%), sprayer/duster (9.68%), sickle (9.68%), storage bin (8.16%) and spades/shovel (2.15%). Beneficiary households gained remarkable increase in seed drill & thresher and lowest in spades / shovel. Overall beneficiary households had higher farm assets than the non-beneficiary ones. These findings are in support with the results of Mian (2007) and Nemade & Mahalle (2010). Thus, it can be concluded that project had a positive impact on farm assets.

Transportation assets: The analysis of transportation assets possessed by beneficiary and non-beneficiary households has been presented in Table 3.

Table 3: Transportation assets possessed by households

(Number/household)

Types of Asset	Beneficiary	Non-beneficiary	Change
Bi-cycle	0.29	0.33	- 0.04 (-13.79)
Motor-cycle	0.18	0.16	0.02 (12.50)
Bullock cart	0.07	0.10	- 0.03 (-42.85)
Four-wheelers (Car/tractor/Truck)	0.18	0.16	0.02 (12.50)

Figures in parentheses indicate percentage increase in transportation assets of beneficiary over non-beneficiary.

The transportation assets were reported to have increased or decreased on beneficiary households over non-beneficiary ones. The 12.50 per cent increase was observed in case of motor-cycle and four wheelers in case of beneficiary households while the decrease was observed by 42.85 per cent and 13.79 per cent in case of bullock carts and bi-cycle, respectively, in beneficiary households. Present study clearly indicated that beneficiary households shifted from bi-cycle and bullock carts to motor-cycle and four-wheelers. This might be due to increase in income of beneficiary household. The increase in motor cycle and four wheelers on beneficiary households was also observed by Kumar and Dhawan (1992) and Mian et al. (2007). Thus, it can be concluded that project had a positive impact on transportation assets.

Quality of life indicators: The quality of life indicators were analysed and presented in Table 4.

Table 4 reveals that beneficiary households had higher percentages of quality of life indicator as compared to non-beneficiary ones. In the study area, the average percentage of households who have quality life indicator such as presence of electricity, piped water, toilets, pucca buildings, tube-wells, alteration and repair of dwelling house and wells was observed as 51.11 and 33.33, 11.11 and 6.67, 15.56 and 11.11, 37.78 and 31.11, 6.67 and 4.44, 31.11 and 13.33, 20 and 15.57 per cent, in case of beneficiary and non-beneficiary households respectively. The beneficiary households enjoy more quality life than non-beneficiary households. The observations made in the present study are in conformity with the findings of Liaquath (1990) and Mian et al. (2007). Thus, it can be concluded that project had a positive impact on quality of life indicators.

Table 4: Quality of life indicators of households

(Percentage of households)

Types of Indicator	Beneficiary	Non-beneficiary
Electricity connections	51.11	33.33
Piped water	11.11	6.67
Toilets	15.56	11.11
Pucca buildings	37.78	31.11
Tube-wells	6.67	4.44
Alteration and repair of dwelling house	31.11	13.33
Wells	20.00	15.57

Herd size: The herd strength and the number of milch animals in the household directly affect the economy of the households. Different types of animals were maintained in selected households. The average number of livestock animals possessed by beneficiary and non-beneficiary households are presented in Table 5.

Table 5: Average number of livestock animals possessed by households

Types of Animals	Beneficiary	Non-beneficiary	Change
Buffalo	2.00	1.60	0.40 (25.00)
Cow	1.86	2.64	- 0.78 (-41.94)
Draught animals	0.24	0.42	- 0.18 (-75.00)
Goat	1.69	0.73	0.96 (131.51)
Sheep	0.11	0.08	0.03 (37.50)
Poultry	1.71	0.33	1.38 (418.18)

Figures in parentheses indicate percentages increase in livestock animals of beneficiary over non-beneficiary.

It can be observed from Table 5 that the animals were reported to have increase or decrease on beneficiary households over non-beneficiary ones. The notable increase was observed in case of poultry (418.18%) followed by goat (131.51%), sheep (37.50%) and Buffalo (25%) while the decrease was observed in case of draught animals by 75 per cent and in cow by 41.94 per cent on beneficiary households compared to non-beneficiary ones. The reduction was observed in draught animals in case of beneficiary households might be due to the adoption of farm mechanization. On an average, numbers of productive animals were slightly higher in beneficiary households than that of non-beneficiary households, which implied that beneficiary households were having marginally better livestock resource base. Thakur *et al.* (2000) also found better livestock resource with beneficiaries after implementation of irrigation project. Thus, it can be concluded that project had a positive impact on strength of livestock animals.

Income and Employment: The economic gains accruing to beneficiary households from adoption of IFS horticulture and livestock technologies can be realized in terms of increased level of income and employment of the producer-farmers. The results of the same have been presented in Table 6.

A close examination of Table 6 revealed that the overall income per household per annum was to the tune of Rs. 37844.45 for the beneficiary household which was relatively more than Rs. 21695.56 for the non-beneficiary households. Relatively higher income observed in member group as compared to non-member group is in conformity with the findings of Kumar and Sharma (1999), Kumar and Singh (2001), Singh and Sharma (2006) and Meena et al (2009). Overall income per household per annum was increased by 74.43 per cent in case of beneficiary households. Further, per cent share in total income was highest from field crops (75.28%) followed by vegetables (15.74%) and livestock (8.98%) in beneficiary households while it was also highest from field crops (85.53%) followed by livestock (14.47%) in case of non-beneficiary households.

The overall employment generated per household per annum was 194.42 man days for the beneficiaries which was relatively more than 148.86 man days for the non-beneficiary households. Relatively higher employment observed in member group as compared to non-member group was in conformity with the findings of Sharma and Singh (1995), Shukla (1995), Kumar and Sharma (1999), Kumar and Singh (2001) and Meena et al (2009). Overall employment in terms of man days was increased by 30.60 per cent in case of beneficiary households.

On an average men, women and child labour per household in the case of beneficiary households was 117.33, 48.53 and 28.56 man days, respectively, accounting for about 60.35, 24.96 and 14.69 per cent of the total labour use. However, in case of non-beneficiary households, the corresponding figures were 86.67, 23.52 and 38.67 man days accounting for about 58.40, 15.80 and 25.80 per cent of the total labour use. It was further observed that men and women's participation was higher in the case of beneficiary households as compared to non-beneficiary households. On the other hand, children's participation was marginally higher in non-beneficiary households (25.80%) than that of beneficiary households (14.69%). Similar findings were also observed by Sharma and Singh (1995) and Meena et al (2009). Children's participation by beneficiary households was reduced by 26.14 per cent.

It may be observed from the table that overall income and women employment were significantly higher in the beneficiary households as compared to non-beneficiary ones. This can be mainly attributed to higher production as a result of adoption of improved technology by the member group. Further,

Table 6: Income and Employment of households

Particulars	Mean of Beneficiary ($\bar{x}1$)	Mean of Non-beneficiary ($\bar{x}2$)	Change	S.D. of Beneficiary (S_1)	S.D. of Non-Beneficiary (S_2)	"Z" values
Income (Rs./Household/Annum)						
Field crops	28488.89 (75.28)	18555.56 (85.53)	9933.33 (53.53)	13615.87	11961.22	3.67**
Vegetables	5955.56 (15.74)	-	5955.56 (+)	10916.95	-	-
Livestock & livestock products	3400.00 (8.98)	3140.00 (14.47)	260.00 (8.28)	2157.44	1749.73	0.63
Total	37844.45 (100.00)	21695.56 (100.00)	16148.89 (74.43)	20146.01	12154.33	4.60**
Employment (Man days/Household)						
Men	117.33 (60.35)	86.67 (58.40)	30.66 (35.38)	91.76	61.60	1.86
Women	48.53 (24.96)	23.52 (15.80)	25.01 (106.34)	72.24	42.67	2.98**
Children	28.56 (14.69)	38.67 (25.80)	-10.11 (-26.14)	42.40	61.18	-1.82
Total	194.42 (100.00)	148.86 (100.00)	45.56 (30.60)	106.36	133.16	1.88

Figures in parentheses of column no. 4 indicate percentage increase in income and employment of beneficiary over non-beneficiary. Figures in parentheses of column no. 2 and 3 indicate the percentage of total income and total employment in respective categories. ** Significant at 1% level of significance; + Mathematically infinity implying a very large increase.

project extended various technologies and technical inputs such as cultivation of vegetables, nursery raising, installation of sprinkler, improved harvesting implements, nutrigarden, varietal replacement, backyard poultry and improved management practices to the beneficiary which might have led to greater production resulting into higher income. A considerable increase in the income and employment of beneficiary households vis-à-vis non-beneficiary households was observed in the present study which leads to conclude that there is a positive impact of livelihood project on overall income and employment of beneficiary households.

CONCLUSION

The results of the study indicated that farmer-producers in beneficiary group were materially better off compared to their counterparts in non- beneficiary group. Further, overall income and women's employment in case of beneficiary households was significantly higher than non- beneficiary ones. The livelihood and nutritional security project can therefore, be expected to provide a better source of income by creating an enhanced scope for gainful employment to the family labour. The study in nutshell indicated a positive impact of project on the socio-economic status, income and employment in study area. The study suggested that steps should be taken to bring more number of farmer-producers under the project network by making them aware about the benefits of the project for their economic development in the study area.

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STATISTICAL ASSESSMENT OF DEVELOPMENT IN RAJASTHAN

Bhupendra Upadhyay*

ABSTRACT

The present study was conducted for three points of time i.e. year 1980-81, 1990-91 and 1996-97. The district was considered as the unit of analysis and twenty six districts as existed in the year 1980-81 were included in the study which covered the entire geographical area of the state. For measuring development, 47 indicators were used to construct the composite indices of development for each district of Rajasthan. The values of mean composite index for the year 1980-81, 1990-91 and 1996-97 were obtained as 0.851, 0.836 and 0.824 respectively. The difference between the periods 1980-81 & 1990-91 and 1980-81 & 1996-97 was found significant whereas difference in development between the year 1990-91 and 1996-97 was observed to be non-significant.

INTRODUCTION

Development is a multi-dimensional phenomenon and defined as a process which improves the quality of life. Development is both a cause and consequence of change. There is two way relationship between the development and the change, i.e. development influences and is influenced by change. Change implies physical, technological, economic, social, cultural, attitudinal, organisational and political change. Development of a region or a state can be identified with the increase in the production, amenities, practice and adoption of new and modern technology and increased rate of investment and consumption. Any change for betterment in these parameters indicate development. Development in a country varies from place to place depending upon its geographical, ecological and climatic conditions. As a result, the level of development of different parts of the country may vary between the very high developed and extremely backward categories.

The state of Rajasthan is situated in the north-western part of the Indian Union. It is the largest state with a geographical area of 3.42 lakh sq. kms. The shape of Rajasthan is like an irregular rhomboid, covering a distance of 869 kms from west to east and 826 kms from north to south. It shares its geographical boundaries with the states of Punjab, Haryana,Uttar Pradesh, Madhya Pradesh and Gujarat. It also has a long international border with Pakistan. It is a diverse state. The region to the west and north-west spreading in 61.11 per cent of the total area is either desert or semi-desert which forms the Great Indian 'Thar' desert. The Aravali range of Hills-one of the oldest mountain ranges-runs through the heart of the state, extending to 69.2 kms and dividing into two portions.

Various schemes have been implemented under the successive five-year plans for the development of the various districts of the Rajasthan state. However, all the districts of the state are not at the same level of development. Some districts are more developed while others are less developed or underdeveloped. The task before the policy makers and planners is to attain all round development. It has been the continuous endeavour of scientists and planners to measure the level of development in different regions of the country in order to identify where a given region stands in relation to others.

The impact of development in different dimensions cannot be fully measured by any single indicator. Moreover, a number of indicators when analysed individually, do not provide an integrated and comprehensible picture of reality. Hence, there is need to build up a composite index of development based on various indicators combined in an optimum manner. Very few efforts have been made to assess the level of development in Rajasthan state at district level. Therefore, the present study was conducted with the following specific objectives:

(i) To construct the various indices of development

* Professor, Dept. of Agri. Statistics and Computer Application, Rajasthan College of Agriculture, MPUAT, Udaipur.

for each district of Rajasthan and rank the districts on the basis of their development.

(ii) To examine the significance of overall change in development indices over three points of time.

RESEARCH METHODOLOGY

In order to assess the development of Rajasthan state, the study was carried out for three points of time i.e. 1980-81, 1990-91 and 1996-97 with the purpose of examining the significance of change and variability in development. The study is based on the data gathered for 26 districts of Rajasthan as existed in the year 1980-81 in spite of separate information for 32 districts existing in 1997. The information of newly formed districts have been included in the original districts from which they have been bifurcated, since the data related to new districts were not available for all the three selected points of time.

In the present study the development of Rajasthan state has been measured in terms of development in agricultural, industrial, infrastructural and socio-economic sectors. After reviewing the literature, a number of indicators depicting the development in these sectors were listed and relevant indicators were identified. In all 47 indicators were selected for assessing the development of each district.

The composite indices for various districts for development were obtained through the formula suggested by Narain et al. (1991). The value of composite index is non-negative and it lies between 0 and 1. The value of index closer to zero indicates the higher level of development while the value of index closer to 1 indicates the lower level of development. In order to examine the significance of overall change in development indices over three selected points of time, Slippage test proposed by Rai (1987) was applied.

RESULTS AND DISCUSSION

I. Construction of composite indices of development for each district of Rajasthan : This section describes the construction of indices of development for each district of Rajasthan. To construct composite indices of development, variables were standardised. The best district for each indicator (with maximum/ minimum standardised value depending upon the direction of the indicator) was identified and the deviations of different indicators from their best value were obtained for each district. The districts were ranked on the basis development indices.

Perusal of Table 1 depicts that out of 26 districts included in the analysis for the year 1980-81, the district Jaipur ranked first followed by Kota, Udaipur, Ajmer and Bhilwara while the districts Barmer, Tonk, Nagaur, Jalore and Jaisalmer were ranked at last in the development. The values of composite indices varied from 0.638 to 0.950.

The Table 1 further reveals that the composite indices of development for the period 1990-91 varied from 0.660 to 0.997 with mean index 0.836 and CV 9.976. Data indicates that the district Jaipur continued to rank first followed by Alwar, Udaipur, Kota and Ajmer during this period too in the overall ranking. The district Churu, Sawai Madhopur, Jalore, Barmer and Jaisalmer occupied last ranks in the development.

The data in the Table 1 further depicts that the district Jaipur again continued to rank first followed by Udaipur, Bhilwara, Ajmer and Kota during the period 1996-97 in the ranking of development. Again the desertic districts like Jhunjhunu, Jalore, Churu, Barmer and Jaisalmer occupied the last five rankings. During this period Bhilwara district exhibited major change which moved to third place from twelfth rank on the basis of its overall development. The value of composite indices varied from 0.625 to 0.968 during this period. The mean index of development was 0.824 with CV 10.929 per cent.

II. Significance of overall change in development indices over three points of time : Having obtained the measure of development (composite index) for each district over different points of time, an attempt was made to examine the significance of change in development indices over time. Data in the Table 2 shows the composite indices of overall development of each district and their ranking over three points of time. The ranking over different point of time has been examined and the value of test statistic M was worked out to be 8.21 which was significant at 5 per cent level of significance. This indicates the rejection of null hypothesis of no change in development in

Table 1 : Composite indices of development of each district for three points of time

District		1980-81		1990-91		1996-97	
		CI	Rank	CI	Rank	CI	Rank
1.	Ajmer	0.762	4	0.745	5	0.719	4
2.	Alwar	0.824	9	0.705	2	0.732	7
3.	Banswara	0.887	16	0.876	16	0.861	15
4.	Barmer	0.925	22	0.965	25	0.953	25
5.	Bharatpur	0.820	8	0.817	11	0.820	12
6.	Bhilwara	0.764	5	0.822	12	0.709	3
7.	Bikaner	0.895	18	0.883	18	0.860	14
8.	Bundi	0.830	10	0.851	13	0.856	13
9.	Chittorgarh	0.810	7	0.774	7	0.762	8
10.	Churu	0.914	21	0.907	22	0.952	24
11.	Dungarpur	0.897	19	0.889	20	0.878	20
12.	Ganganagar	0.796	6	0.773	6	0.727	6
13.	Jaipur	0.638	1	0.660	1	0.625	1
14.	Jaisalmer	0.950	26	0.997	26	0.968	26
15.	Jalore	0.946	25	0.936	24	0.912	23
16.	Jhalawar	0.886	15	0.884	19	0.869	18
17.	Jhunjhunu	0.878	13	0.863	14	0.909	22
18.	Jodhpur	0.839	11	0.807	9	0.786	9
19.	Kota	0.739	2	0.730	4	0.722	5
20.	Nagaur	0.926	24	0.865	15	0.867	16
21.	Pali	0.879	14	0.815	10	0.796	10
22.	Sawai Madhopur	0.844	12	0.908	23	0.868	17
23.	Sikar	0.908	20	0.892	21	0.890	21
24.	Sirohi	0.892	17	0.799	8	0.807	11
25.	Tonk	0.931	23	0.877	17	0.870	19
26.	Udaipur	0.752	3	0.706	3	0.695	2
	Mean	0.851		0.836		0.824	
	S.D.	0.076		0.083		0.090	
	CV	8.904		9.976		10.929	

CI = Composite index

Table 2 : Ranking of composite indices of development of each district over three points of time

District	1980-81		1990-91		1996-97	
	Composite index	Rank	Composite index	Rank	Composite index	Rank
Ajmer	0.762	3	0.745	2	0.719	1
Alwar	0.824	3	0.705	1	0.732	2
Banswara	0.887	3	0.876	2	0.861	1
Barmer	0.925	1	0.965	3	0.953	2
Bharatpur	0.820	2.5	0.817	1	0.820	2.5
Bhilwara	0.764	2	0.822	3	0.709	1
Bikaner	0.895	3	0.883	2	0.860	1
Bundi	0.830	1	0.851	2	0.856	3
Chittorgarh	0.810	3	0.774	2	0.762	1
Churu	0.914	2	0.907	1	0.952	3
Dungarpur	0.897	3	0.889	2	0.878	1
Ganganagar	0.796	3	0.773	2	0.727	1
Jaipur	0.638	2	0.660	3	0.625	1
Jaisalmer	0.950	1	0.997	3	0.968	2
Jalore	0.946	3	0.936	2	0.912	1
Jhalawar	0.886	2	0.884	1	0.868	3
Jhunjhunu	0.878	2	0.863	1	0.909	3
Jodhpur	0.839	2	0.807	1	0.786	3
Kota0.739	3	0.730	2	0.722	1	
Nagaur	0.926	3	0.865	1	0.867	2
Pali 0.879	3	0.815	2	0.796	1	
Sawai Madhopur	0.844	1	0.908	3	0.868	2
Sikar0.908	3	0.892	2	0.890	1	
Sirohi	0.892	3	0.799	1	0.807	2
Tonk	0.931	3	0.877	2	0.870	1
Udaipur	0.752	3	0.706	2	0.695	1
Rank Total (Ri)		63.5		49		43.5
Mean	0.851		0.836		0.823	

districts over time. It was concluded that the level of overall development is significantly different over three points of time. Since the null hypothesis was rejected, multiple comparisons were made. Following differences of sums of ranks were observed :

$|Rt1 - Rt2| = 14.5$

$|Rt1 - Rt3| = 20.0$

$|Rt2 - Rt3| = 5.5$

The critical difference at 5 per cent level of significance was computed as 12.21. The difference between the periods 1980-81 and 1990-91 and, 1980-81 and 1996-97 was found significant whereas difference in overall development between the year 1990-91 and 1996-97 was observed to be non-

significant.

The perusal of the table reveals that mean value of composite index has decreased from 0.851 in the year 1980-81 to 0.836 in the year 1990-91 which indicates that level of development has gone up during these points of time. The same was observed for the year 1990-91 and 1996-97 which is illustrated by the decrease in the mean index value from 0.836 to 0.823 respectively.

Changes in development indices of seventeen major states of India over two periods of time i.e. 1971-72 and 1981-82 was also statistically examined by Narain et al. (1991) using the slippage test. The study concluded that the level of development was significantly different between the two periods of time.

CONCLUSION

From the above discussion it can be concluded that for the selected points of time, Jaipur, Udaipur, Kota, Ajmer, and Bhilwara districts were found to be better developed in comparison with other districts. Jaisalmer, Barmer, Churu, Jalore, Jhunjhunu and Sikar were identified as poorly developed districts.

The values of mean composite index for the year 1980-81, 1990-91 and 1996-97 were obtained as 0.851, 0.836 and 0.824 respectively which indicates improvement in level of development. The difference between the periods 1980-81 & 1990-91 and 1980-81 & 1996-97 was found significant whereas difference in development between the year 1990-91 and 1996-97 was observed to be non-significant.

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EFFECT OF PRICE FLUCTUATION ON RURAL LIVELIHOOD OF BASMATI GROWERS IN R.S. PURA BELT OF JAMMU DISTRICT

Rakesh Kumar*, Pawan Kumar Sharma, P.S. Slathia*** and Narinder Paul******

ABSTRACT

A study was undertaken in R.S.Pura block of Jammu district to assess the effect of price fluctuation on rural livelihood of Basmati growers. A total of 70 respondents including farmers, traders and rice millers were interviewed through personal interview method for primary data collection. It was concluded that price fluctuation of Basmati is affecting the routine family and farm plans of those families whose livelihood totally depends upon the farming enterprise. Further it was concluded that present market price does not cover the cost of production. The major reasons put forward by farmers, traders and millers was inadequate government policy regarding marketing of Basmati rice.

INTRODUCTION

Basmati-370 is regarded as super specialty rice with highest demand of export and a good earner of foreign exchange for the country in general and state of Jammu & Kashmir in particular.This paper is mainly confined to the study of effect of price fluctuation of Basmati paddy on its growers' livelihood and possible reasons for this abrupt fluctuation. Agriculture not only contributes to overall growth of the economy but also reduces poverty by providing employment and food security to the majority of the population in the country and thus, it is the most inclusive growth sector of the Indian economy. Small holdings agriculture is important for raising agriculture growth, food security and livelihoods in India. It may be noted that Indian agriculture is the home of small and marginal farmers (80 %) (Dev, 2014). More than two-thirds of the workforce has its main single income source in agriculture. In rural areas, though recent research shows that the rural poor derive significant, growing parts of income from non-farm work, agriculture is the main income source (Lipton, 2006). Farm families livelihood mainly of small and marginal farmers directly depends upon the performance of agricultural sector i.e. yield they obtain from the field and the price offered to their produce in the market. Both yield fluctuation and price fluctuation affect the farmers but the effect of price fluctuation is noticed more on the rural livelihood of the farmers. Price fluctuation of Basmati paddy especially from the last three or four years is effecting the livelihood of its growers and that too in the period when cost of its production is increasing continuously. Paddy is one of the major staple food crop grown in the Jammu division during Kharif season. Paddy especially world famous Basmati-370 variety of Basmati is grown on an area of about 29,000 ha (2013-14) in Jammu district. In R.S.Pura block it is grown on an area of about 15320 ha (BEDF, 2014). Besides personal consumption, every farmer has marketing surplus to sale in the market as per the size of land holding to fulfill the needs of family and farm. There was found a high level of uncertainty in prices of Basmati especially in the last three years. The highest price of Basmati was witnessed at Rs. 6800/q in April, 2014 and lowest was Rs 2000/q in June 2015 and current price of Basmati-370 paddy is Rs 3500/q (April, 2017). This price fluctuation of Basmati is affecting the rural livelihood of farmers in different ways and also affecting the future prospectus of Basmati cultivation. Socio-economic status of the farming community is one of the most well thought issue that needs a special attention. Small and marginal farmers having fragmented land holdings constitute 94

*Division of Agricultural Extension Education, FoA, Main Campus, Chatha, SKUAST, Jammu.
**KVK-Kathua, SKUAST, Jammu.
***Division of Agricultural Extension Education, FoA, Main Campus, Chatha, SKUAST, Jammu.
****KVK-Doda, SKUAST, Jammu.

percent of the total land holdings in J&K state. Unorganized marketing, distribution and poor infrastructure etc. are the socio-economic constraints affecting agriculture in J&K (Kachroo, 2014).

Objectives: Keeping in view the importance of Basmati in rural livelihood security a study was undertaken in R.S.Pura block of Jammu District with following objectives:

1. To assess opinion of farmers about Basmati as specialty crop of R.S. Pura.
2. To study the effect of Basmati price fluctuation on different aspects of rural livelihood.
3. To work out the reasons behind price fluctuation of Basmati.

RESEARCH METHODOLOGY

The present study was conducted in 10 randomly selected villages of R.S. Pura block. From each selected village, five farmers were randomly selected, and a total sample of 50 farmers was obtained. Further in order to get clear picture about Basmati price fluctuation, 10 Basmati traders and 10 Basmati millers were also selected purposively. The data was collected through personal interview method with the help of a pre-framed schedule containing both open ended and closed type questions.

RESULTS & DISCUSSION

Table 1: Range of price fluctuation of Basmati

Year	Month	Average Price (in Rs/q)
2013	Nov	Rs 3300
	Dec	Rs 4450
2014	Jan	Rs 5000
	Feb	Rs 6000
	March	Rs 6000
	April	Rs 6800
	July	Rs 5500
	September	Rs 4500
	Nov	Rs 4000
	Dec	Rs 3000
2015	Jan	Rs 3000
	Feb-may	Rs 2500
	June	Rs 2000
	July-Oct (till date)	Rs 2200

Source : Millers & Traders of Basmati paddy operating in the study area

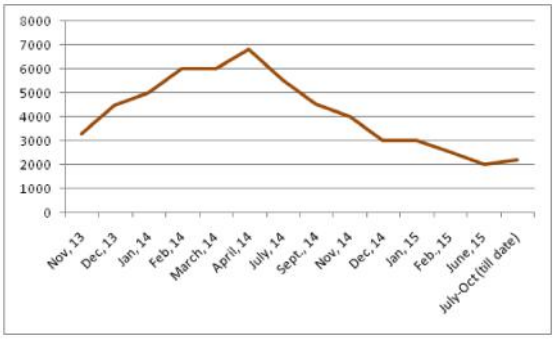

Figure 1: Price trend of Basmati rice in Jammu

From the analysis of figures given in the table1 and graph shows that highest price of Basmati paddy was Rs 6800 and lowest was Rs 2000 in June 2015 and from there onwards it is showing the downward trend thereby affecting the rural livelihood of the farmers cultivating Basmati crop. This price fluctuation also affecting the small traders and millers associated with the trade of Basmati crop.

Table 2: Opinion of farmers regarding Basmati as special crop & its price fluctuation

S. No.	Opinion statements	DA	N	A
1.	Do you think Basmati of R.S.Pura is special?	0	0	50 (100)
2.	Do you think present price of Basmati is reasonable?	50 (100)	0	0
3.	Do you think present price covers cost of production?	40 (80)	0	10 (20)
4.	Do you think price of Basmati fluctuates every year?	05 (10)	0	45 (90)
5.	Fluctuation of price is highest this year	0	0	50 (100)
6.	Fluctuation of price resulted in shift of Basmati to other variety	35 (70)	10 (20)	05 (10)
7.	Family economy totally depends upon Basmati	15 (30)	0	35 (70)
8.	Social status depends upon Basmati cultivation	40 (80)	0	10 (20)
9.	Hybrid rice is more profitable than Basmati variety	35 (70)	05 (10)	10 (20)

DA-Disagree, N-Neutral, A-Agree, Figures in parenthesis shows percentage

A perusal of Table 2 depicts that 100 percent respondents considered Basmati is a special crop grown in R.S.Pura block of Jammu District having its presence in national and international market. Further hundred percent of farmers were of the view that present price of Basmati crop does not cover the cost of production; fluctuation of Basmati crop was highest in the year 2014. Analysis of table further shows that 70 percent farmers did not agree with the view that price fluctuation in the Basmati crop resulting in the replacement of Basmati paddy cultivation with other varieties. Further 70 percent farmers in the study area did not agree with the fact that hybrid rice is more profitable than Basmati crop but 20 percent farmers were of the view that with present price, cultivation of hybrid varieties of rice is more profitable than the Basmati-370.

Table 3: Livelihood sectors of farm families affected by price fluctuation of Basmati (Multiple responses)

S. No.	Livelihood sectors	No.	%age	Rank
1.	Purchase of milch animal	40	80	II
2.	Construction of animal shed	30	60	IV
3.	Repayment of KCC loan, if any	10	20	VI
4.	House construction and repairing	35	70	III
4.	Installation of pump set for irrigation	25	50	V
5.	Meeting routine expenditures of family	40	80	II
6.	Fulfilling social obligations (Such as marriages or other social functions)	45	90	I

An in-depth study of Table 3 shows that price fluctuation of Basmati crop is affecting different aspects of rural livelihood of farm families. The main livelihood sector affected by price fluctuation of Basmati was fulfilling family social obligation such as marriages in the family. Further, 80 percent of the farmers were of the view that their routine family expenditures were affected by the price fluctuation of Basmati crop. Same percentage of farmers were of the view that they could not purchase any milch animal due to less price offered for their Basmati crop in the market which is a good source of income along with income earned from the sale of farm produce.70 percent farmers reported that they could not repair their houses due to price fluctuation and 60 percent were of the view that their plan of constructing pucca animal shed remained unfulfilled. Further 50 percent farmers reported that they have to postpone the plan of installing electric pump set in their field for assured irrigation facility. Only 20 percent farmers were of the view that they could not timely repay loan taken from banks under Kissan credit card scheme. Thus it was observed that different socio-economic aspects of farm families are affected by the price fluctuation of Basmati crop. Singh *et al.,* 2014 also found in his study that almost all categories of farmers were obtaining major part of their family livelihood from crop production.

Table 4: Major reasons conceived by farmers behind price fluctuation of Basmati

N=50 (Multiple responses)

S. No.	Reasons for price fluctuation	No.	%age	Rank
1.	Malpractices of millers. i.e Mixing of non-Basmati with Basmati rice	35	70	III
2	Main supply not as per sample passed	30	60	IV
3	Inadequate govt.policies	40	80	II
4	Ban on export of Basmati from state	50	100	1

Analysis of Table 4 shows the reasons perceived by the farmers behind price fluctuation.100 percent of the farmers were of the view that state government has banned the export of Basmati from the state followed by inadequate government agriculture trade policies.70 percent farmers held responsible mal practices of millers behind the low price of world famous Basmati crop. Farmers were of the view that some millers mix non-Basmati rice with Basmati rice and sell it as branded Basmati which has deteriorated the quality of Basmati and affected the demand of R.S. Pura Basmati-370.Verma *et al.* (2013) in his study

also found that poor produce procurement policy of government affect the paddy cultivation.

Table 5: Major reasons conceived by Traders behind price fluctuation of Basmati

N=10

S. No.	Reasons for price fluctuation	No.	%age	Rank
1	Ban on export of brown rice	08	80	II
2	Lack of clear govt. policies regarding marketing of Basmati	10	100	1
3	Less demand from foreign countries	05	50	IV
4	Low domestic demand	07	70	III

It has been observed from the analysis of data given in Table 5 that as per traders major reasons behind price fluctuation was lack of clear government policies (100 percent) followed by ban on export of brown rice i.e. semi-milled rice.70 percent traders were of the view that low domestic demand is the reason behind price fluctuation of Basmati rice and 50 percent traders were of the view that less demand from foreign countries was the main reason behind price fluctuation of Basmati rice.

Table 6: Major reasons conceived by Millers behind price fluctuation of Basmati

S. No.	Reasons for price fluctuation	No.	%age	Rank
1	Less demand from traders of other states	6	60	V
2	Ban on export of Basmati	10	100	I
3	Inadequate govt agri trade policies with other countries	9	90	II
4	Low domestic demand	8	80	III
5.	Adultration practices of some millers	7	70	IV

The close scrutiny of data presented in Table 6 depicts that almost same reasons put forth by big millers as putforth by traders behind price fluctuation of Basmati rice.100 percent miller were of the view that ban on export of Basmati rice was main reason behind low prices of Basmati followed by inadequate government agricultural trade policies with other countries.70 percent millers were of the view that adulteration practices of some fellow Basmati millers in the market are the potent reasons behind the low price of Basmati. 60 percent millers were of the view that less demand from the traders of other states is the main reason behind price fluctuation of Basmati rice.

CONCLUSION

1. Farm family's livelihood and business houses dependent upon Basmati were badly hit by the price fluctuation of Basmati.
2. The area under Basmati cultivation remained almost same in the hope of better price in future.
3. The prevailing price of Basmati does not cover the cost of production.
4. All the stakeholders considered lack of clear government policies behind price fluctuation of Basmati.
5. There must be a Basmati export zone in Jammu as apple export zone in Kashmir, for price stabilization of Basmati rice.
6. Provision of minimum support price (MSP) of Basmati may also improve the situation.
7. There should be stringent quality check-up mechanism of Basmati brought from other states.
8. Food Safety & Security Act should be strictly implemented to check adulteration in Basmati.
9. Farmers should be motivated to go for farm diversification as it can enhance the income of the farmers from different farming enterprises and their dependency only crop production may decrease.

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PROBLEMS FACED BY THE COLLEGE STUDENTS IN USE OF INTERNET

Snehlata Maheshwari* and Rajshree Upadhyay**

ABSTRACT

Internet facility is widely used for research and academic work by the students. Students also use internet for various other purposes. The present study attempts to explore the problems faced by the students in use of internet. The study was conducted in colleges of Maharana Pratap University of Agriculture & Technology, Udaipur. A sample of 100 PG students (50 boys and 50 girls) was selected randomly. Majority of the respondents reported the problems regarding virus, over information availability, unorganized information, physical health problems and slow speed.

INTRODUCTION

Education these days has been the top priority for a family or an individual, and no doubt amongst the latest technologies to promote and maintain the education standards, the internet comes first. Internet is not only an access to websites, these days there is knowledge and information on every aspect of the educational world over the internet. It is a power ful means of communication, dissemination and retrieval of information. Internet facility is widely used for research and academic work by the students. The internet has evolved to become one of the fastest and most efficient tools a student can use to perform research and to learn about the world. The use of internet is not free from problems. The present investigation explores the problems faced by the students in internet use.

RESEARCH METHODOLOGY

The study was conducted in colleges of Udaipur campus of Maharana Pratap University of Agriculture & Technology, Udaipur viz. College of Home Science, Rajasthan College of Agriculture, College of Fisheries and College of Technology and Engineering. A sample of 100 PG students (50 boys and 50 girls) from the students enrolled in the academic year 2010-11 and 2011-12 were selected randomly. The data were collected through questionnaire method and analyzed by use of frequency and percentage.

RESULTS AND DISCUSSION

The results pertaining to problems faced by the students have been presented in three categories as before use, at the time of use and after use of internet in the Table 1 to 3.

a) Problems before using internet : The information presented in Table 1 depict the problems faced by the respondents before internet use. The problems related to institute presented in Table 1 indicate that 50-55 percent respondents reported for unequal time distribution (55%), inadequate physical facilities (50%) and limited number of computers (50%) followed by 30 percent respondents also reported for lack of internet facility in all the departments. In case of boys and girls more girls faced the problem of unequal distribution of time among students (64%) and inadequate physical facilities (60%) while more boys respondents (56%) faced the problem of limited number of computers. A few number of girls (24%) and 36 percent boys reported the problem of lack of internet facility in all the departments.

Further data in the table shows that 24-43 percent respondents reported for personal problems such as cyber café is far from home (43%), do not have internet facility at home (38%), limitation of time at café (33%), do not have own computer (27%) and financial problem (24%). In case of boys and girls, more boys (34-46%) reported for all these problems than girls. These problems may be due to transition phase of university where efforts are being made to provide computers with internet facility by every year having additional increased facility and in future, may be within short period of time, all the students will have

*Professor, Dept. of Ext. Edu. and Communication Management, College of Home Science, MPUAT, Udaipur
** Professor & Head, Dept. of Ext. Edu. and Communication Management, College of Home Science, MPUAT, Udaipur

computer facility.

Table 1: Distribution of respondents by the problems faced before using internet

n=100

S. No.	Category	Boys (%) n1=50	Girls (%) n2=50	Total (%)
1.	Related to institute			
a)	Unequal time distribution among students	46	64	55
b)	Inadequate physical facilities	40	60	50
c)	Limited number of computers	56	44	50
d)	Lack of internet facility in all departments	36	24	30
2.	Personal Problems			
a)	Cyber café is far from home	46	40	43
b)	Do not have internet facility at home	38	38	38
c)	Limitation of time at café	52	14	33
d)	Do not have own computer	42	12	27
e)	Financial problem	34	14	24

Findings by Kumar *et al*. (2007) support that students expressed inadequate internet facility provided by university (65%) and improper services provided in cyber café (42%).

b) Problems at the time of using internet : At the time of using internet, students faced many problems related to computer, network, internet knowledge and information. In Table 2, computer related problems reveals that majority of the respondents reported for the uncertain power cut (49%) and non functioning of PC (42%). Lack of computer knowledge was reported by 27 percent respondents followed by 17 percent respondents reported for difficulty in computer handling. Similar trend was found in boys and girls that 12-40 percent boys and 22-58 percent girls faced the problem of uncertain power cut, non functioning of PC, lack of computer knowledge and difficulty in computer handling. These problems were faced due to shortage of power, leading to low availability of electricity as well as non functioning of PC due to technical faults or virus problem.

Network related problems presented in Table 2 show that majority of the respondents were experiencing virus problem (78%), long time to open PDF files (58%), uncertainty of connectivity (58%), slow speed (56%) and problem in file downloading (51%). In case of boys and girls, more girls reported for all these problems than the boys. It is important to note that 92 percent girls reported for virus problem. The virus problem is the major problem in internet access and it may be due to unavailability of antivirus software because of administrative problems.

Problems related to internet knowledge reveal that 14-29 percent respondents reported for lack of skills to access internet (29%), lack of skills to access websites (24%), difficulty in handling internet (18%) and language problem (14%). In case of boys and girls 20-34 percent boys and 14-29 percent girls faced these problems. This may be due to lack of trainings to internet access as the students are learning on their own by hit and try or from friends. Girls usually sit for long hours and concentrate on work and try to find out solutions while boys lose patience, lack concentration and sitting long hours and solving problem on internet.

The table further depicts that 47-67 percent respondents faced information related problems such as overloaded information availability (67%), unorganized information (66%), and difficulty in finding relevant information (47%). Comparative problems within boys and girls reveals that girls reported for the similar problems while majority boys reported for unorganized information (68%), difficulty in finding relevant information (56%) and overloaded information availability (42%).

c) Problems after using internet : Internet use can change person's personality. Effect of internet is positive as well as negative. Excess use of internet creates negative effect on physical as well as social life of the respondents. After using internet students also faced many problems such as problems related to physical health and social life.

Table 2: Distribution of respondents by the problem faced at the time of using internet

n=100

S. No.	Category	Boys (%) n1=50	Girls (%) n2=50	Total (%)
1.	**Related to computers**			
a)	Uncertain power cut	40	58	49
b)	Non functioning of PC	38	46	42
c)	Lack of computer knowledge	24	30	27
d)	Difficulty in handling computer	12	22	17
2.	**Related to network**			
a)	Virus problem	64	92	78
b)	Slow speed	44	68	56
c)	Problem in file downloading	48	54	51
d)	Takes long time to open PDF files	56	60	58
e)	Uncertainty of connectivity	56	60	58
3.	**Related to internet knowledge**			
a)	Lack of skills to access internet	34	24	29
b)	Lack of skills to access websites	32	16	24
c)	Difficulty in handling internet	22	14	18
d)	Language problem	20	8	14
4.	**Related to information**			
a)	Over information availability	42	78	67
b)	Unorganized information	68	64	66
c)	Difficulty in finding relevant information	56	52	47

Table 3: Distribution of respondents by the problems faced after using internet

n=100

S. No.	Category	Boys (%) n1=50	Girls (%) n2=50	Total (%)
1.	**Related to physical health**			
a)	Effect on eyes	80	98	89
b)	Effect on back	68	94	81
c)	Reduce physical movement	68	82	75
d)	Effect on neck	52	92	72
e)	Adoption of wrong treatment cause physical hazards	64	78	71
f)	Increased fatigue	66	70	68
g)	Weight increases	62	68	65
h)	Effect on shoulder	44	72	58
i)	Create behavior irritation	48	66	57
j)	Effect on fingers	58	50	54
k)	Mental stress	38	64	51
l)	Effect on hands	36	60	48
m)	Eating disorders	44	48	46
n)	Effect on legs	34	42	38
2.	**Related to social life**			
a)	Developed isolated personality	60	66	63
b)	Reduced movement in society	54	70	62
c)	Less time for social life	46	58	52
d)	Decrease social relations	42	48	45
e)	Increase selfishness	44	46	45

Data in Table 3 indicate that in case of physical health almost all problems were reported by around 50 or more than 50 percent of respondents. Only the problem related to effect on legs was reported by 38 percent respondents. Majority respondents (71-89%) reported for effect on eyes (89%), back (81%), reduced physical movement (75%), effect on neck (72%) and adoption of wrong treatment can cause physical hazards (71%). From 51-68 percent respondents reports for increased fatigue (68%), weight increase (65%), effect on shoulder (58%), create behavior disorder (57%), effect on fingers (54%) and mental stress (51%). The problem of effect on hands and eating disorders were also reported by 48 and 46 percent respondents respectively. In case of boys and girls 48-98 percent girls and 58-80 percent boys

reported for effect on eyes, back, neck etc to effect on finger, eating disorders while among boys mental stress, effect on hands and legs was reported by 34-38 percent respondents only.

Problems related to social life presented in the table clearly reveals that more use of internet developed isolated personality (63%), reduced movement in society (62%), less time for social life (52%) among respondents and equal number of respondents reported that internet decreases social relations (45%) and increase selfishness (45%). In depth review regarding boys and girls respondents in Table 3 reveals that internet developed isolated personality and reduced movement in society as reported by 54, 60 percent boys and 66, 70 percent girls respectively. A good percentage of boys and girls reported for, less time for social life, decreased social relations and increased selfishness by 42, 44 and 46 percent boys and 48, 46 and 58 percent girls respectively. These problems may be due to excessive and continuous use of internet.

CONCLUSION

It can be concluded that in internet use, majority of the respondents reported the problems regarding virus, over information availability, unorganized information, physical health problems and slow speed. More computers with latest specification should be arranged in colleges to facilitate students for internet use according to time availability with them. The trained and technical staff should be appointed for guidance of students in using internet facility along with computers. Entertainment websites should be blocked by the university to control unnecessary use of internet by students.

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A STUDY ON PROFILE OF SELF HELP GROUP MEMBERS OF UDAIPUR DISTRICT

Priyanka Kumawat* and Vishakha Bansal**

ABSTRACT

The study was conducted in Udaipur district of Rajasthan to study the profile of self-helpgroupsmembers of Udaipur district. Total ten groups were selected from Badgaonpanchayatsamiti. A sample of 130 respondents (100 SHG members and 30 non members) was selected for present study. Interview technique was used for collecting data. The result reveals that majority of the office bearers (25%) were from mediumsocio-economic status where as only 5 per cent of the respondents had low socio-economic status. Among members, majority of the respondents (50%) were from lowsocio-economic status and 20 per cent of the respondents had medium socio-economic status. None of the respondents had high socio economic status.

INTRODUCTION

Women empowerment is a term that has gained currency in the human development and government discourse. Amongst the 8th millennium economic development goals, women empowerment is one of the most crucial goals. UNDP reports (2004) indicated that while 67 per cent work is done by women yet, only 10 per cent global income is earned by them. In India 50 per cent of the total population constitutes of women but women workers constitute only 16 per cent of the total population(Sunder et al., 2001). The educated Indian women are empowered because she knows her rights. But women belonging to the weaker or poorer sections of the society still face problems like domestic violence, dowry harassment, sexual harassment, etc. According to census report 2011, 82.14 per cent literate person are male whereas only 65.46 per cent women are literate which shows the educated society is dominated by male in India. Women earn one third of the remuneration and own only 10 per cent of the property of the country. From such kind of study, it is found that women are still a prey of gender biasness in our society. The Self help groups are the most significant way of bringing about socio-economic change in our society. With this in view, the study wasconducted tobackground information of the SHG members of Udaipur district.

RESEARCH METHODOLOGY

In Rajasthan state, one district i.e. Udaipur was selected because Maharana Pratap Agriculture University is situated in this district and the investigatoris the resident of the district and familiar with the socio economic conditions of the area, which face lifted in data collection. There were 17 blocks in Udaipur district from which one block was selected and five villages having maximum number of SHGs were selected purposively.In which, two SHGs were selected randomly from each of the selected villages. There were 10-20 members in each SHG. From each SHG, 10 members were selected randomly to from a total sample of 100 respondents.

RESULTS AND DISCUSSION

The general information of the respondents like age, education, marital status, occupation, caste, family size and type, organizational ownership, land holding, housing, livestock ownership, dwelling, media ownership and their socio-economic status.

Age: Data in Table 1 show the distribution of SHG members according to their age group. Out of total 30 office bearers, more than half of the respondents (60%) belongs to lower middle age group (31-45 years), while 36.6 per cent belongs to young age (18-30 years), and 3.3 per cent belongs to middle age (46-60 years). Out of 70 members, less than half

* Research Scholar, Department of Extension Education and Communication Management, College of Home Science, Maharana Pratap University of Agriculture and Technology, Udaipur, India

**Associate Professor, Department of Extension Education and Communication Management, College of Home Science, Maharana Pratap University of Agriculture and Technology, Udaipur, India

of the respondents (48.6 %) were from young age group, 41.4 per cent respondents belong to lower middle age group, while 10 per cent members belong to upper middle age group. No one was found in old age group (above 60 years).

Das (2012) found that the majority (60.50 %) of the respondents belonged to the age group of 30-40 years. Preethi (2011) also reported that majority (52.50%) of SHG women belonged to middle age followed by 38.75 per cent of them to young age and 8.75 per cent of them to old age.

Mary (2009) reported that more than half (58.82%) of the SHG women were found to be middle aged, while less than one fourth (21.56%) of the respondents were young (upto 34 years) and the remaining less than one fourth (19.60%) of the respondents were old (> 45 years). In general majority of the SHG women were middle aged.

Marital status: Table 1shows the distribution of SHG members according to marital status. Out of total 30 office bearers, majority of the respondents (93.3 %) were married and 6.7 per cent were widow. Out of 70 members, majority of the respondents (85.7 %) were married, 12.6 per cent respondents were widow, while 1.4 per cent member was unmarried.

Occupation: Table 1 shows that out of total 30 office bearers, more than half of the respondents (56.6 %) were engaged in farming, nearly one third respondents (30%) were engaged in farm labour. Very few respondents (6.7 %) were engaged in service sector and non wage earner. Out of 70 members, more than half of the respondents (57.2 %) were engaged in farming, less than half of the respondents (34.3 %) were engaged in farm labour, 7.1 per cent respondents were engaged in non wage earner and very few respondents (1.4 %) were engaged in service sector.

Education: Educational profile of the respondents presented in Table 1 shows that out of total 30 office bearers, less than half of the respondents (46.7 %) were educated upto primary school, 40 per cent were illiterate, & 10 per cent respondents were educated upto middle level. Very few of the respondents (3.3 %) were educated upto graduation and above. Out of 70 members, majority of the respondents (61.4%) were illiterate and can read and write, whereas 24.3 per cent respondents were educated upto middle level. Some of the respondents (14.3 %) were educated upto primary school. A similar study also reported by Gangaiah et al. (2006).

Table 1: Distribution of the SHGs members on the basis of personal variables

N=100

S. No.	Personal variables	Office bearer n=30 f(%)	Member n=70 f(%)
A	**Age**		
	a) 18-30 years	11(36.6)	34(48.6)
	b) 31-45 years	18(60)	29(41.4)
	c) 46-60 years	1(3.3)	7(10)
	d) >60 years	0	0
B	**Marital status**		
	a) Unmarried	0	1(1.4)
	b) Married	28(93.3)	60(85.7)
	c) Widow	2(6.7)	9(12.6)
	d) Divorced	0	0
C	**Occupation**		
	a) Non-wage earner	2(6.7)	5(7.1)
	b) Farm labour	9(30)	24(34.3)
	c) Farming	17(56.6)	40(57.2)
	d) Service sector	2(6.7)	1(1.4)
D	**Education**		
	a) Illiterate/can read and write	12(40)	43(61.4)
	b) Primary school	14(46.7)	10(14.3)
	c) Middle school to Sr. Sec.	3(10)	17(24.3)
	d) Graduate and above	1(3.3)	0

Caste: Persual of Table 2 shows that among office bearers, majority of the respondents (76.7 %) belonged to Other Backward Caste (OBC) and 16.6 per cent belonged to the Schedule caste/ Schedule tribe. Very few of the members (6.7 %) belonged to Upper caste. Out of 70 members, majority of the respondents (64.3 %) were from OBC and 27.1 per cent belonged to SC/ ST. Some of the respondents (8.6 %) belonged to Upper caste.

Family structure: It is evident from Table 2 that majority of the office bearers (60%) had joint families and 40 per cent had nuclear families. With regard to family size, it can be seen that majority of the respondents (60%) had medium sized families with 5-8 members and 23.3 per cent had small families upto 4 members. Some of the respondents (16.7 %) were from large families having more than eight members. Among members, majority of the respondents (71.4 %) had joint families and 28.6 per cent had nuclear families. With regards to family size, nearly one third of the respondents (37.1 %) had medium sized family and 34.3 per cent had small families. Some of the respondents (28.6 %) were from large families.

Organizational membership: As far as organizational membership is concerned, it is evident from Table 2 that all the office bearers and members (100%) were member of formal organization.

Land holding: Persual of data in Table 3 shows the distribution of SHG members according to land holding. Out of 30 office bearers, less than half of the respondents (46.6 %) had 1.0 to 2.5 acres of land, 20 per cent respondents had 5.1 to 10.0 acres land. Some of the respondents (16.7 %) had 2.6 to 5.0 acres land and more than 10 acres land. Out of 70 members, less than half of the respondents (45.7%) had 1.0 to 2.5 acres land, 24.3 per cent respondents had 2.6- 5.0 acres land, 15.7 per cent respondents had 5.1 to 10.0 acres land, some of the respondents (11.4 %) had more than 10 acres and few respondents (2.9 %) had no land.

Housing: Looking into the housing of the respondents majority of the office bearers (63 %) had pucca houses, 20 per cent had mixed houses and 13.3 per cent had kutcha houses. Out of 70 members, more than half of the respondents (51.4 %) had pucca houses, 34.3 per cent had mixed houses and some of the respondents (14.3 %) had kutcha houses.

Livestock ownership: It is evident from Table 3 that out of total 30 office bearers, more than half of the respondents (56.7 %) had small herd size, while 43.3 per cent respondents owned medium herd size. Among majority of the respondents (64.3 %) had small herd size, while 30 and 5.7 per cent respondents owned medium and large herd size respectively.

Dwelling: Table 3 shows the distribution of SHG members according to their dwelling for livestock. Out of 30 office bearers, half of the respondents (50%) had open dwelling for livestock, whereas more than one third respondents (36.6 %) had kutcha and only 13.4 per cent had pucca dwelling for their livestock. Among more than half of the respondents (51.4%) had kutcha dwelling for livestock, more than one third of the respondents (35.7 %) had open dwelling and 12.9 per cent had pucca dwelling for their livestock.

Table 2: Distribution of the SHGs members on the basis of social variables

N=100

S. No.	Social variables	Office bearer n=30 f(%)	Member n=70 f(%)
A.	**Caste**		
	a) OBC	23(76.7)	45(64.3)
	b) SC/ST	5(16.6)	19(27.1)
	c) Upper middle	0	0
	d) Upper caste	2(6.7)	6(8.6)
B.	**Family structure**		
	a) Family type		
	a) Nuclear	12(40)	20(28.6)
	b) Joint	18(60)	50(71.4)
	b) Family size		
	a) Small	7(23.3)	20(28.6)
	b) Medium	18(60)	26(37.1)
	c) Large	5(16.7)	24(34.3)
C.	**Organization membership**		
	a) No membership	0	0
	b) Member of formal organization	30(100)	70(100)
	c) Office bearer of formal organization	30	0
	d) Member of non-formal organization	0	0
	e) Office bearer of non-formal organization	0	0

Table 3: Distribution of the SHGs members on the basis of economic variables

N=100

S. No.	Economic variables	Office bearer n=30 f(%)	Member n=70 f(%)
A	**Land holding**		
	a) No land	0	2(2.9)
	b) 1.0 to 2.5 acres	14(46.6)	32(45.7)
	c) 2.6 to 5.0 acres	5(16.7)	17(24.3)
	d) 5.1 to 10.0 acres	6(20)	11(15.7)
	e) More than 10 acres	5(16.7)	8(11.4)
B	**Housing**		
	a) Kutcha house	4(13.3)	10(14.3)
	b) Mixed house	6(20)	24(34.3)
	c) Pucca house	20(66.7)	36(51.4)
C	**Livestock ownership**		
	a) Small herd size	17(56.7)	45(64.3)
	b) Medium herd size	13(43.3)	21(30)
	c) Large herd size	0	4(5.7)
D	**Dwelling for livestock**		
	a) Open/nil	15(50)	25(35.7)
	b) Thatched/Kutcha	11(36.6)	36(51.4)
	c) Pucca	4(13.4)	9(12.9)

Table 4: Distribution of the SHGs members on the basis of media ownership among the respondents

N=100

Sr.	Media ownership	Office bearer n=30 f(%)	Member n=70 f(%)
a)	Newspaper/magazines	4(13.3)	18(25.7)
b)	Radio/transistor	1(3.3)	4(5.7)
c)	Television	25(83.4)	48(68.6)

Media ownership: Data in Table 4 show that majority of the office bearers (83.4 %) had television, 13.3 per cent respondents had subscribed newspaper/ magazines and few respondents (3.3 %) had radio/ transistor. Among members, majority of the respondents (68.6 %) had television, one fourth of the respondents (25.7 %) subscribed newspaper/ magazines and very few respondents (5.7 %) had radio/ transistor.

Ambedkar (2010) revealed that 28.34 per cent of the respondent had high school level of education followed by those who belonged to middle school 16.6 per cent, primary school 14.17, and collegiate education 12.50 per cent, illiterate 12.50 per cent, functionally literate 10.83 per cent, graduation 4.17 per cent and post-graduation 0.83 per cent respectively.

Socio economic status: On the basis of scores obtained by the respondents in the different aspects of socio-economic status scale, the respondents were categorized as high, medium and low socio-economic status. Data in Table 5 point out that majority of the office bearers (25%) were from mediumsocio-economic status, whereas only 5 per cent of the respondents had low socio-economic status. Among members, majority of the respondents (50 %) were from low socio-economic status and 20 per cent of the respondents had medium socio-economic status. None of the respondents had high socio economic status.

Table 5: Distribution of the SHGs members on the basis of their socio-economic status

N=100

S. No.	Socio Economic Status	Office bearer n=30 f(%)	Member n=70 f(%)
1	Low	5	50
2	Medium	25	20
3	High	0	0

CONCLUSION

On the basis of findings, it could be concluded that out of total 30 office bearers, more than half of the SHGs members (60%) belongs to lower middle age group (31-45 years) and out of 70 members, less than half of the office bearers (48.6 %) were from young age group. Majority of the office bearers (93.3 %) and 85.7 per cent members were married. More than half of the office bearers (56.6 %) and 57.2 per cent members were engaged in farming. Less than half of

the office bearers (46.7 %) were educated upto primary school and majority of the members (61.4%) were illiterate and can read and write. Both of the majority had television. Majority of the office bearers(25 %) were from mediumsocio-economic status. Among members, majority of the respondents (50 %) were from lowsocio-economic status.

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CORRELATION BETWEEN SOCIO-PERSONAL, PSYCHOLOGICAL & SITUATIONAL CHARACTERISTICS AND LEVEL OF KNOWLEDGE ABOUT PADDY PRODUCTION TECHNOLOGY

Sumit Rajendra Salunkhe*

ABSTRACT

Rice, wheat, and maize are the three leading food crops in the world; together they directly supply more than 50 per cent of all calories consumed by the entire human population. Rice provides 21 per cent of global human per capita energy and 15 per cent of per capita protein. Although rice protein ranks high in nutritional quality among cereals, protein content is modest. Rice also provides minerals, vitamins, and fiber, although all constituents except carbohydrates are reduced by milling. An ex-post facto research design was used in present investigation. The study was confined to all five talukas of Navsari district. The five villages from each taluka having highest area under Gurjari variety were identified. From each village 10 samples were randomly drawn. In this way, 50 respondents were selected from five talukas and thus, the sample size for the study comprised of 250 respondents. Fifteen independent and two dependent variables were taken for the study. The knowledge measured with the help of structured schedule and adoption scale was developed. The collected data were analyzed by using appropriate method of analysis viz., percentage, mean, rank, t value, standard deviation and correlation coefficient.

INTRODUCTION

Paddy is the major staple food for the people of Asian countries and two third of world. It is grown in 152 million hectors in the world and produces 586 million tons. The major growing countries are China, India, Indonesia, Bangladesh, Thailand, Japan, Pakistan, Burma and Brazil. (Anonymous, 2012-13). India stands first in area and second in production and consumption of rice next to China. The farmers of South Gujarat are growing drilled as well as transplanted paddy which covers 45 per cent area of Gujarat. The productivity of drilled paddy is about 1.2 tons / hectare and transplanted is about 2.2 to 2.5 tons / hectare. Navsari district has been considered as rice bowl of South Gujarat. It is cultivated in 42.5 thousand hectares and total production is 102.6 tones with 2410 kg / ha productivity (Anon., 2013). The challenges faced by countries as regard to paddy production differs from one country to other in terms of population, their preference attached to the commodity as well as diet of household menu, natural endowment to increase production and the productivity. Considering all these, the annual production needs to be increased from 586 to 756 million metric tons by 2030.

METHODOLOGY

For the present investigation, an ex-post facto research design was used. The study was confined to all five talukas of Navsari district. The five villages from each taluka having highest area under Gurjari variety were identified. The lists of paddy growers was obtained from each talati-cum-mantri and out of them the growers who were growing Gurjari variety since last five years were separated. A simple random sampling method was used to select the respondents for the present study. Form each village 10 sample was randomly drawn. In this way, 50 respondents were selected from five villages of one taluka. Thus, the sample size for the study comprised of 250 respondents. Fifteen independent and two dependent variables were taken for the study. The knowledge measured with the help of structured schedule. The collected data were analyzed by using appropriate method of analysis viz., percentage, mean, rank, t value, standard deviation and correlation coefficient.

RESULTS AND DISCUSSION

Correlation between Personal Profile and Level of Knowledge about Paddy Production Technology: The

*Assistant Professor, polytechnic in agriculture, NAU, Navsari-Gujarat, Sumitsalunkhe45@rediffmail.com/9921398237

association between the personal profile of the paddy growers viz., age, education, occupation, innovativeness, risk orientation, scientific orientation, overall modernity, land holding, annual incomes, social participation, size of family, management orientation, economic motivation, farming experience, information input and processing behaviour and level of knowledge were worked out by using coefficient of correlation. The findings are presented in Table 1.

Knowledge is refers as a product of education. Knowledge about subject is normally referred as an individual "aware about or know how about". Considering the importance of level of knowledge the correlation coefficient were calculated with the personal profile of the Gurjari growers.

Table 1: Correlation between personal profile and level of knowledge of Gurjari growers about paddy production technology

(n=250)

Sr.	Personal characteristics	'r' value
1.	Age	0.1450*
2.	Education	0.2256**
3.	Occupation	0.1179
4.	Annual income	0.2533**
5.	Size of land holding	0.3079**
6.	Social participation	0.0063
7.	Family size	0.2325**
8.	Economic motivation	0.2454**
9.	Risk orientation	- 0.1195
10.	Scientific orientation	0.3128**
11.	Innovativeness	0.3436**
12.	Management orientation	0.2393**
13.	Overall modernity	0.2180**
14.	Farming experience	0.2122**
15.	Information input and processing behavior	0.1454*

* Significant at 0.05 level, ** Significant at 0.01 level

1.1 Age and level of knowledge : The data presented in Table 1 shows that the calculated value of correlation coefficient (0.1450*) was found positively significant. It indicates that there was an association between age and level of knowledge of the Gurjari growers.

Hence, the null hypothesis (Ho_1.1) was rejected. This might be due to their young age and level of faming experience.

1.2 Education and level of knowledge : It is evident from Table 1 shows that the calculated value of correlation coefficient (0.2256**) was found positively and highly significant. It indicates that there was an association between education and level of knowledge of the Gurjari growers.

Hence, the null hypothesis (Ho_1.2) was rejected. The level of education might be confirms the grower about required importance information about paddy crop cultivation.

1.3 Occupation and level of knowledge : It is apparent from the Table 1 specify that the calculated value of correlation coefficient (0.1179) was found non-significant. It indicates that there was no association between occupation and level of knowledge of the Gurjari growers.

Hence, null hypothesis (Ho_1.3) was accepted.

1.4 Annual income and level of knowledge : The numerical figures of Table 1 shows that the calculated value of correlation coefficient (0.2533**) was found positively and highly significant. It indicates that there was an association between annual income and level of knowledge of the Gurjari growers.

Hence, null hypothesis (Ho_1.4) was rejected. The possible reason might be that the Gurjari growers had better understanding about economically adoptable package of practices and its applicability in their field.

1.5 Size of land holding and level of knowledge : The data presented in same table shows that the calculated value of correlation coefficient (0.3079**) was found positively and highly significant. It indicates that there was an association between size of land holding and level of knowledge of the Gurjari growers.

Hence, null hypothesis (Ho_1.5) was rejected. The probable reason for this might be that the Gurjari growers possessed knowledge about to adopt new technology in proportion to their land holding.

1.6 Social participation and level of knowledge : The data given in Table 1 specify that the calculated value of correlation coefficient (0.0063) was found non-significant. It indicates that there was no association between social participation and level of knowledge of the Gurjari growers.

Hence, null hypothesis (Ho_1.6) was accepted.

1.7 Size of family and level of knowledge : It is observed from Table 1 that the calculated value of correlation coefficient (0.2325**) was found positively and highly significant. It indicates that there was an association between size of family and level of knowledge of the Gurjari growers.

Hence, null hypothesis (Ho_1.7) was rejected. This infers that the more number of members in family resulted in better opportunity to avail critical information about various paddy production technology.

1.8 Economic motivation and level of knowledge: Further, same table shows that the calculated value of correlation coefficient (0.2454**) was found positively and highly significant. It indicates that there was an association between economic motivation and level of knowledge of the Gurjari growers.

Hence, null hypothesis (Ho_1.8) was rejected. It proves that the several motivational factors work in adoption of paddy production technology but, how fare to their economical aspects the paddy growers might be possessed ample knowledge.

1.9 Risk orientation and level of knowledge : It is evident from the data reported in Table 1 that the calculated value of correlation coefficient (-0.1195) was found negative and non-significant. It indicates that there was no association between risk orientation and level of knowledge of the Gurjari growers.

Hence, null hypothesis (Ho_1.9) was accepted.

1.10 Scientific orientation and level of knowledge: It can be seen from Table 1 that the calculated value of correlation coefficient (0.3128**) was found positively and highly significant. It indicates that there was an association between scientific orientation and level of knowledge of the Gurjari growers.

Hence, null hypothesis (Ho_1.10) was rejected. The finding might be due to their level of education, length of farming experiences and affinity towards scientific cultivation of paddy production technology.

1.11 Innovativeness and level of knowledge : It is clear from the Table 1 that the calculated value of correlation coefficient (0.3436**) was found positively and highly significant. It indicates that there was an association between innovativeness and level of knowledge of the Gurjari growers.

Hence, null hypothesis (Ho_1.11) was rejected. This finding might be due to inborn nature Gurjari growers.

1.12 Management orientation and level of knowledge : It is apparent from the data presented in the Table 1 that the calculated value of correlation coefficient (0.2393*) was found positively and highly significant. It indicates that there was an association between management orientation and level of knowledge of the Gurjari growers.

Hence, null hypothesis (Ho_1.12) was rejected. The probable reason of this finding might be due to their length of faming experiences of cultivating the paddy crop and secondary level of education.

1.13 Overall modernity and level of knowledge : As reveal from data presented in Table 1 that the calculated value of correlation coefficient (0.2180*) was found positively and highly significant. It indicates that there was an association between overall modernity and level of knowledge of the Gurjari growers.

Hence, null hypothesis (Ho_1.13) was rejected. The probable reason of this finding might be due to their outlook, openness and behaviour to adopt new inputs to get higher production in paddy crop.

1.14 Farming Experience and level of knowledge: Table 1 shows that the calculated value of correlation coefficient (0.2122*) was found positively and highly significant. It indicates that there was an association between farming experience and level of knowledge of the Gurjari growers.

Hence, null hypothesis (Ho_1.14) was rejected. This finding might be due to their hereditarily adopted

occupation, moderate level of input use behaviour and active social participation.

1.15 Information input and processing behavior and level of knowledge : The data presented in Table 1 specify that the calculated value of correlation coefficient (0.1454*) was found positively significant. It indicates that there was an association between information input and processing behavior and level of knowledge of the Gurjari growers.

Hence, null hypothesis (Ho_1.15) was rejected. This finding might be due to easy accessibility of different information sources from public and private agencies, processing ability of information about critical input and highest number of poha factories.

This finding is in conformity with the findings of Rahman (2002), Prakash et al. (2003), Bankar (2004), Mate (2005), Khalge et al. (2008), Bhosale (2010), Patil (2011), Chaudhari (2012) and Singh and Pandey (2013)

CONCLUSION

From the above discussion it can be concluded that age and information input and processing behavior of the Gurjari growers found positively and significantly associated with their knowledge about paddy production technology, while education, annual income, size of land holding, family size, economic motivation, scientific orientation, innovativeness, management orientation, overall modernity and farming experience found positive and highly significantly correlated with their knowledge regarding paddy production technology.

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CHANGING PATTERN OF SUSTAINABLE LIVELIHOOD SYSTEMS AMONG THE TRIBALS IN SOUTHERN RAJASTHAN

Yogita Ranawat* and S.S. Sisodia**

ABSTRACT

Tribals are amongst the weakest sections of the society. Tribal Sub-Plan (TSP) a strategic policy initiative to secure overall development of STs' was first introduced in the Fifth Five Year Plan. The present study was conducted in two districts, namely, Banswara and Dungarpur of southern Rajasthan, having highest per cent of tribals in the state. Two tehsils, namely, Banswara and Dungarpur were selected for this study. The study was undertaken in 10 villages of selected tehsils. First five villages of both the districts based on highest population were drawn up and included for the investigation. Total respondents included in the study were 150, out of which 75 were male and 75 female TSP beneficiaries. Finding revealed that more number of male respondents have adopted crops only and female respondents have adopted crop + livestock and both assigned 1st rank. But male had adopted crop + poultry and female crop + vegetable cultivation + orchard + livestock to the least extent.

INTRODUCTION

Socio- economic upliftment programmes of tribal cannot be ignored while planning agriculture and other development programmes of the country as tribal population of the country constitute 7.83 per cent of the total population. Tribals are amongst the weakest sections of the society. Tribal people are working hard in farming but due to unfertile and un-even land, lack of irrigation facilities, traditional methods of agriculture, illiteracy and poverty they are getting low income from farming as compared to other groups of people making it difficult for them to maintain their family need and living standard forcing them for other occupations like, agriculture labour, construction work and seasonal works.

Tribal Sub-Plan (TSP) a strategic policy initiative to secure overall development of STs was first introduced in the Fifth Five Year Plan. The focus of TSP is on securing budgetary allocations for tribal development at least proportionate to their population in order to bring them at par with other sections of society and to protect them from exploitation. With the fast developing world, tribal's required specific attention not only with monetary allocation but along with special interventions for their rapid socio-economic development through integrated approach of all departments in a united manner. The Tribal Sub-Plan envisage reducing gap between the tribals and non-tribals in health, education, communication and other areas of basic amenities of life by providing legal and administrative support. The Sub-Plan also implements income generating schemes to boost income of the tribals on a sustainable basis by taking into account their aptitude and skill.

RESEARCH METHODOLOGY

The present study was conducted in two districts, namely, Banswara and Dungarpur of southern Rajasthan, having highest percentage of tribals in the state. Two tehsils namely, Banswara and Dungarpur were selected for this study. The study was undertaken in 10 villages of selected tehsils. First five villages of both the districts based on highest population were drawn up and included for the investigation.

Total respondents included in the study were 150, out of which 75 were male and 75 female TSP beneficiaries. Proportionate random sampling technique was employed for the selection of respondents. Thereafter data were collected and interpreted in light of the objectives of the study.

* Ph.D. Student, Department of Extension Education, Rajasthan College of Agriculture, MPUAT, Udaipur.
** Head & Professor, Department of Extension Education, Rajasthan College of Agriculture, MPUAT, Udaipur.

RESULTS AND DISCUSSION

The changing pattern of livelihood system among male and female respondents were measured in terms of Mean Percent Score (MPS). Three livelihood systems i.e. farming, non- farming and migration system were included to assess the changing pattern among tribals.

Farming System among the Tribals in TSP area: Data of Table 1 show that more number of male respondents have adopted farming system i.e. crops only, crop + vegetable cultivation and crop + livestock with 25.33, 20.00 and 14.67 MPS, respectively.

Respondent's response was good towards farming system like crop + vegetable cultivation + orchard and crop + vegetable cultivation + livestock with 13.33 and 10.67 MPS. But the farming systems of crop + vegetable cultivation + orchard + livestock and crop + poultry were adopted to least extent.

Table 1 further shows that female respondents have adopted crop + livestock, crops only and crop + vegetable cultivation + livestock with 28.00, 18.67 and 17.33 MPS, respectively. Women also adopted the farming system as crop + vegetable cultivation and crop + vegetable cultivation + orchard with 12.00 and 09.33 MPS, respectively. Crop + poultry and crop + vegetable cultivation + orchard + livestock were least adopted by women respondents.

Table 1 depict that both male and female respondents had dominantly adopted farming system i.e. crops only and crop + livestock with 22.00 and 21.34 MPS, respectively. Majority of tribals have adopted crop + vegetable cultivation, crop + vegetable cultivation + livestock and crop + vegetable cultivation + orchard with 16.00, 14.00 and 11.33 MPS, respectively. But they had least adopted crop + vegetable cultivation + orchard + livestock and crop + poultry.

The value of rank order correlation (rs) was 0.72 which indicates positive correlation between male and female respondents.

Non-Farming System among the Tribals in TSP area: Due to uncertainty of monsoon, irratic rainfall and frequent recurrence of drought the tribals have adopted a number of non-farming occupations to strengthen their family income.

The data of Table 2 further show that male respondents have adopted non-farming activities like shopkeeping, photocopy work, plumbing & sanitary fitting, electric house wiring and fruit & vegetable processing with 56.00, 54.67, 49.33, 44.00 and 40.00 MPS, respectively. Male respondent's have adopted automobile mechanic, welding work, agro-service centre, craftsman and artisan with 32.00, 30.67, 26.67, 22.67 and 21.33 MPS, respectively. Male respondents have less adopted stitching garments, embroidery, carpet & basket making and manihari shop.

Data of Table 2 reveal that female respondents

Table 1: Farming system among the Tribal in TSP area

S. No.	Aspect	Male (n = 75)		Female (n = 75)		Total (n = 150)	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Crops only	25.33	1	18.67	2	22.00	1
2.	Crop + Vegetable Cultivation	20.00	2	12.00	4	16.00	3
3.	Crop + Vegetable Cultivation + Orchard	13.33	4	09.33	5	11.33	5
4	Crop + Livestock	14.67	3	28.00	1	21.34	2
5.	Crop + Vegetable Cultivation + Livestock	10.67	5	17.33	3	14.00	4
6	Crop + Vegetable Cultivation + Orchard + Livestock	09.33	6	06.67	7	08.00	6
7	Crop + Poultry	06.67	7	08.00	6	07.34	7

MPS= mean percent score, n = number of respondents rs = 0.72*

Table 2: Non-farming activities among the Tribal in TSP area

S. No.	Aspects	Male (n = 75)		Female (n = 75)		Total (n = 150)	
		MPS	Rank	MPS	Rank	MPS	Rank
1	Shopkeeping	56.00	1	53.33	1	54.67	1
2	Agro-service centre	26.67	8	28.00	7	27.34	9
3	Automobile mechanic	32.00	6	09.33	14	20.67	13
4	Electric house wiring	44.00	4	12.00	13	38.33	3
5	Welding work	30.67	7	14.67	12	22.67	11
6	Plumbing & Sanitary fitting	49.33	3	16.00	11	32.67	6
7	Embroidery	14.67	12	41.33	4	28.00	8
8	Stitching garments	17.33	11	52.00	2	34.67	5
9	Fruit & Vegetable processing	40.00	5	31.25	6	35.63	4
10	Photocopy work	54.67	2	24.00	8	42.00	2
11	Manihari shop	10.67	14	46.67	3	28.67	7
12	Craftsman	22.67	9	21.33	9	22.00	12
13	Artisan	21.33	10	18.67	10	20.00	14
14	Carpet & Basket making	13.33	13	36.00	5	24.67	10

MPS= mean percent score, n = number of respondents

rs = 0.30NS

were happy as they were getting new job opportunities like shopkeeping, stitching garments, manihari shop, embroidery with 53.33, 52.00, 46.67 and 41.33 MPS, respectively. Good number of respondents had livelihood security from practices like carpet & basket making, fruit & vegetable processing, agro-service centre, photocopy work and craftsman with 36.00, 31.25, 28.00, 24.00 and 21.33 MPS, respectively. Female respondents have less adopted artisan, plumbing & sanitary fitting, welding work, electric house wiring, and automobile mechanic with 18.67,16.00, 14.67,12.00 and 09.33 MPS, respectively.

Data in Table 2 show that both male and female respondents after implementation of TSP activities parameters like shopkeeping and photocopy work (54.67 and 42.00 MPS, respectively) have improved livelihood of tribal respondents. The table also reveals that livelihood condition was improved by adoption of electric house wiring, fruit & vegetable processing, stitching garments and plumbing & sanitary fitting, respectively. But they have least diversification in automobile mechanic and artisan with 20.67 and 20.00 MPS, respectively.

The value of rank order correlation (r_s) was 0.30. The value of "r_s" for the male and female categories of respondents was found non-significant which leads to the conclusion that there is difference in realization of non-farming system between beneficiary and non-beneficiary maize growers.

Migration System among the Tribals in TSP area: Table 3 depicts that two types of migration observed among tribal in Dungarpur and Banswara district. The seasonal (1-6 months) migration was maximum i.e. 78.67 MPS. Temporary migration (>12 months) is mainly due to effect of urbanization and also for push and pull factors of migration with 21.33 MPS.

It is clearly seen from Table 3 that seasonal migration was more than temporary migration among male and female respondents.

This findings supported by Breman (1996) reported that seasonal migration for employment in India is growing both in terms of absolute numbers

and also in relation to size of working population as a whole. Similar findings have also been supported by Sharma *et al*. (2012).

Table 3: Nature of migration in TSP area

Sr.	Nature of Migration	Male (n = 75)		Female (n = 75)		Total (n = 150)	
		MPS	Rank	MPS	Rank	MPS	Rank
1	Seasonal	77.33	1	80.00	1	78.67	1
2	Temporary	22.67	2	20.00	2	21.33	2

MPS= mean percent score, n = number of respondents

Type of migration in TSP area : Table 4 disclosed that male respondents among types of migration (based on distance) interstate migration is maximum due to high labour charges and thereby higher income with 33.33 MPS. The intra and inter district migration is more with 29.33 and 26.67 MPS, respectively. Migration to abroad countries (mainly to Kuwait) occurs due to better opportunities and higher income of wage workers i.e. 10.67 MPS.

Table 4: Type of migration in TSP area

Sr.	Type of Migration	Male (n = 75)		Female (n = 75)		Total (n = 150)	
		MPS	Rank	MPS	Rank	MPS	Rank
1	Intra district	29.33	2	41.33	1	35.33	1
2	Inter district	26.67	3	28.00	2	27.34	2
3	Inter state	33.33	1	22.67	3	26.00	3
4	Abroad	10.67	4	08.00	4	09.33	4

rs=0.70*

MPS= mean percent score, n = number of respondents

Data in Table 4 reveal that female respondents were intra district migration is maximum with 41.33 MPS. Female respondents migrated inter district and inter-state with 28.00 and 22.67 MPS, respectively. They were less migrated to abroad countries (mainly to Kuwait).

Table 4 further reveals that even after implementation of TSP programme migration of tribal respondents to intra district was recorded with 35.33 MPS. They also migrate to inter district and interstate with 27.34 and 26.00 MPS for better wages, respectively. Migration to abroad countries (mainly to Kuwait) was less with 9.33 MPS.

An effort was also made to find out the relationship in perception of type of migration in TSP area between male and female respondents. The value of rank order correlation rs was 0.70. It indicates positive correlation.

CONCLUSION

Farming system that more number of male respondents have adopted crops only and female respondents have adopted crop + livestock and both assigned 1st rank. But male had least adoption crop + poultry and female had least adopted crop + vegetable cultivation + orchard + livestock. Non-farming system male respondents have adopted non-farming systems like shopkeeping, photocopy STD-PCO work, plumbing & sanitary fitting, electric house wiring and fruit & vegetable processing with 56.00, 54.67, 49.33, 44.00 and 40.00 MPS, respectively. Whereas, female respondents were happy as they were getting new job opportunities like shopkeeping, stitching garments, manihari shop, embroidery with 53.33, 52.00, 46.67 and 41.33 MPS, respectively. The implementation of TSP programme decreases the migration of tribal respondents as male, female and children with 56.00, 29.34 and 27.33 MPS, respectively. Seasonal migration was more than permanent migration among male and female respondents. Intra district was recorded with 35.33 MPS. They also migrate to inter district and interstate with 27.34 and 26.00 MPS for better wages, respectively. Migration to abroad countries (mainly to Kuwait) was less with 9.33 MPS.

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EFFECT OF INTERNET UTILIZATION AMONG AGRICULTURAL RESEARCH SCHOLARS IN MPUAT, UDAIPUR (RAJASTHAN)

L.R. Choudhary* and B.S. Bhimawat**

ABSTRACT

Internet has become a way of life for majority of higher education students all around the world. For most university and college students, the internet is a functional tool, one that has greatly changed the way they interact with each other and with information as they go about their studies. Considering the importance of the internet utilization the present investigation "Attitude and Utilization Pattern of Internet among the Research Scholars of Agriculture Science in MPUAT, Udaipur (Rajasthan).

INTRODUCTION

The Internet has reshaped the way we communicate, work, play and how we understand the world around us. With the rise of the Internet as a digital highway for messages and images, people now have a fast, convenient and reliable means to transmit and receive information. Internet use is spreading rapidly into daily life and has an impact in many areas including the higher education system. Internet heralded the development and implementation of new and innovative teaching strategies in higher education institutions. Educators who advocate technology integration in learning process believe that it will improve learning and prepare students to effectively participate in the 21st century workplace. It is now widely used as a research tool for news, education, entertainment and informal web-based education. Looking to the importance of internet of in various fields the present study was undertaken with specific objective entitled “to study the effect of internet utilization among Agricultural Research Scholars of MPUAT, Udaipur.

RESEARCH METHODOLOGY

The study was purposively conducted in Rajasthan College of Agriculture. Udaipur due to the reason that this College is the oldest Agricultural College in Rajasthan state and enjoys more and adequate facilities of internet surfing for agricultural students, especially for research scholars at central library as well as in their respective departments and Hostels as compared to other Agricultural Colleges in Rajasthan.

From the RCA, Udaipur, a list of all the PG and Ph.D. research scholars was prepared from the student section of the college. There were 150 PG and 110 Ph. D research scholars, i.e. a total of 260 research scholars were registered in second semester during the session 2011-12. Out of which a sample of 117 respondents (90 male and 27 female) was taken for the study.

RESULTS AND DISCUSSION

1. Effect of internet use on academic performance of the agricultural research scholars : The data presented in Table 1 indicate that among the different academic performances the 'Internet services facilitate improvement in systems of communication' was perceived as the most important effect on the academic performance of the male agricultural students (MPS 90.00) and female agricultural students (MPS 87.41) and was accorded first rank. The 'Internet facilitates to retrieve latest information through number of sources found' was perceived as the second most important effect on the academic performance of the male agricultural students (MPS 88.89) and female agricultural students (MPS 85.19) and was accorded second rank and third rank, respectively

On the other hand 'Due to Internet usage, there is a decrease in actual study- hours and live discussions

*Ph.D Student, Department of Extension Education Rajasthan College of Agricultural, Udaipur (Raj.)
**Director, Directorate of Extension Education, Agricultural University, Jodhpur

Table 1: Effect of internet utilization on the academic performance of the male and female agricultural research scholars

n = 117

S. No.	Particulars	Male agriculture research scholars (n =90)							Female agricultural research scholars (n=27)						
		SA (5)	A (4)	N (3)	DA (2)	SDA (1)	MPS	Rank	SA (5)	A (4)	N (3)	DA (2)	SDA (1)	MPS	Rank
1.	Internet facilitates to retrieve latest information through number of sources found	46 (51.11)	39 (43.33)	4 (4.44)	1 (1.11)	0 (0.00)	88.89	II	13 (48.15)	10 (37.04)	2 (7.41)	2 (7.41)	0 (0.00)	85.19	III
2	Due to Internet usage, there is a decrease in actual study-hours and live discussions with friends	13 (14.44)	16 (17.78)	21 (23.33)	34 (37.82)	5 (5.56)	58.89	IX	3 (11.11)	6 (22.22)	5 (18.52)	11 (40.74)	2 (7.41)	57.29	IX
3	Internet facilitates saving in terms of time and energy looking for information	43 (47.78)	42 (46.67)	3 (3.33)	2 (2.22)	0 (0.00)	87.33	III	13 (48.15)	12 (44.44)	1 (3.70)	1 (3.70)	0 (0.00)	87.41	I
4	Internet services are cost-effective	23 (24.56)	44 (48.89)	17 (18.89)	4 (4.44)	2 (2.22)	78.22	V	5 (18.52)	13 (48.15)	5 (18.52)	2 (7.41)	2 (7.41)	72.59	VI
5	Due to Internet usage there is a decrease in frequency of reading printed materials like books, journals, news papers, etc	9 (10.00)	24 (26.67)	18 (20.00)	31 (34.44)	8 (8.89)	58.89	IX	5 (18.52)	7 (25.93)	3 (11.11)	9 (33.33)	3 (11.11)	61.48	VIII
6	Internet services facilitate improve-ment in systems of communication	49 (54.44)	37 (41.11)	4 (4.44)	0 (0.00)	0 (0.00)	90.00	I	13 (48.15)	11 (40.04)	3 (11.11)	0 (0.00)	0 (0.00)	87.41	I
7	The Internet had a positive impact on academic zexperience in general	37 (41.11)	41 (45.56)	10 (11.11)	2 (2.22)	0 (0.00)	85.11	IV	11 (40.74)	10 (37.04)	4 (14.81)	2 (7.41)	0 (0.00)	82.22	IV
8	Due to Internet usage there is a decrease in frequency of visit to library as well as preparation of hand-written notes.	16 (17.78)	27 (30.00)	9 (10.00)	31 (34.44)	7 (7.78)	63.11	VIII	5 (18.52)	6 (22.22)	5 (18.52)	6 (22.22)	5 (18.52)	60.00	IX
9	Internet improved the professional competence of the students	18 (20.00)	18 (20.00)	20 (22.22)	27 (30.00)	7 (7.78)	62.89	VII	5 (87.52)	6 (22.22)	5 (18.52)	10 (37.04)	1 (3.70)	62.96	VII
10	Internet expedited the research process conducted by the students	31 (34.44)	25 (27.78)	19 (21.11)	15 (16.67)	0 (0.00)	76.00	VI	9 (33.33)	8 (29.63)	6 (22.22)	4 (14.81)	0 (0.00)	77.30	V

rs = 0.93750** t = 6.59912 rs = Rank correlation **significant at 1% level of significance

SA = Strongly agree; A= Agree, N=Netural; DA= Disagree; SDA=Strongly disagree

Figures in parenthesis indicate percentage

Table 2: Effect of internet utilization on the non academic performance of the male and female agricultural research scholars

n=117

S. No.	Particulars	Male agriculture research scholars (n =90)							Female agricultural research scholars (n=27)						
		SA (5)	A (4)	N (3)	DA (2)	SDA (1)	MPS	Rank	SA (5)	A (4)	N (3)	DA (2)	SDA (1)	MPS	Rank
1	Internet services facilitate to maintain a wide circle of friends	34 (37.78)	43 (47.78)	7 (7.78)	5 (5.56)	1 (1.11)	83.11	I	8 (29.63)	14 (51.85)	3 (11.11)	0 (0.00)	2 (7.41)	79.26	I
2	Internet use disturbs the "live" social interaction with friends	4 (4.44)	23 (25.56)	10 (11.11)	45 (50.00)	8 (8.89)	53.33	IV	2 (7.41)	5 (18.52)	3 (11.11)	14 (57.85)	3 (11.11)	51.85	V
3	Due to Internet use, there is a decrease in my participation in the extra curricular activities at the college/university level	3 (3.33)	13 (14.44)	9 (10.00)	60 (66.67)	5 (5.56)	48.67	VI	1 (3.70)	5 (18.52)	3 (11.11)	15 (55.56)	3 (11.11)	49.63	VI
4	Due to Internet use, I get health-related problems like eye-pain, back-pain neck-pain and head ache, etc.	9 (10.00)	25 (27.78)	15 (16.67)	32 (35.56)	9 (10.00)	58.44	III	4 (14.82)	9 (32.33)	5 (18.52)	6 (22.22)	3 (11.11)	63.70	II
5	Internet use has disturbed my sleeping-pattern erratically.	5 (5.56)	19 (21.11)	14 (15.56)	47 (52.22)	5 (5.56)	53.78	IV	2 (7.41)	5 (18.52)	5 (18.52)	13 (48.15)	2 (7.41)	54.07	IV
6	Internet use has increased my depen-dency on Internet	18 (20.00)	28 (31.11)	9 (10.00)	25 (27.78)	10 (11.11)	64.22	II	7 (25.93)	6 (22.22)	2 (7.41)	6 (22.22)	6 (22.22)	61.48	III

rs = 0.98214** t = 10.44074 rs = Rank correlation **significant at 1% level of significance

SA = Strongly agree; A= Agree, N=Netural; DA= Disagree; SDA=Strongly disagree

Figures in parenthesis indicate percentage

with friends' was the least perceived effect on the academic performance of the male agricultural students (MPS 58.89) as well as female agricultural students (MPS 57.29) and was accorded last rank by both male and female agricultural research scholars.

The value of rank order correlation (r_s) between male and female agricultural students, was found to be 0.93 for which the calculated value of 't' were found higher than the tabulated value at 1 per cent level of significance which indicates a positive and highly significant correlation between the effect internet on the academic performance the male and female agricultural students. Hence, the null hypothesis was therefore rejected and alternate hypothesis was accepted. This leads to the conclusion that there is a highly significant correlation between the effect of internet on the academic performance of the agricultural research scholars.

2. Effect of internet use on non academic performance of the agricultural research scholars: The data presented in Table 2 reveal that among the different non academic performances the 'Internet services facilitate to maintain a wide circle of friends' was perceived as the most important effect on the non-academic performance of the male agricultural students (MPS 83.11) and female agricultural students (MPS 79.11) and was accorded first rank. The 'Internet use has increased dependency on Internet' was perceived as the second most important effect on the non-academic performance of the male agricultural students (MPS 64.22) and female agricultural students (MPS 64.43) and was accorded second and third rank, respectively

On the other hand 'Due to Internet use, there is a decrease in participation in the extra- curricular activities at the college/ university level' was the least perceived non academic performance by the male agricultural students (MPS 48.67) as well as by the female agricultural students (MPS 49.63) and was accorded last rank by both categories of respondents.

The value of rank order correlation (r_s) between male and female agricultural students, was found to be 0.98 for which the calculated value of 't' was found higher than the tabulated value at 1 per cent level of significance which indicates a positive and highly significant correlation between male and female agricultural students Hence, the null hypotheses (Ho3.2) were, therefore rejected and alternate hypotheses were accepted. This leads to the conclusion that there is a highly significant correlation between the internet utilizing male and female agricultural research scholars in perceiving the effect of non academic performances.

From the data presented in Table 1 it can be concluded that majority of the internet utilizing male and female agricultural research scholars perceived that the "internet services facilitate improvement in systems of communication" as the most important effect on the academic performance and the "internet services facilitate to maintain a wide circle of friends" as the most important effect on the non-academic performance.

CONCLUSION

Majority of the internet utilizing male and female agricultural research scholars perceived that the "internet services facilitate improvement in systems of communication" as the most important effect on the academic performance and the "internet services facilitate to maintain a wide circle of friends" as the most important effect on the non-academic performance.

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IMPACT OF FRONT LINE DEMONSTRATIONS ON USE OF UREA MOLASSES MINERAL BRICKS IN DAUSA DISTRICT (RAJASTHAN)

R.A. Sharma* and R.N. Sharma**

ABSTRACT

The front line demonstration trials were conducted in Moradi and Peechupada villages in Bandikui block, Reta village in Sikrai block and different villages in Lalsot block of Dausa district during the year 2006-07 to 2010-11. The overall percent increase of milk production was 13.24%. In case of extension gap it was highest in Khatwa, Shahapura and Kishanpura villages of Lalsot block (0.930) and the lowest (0.541) in Reta village of Sikarai block in Dausa district. Overall adoption of technology was 60.53 percent during the reporting period. While the overall average percent milk production, extension gap in liters, adoption percent were 13.24, 0.742 and 60.53, respectively. The evaluation shows that the front line demonstration trails found better (31.33%) in terms of net return than farmers' practice (no use of UMMB) for increase in milk production of dairy animals in Dausa District. Across the years front line demonstrations were found higher additional return percentage ranging from Rs. 473.20 to 664.50 per month with overall Rs. 497.13per month and higher additional BC ratio was ranging from 12.32 to 20.13 (overall 16.23). The BC ratio indicates that the technology of UMMB is highly profitable.

INTRODUCTION

Dausa district falls in Agro climatic zone IIIa namely "Semi Arid Eastern Plains" covering Dausa, Ajmer, Tonk and Jaipur districts. The technologies generated by scientists of Animal Production were tested and disseminated through front line demonstrations to livestock keepers of Dausa district. Livestock play an important role in agrarian economy in India and so more in Dausa district. Feeding management is probably one of the important needs, because currently the country is facing a wide gap between demand and availability of nutrients. The whole gamut of the dairy industry as well as its lucratibility by and large depends upon the availability and type of feed being offered to the animals by dairy cattle owners. As about 70 -75% of the total cost of production is spent on feeding of livestock. Therefore judicious use of feed and fodder to the animals to meet their body requirement is essential. To make dairy farming profitable enterprise it is essential to reduce feeding cost of the animal and productivity of milch animals. The estimated population (in milking condition), milk production and productivity of buffalo in Dausa district was 105306, 231.993 thousand tons and 6.036 liters, respectively (Administrative Report of Directorate of Animal Husbandry, GOR, Year 2010-11). Keeping in view the importance of front line demonstration in Dausa district of Rajasthan in productivity enhancement and increasing the monetary returns, the present study was carried out.

RESEARCH METHODOLOGY

The present study was conducted on the milch buffaloes of Dausa district of Rajasthan during the consecutive four years from 2006-07 to 2010-11 except the year 2007-08. A total of 93 demonstrations having similar number of traditional practices were conducted on 93 milch animals in Dausa, Bandikui and Sikrai blocks of Dausa district of Rajasthan. The trainings were organized for benefitted livestock keepers by KVK scientists in respective years. The urea molasses bricks were used in demonstrations in all the villages from the year 2006-07 to 2010-11. The front line demonstration trials were conducted in Moradi and Peechupada villages in Bandikui block, Reta village in Sikrai block and different villages in Lalsot block of Dausa district. In front line demonstrations especial emphasis was given to proper use of UMMB in milch buffalo ration. The average milk production

*Professor (Animal Production) KVK, Dausa (Raj.) 303303
** Professor (Extension Education) KVK, Dausa (Raj.) 303303

of front line demonstration before treatment and during treatment was compared to evaluate the percent increase in milk production of milch buffaloes in respective years. The villages were selected on the basis of personal contact with livestock keeper and during the visit of farmer at KVK, where the UMMB was not used by the live stock keepers and selected milch buffaloes had same lactation, parity and 350-400 Kg. body weight. Livestock keepers were selected purposively.

The production data and economics were recorded during peak time of lactation before treatment (Two month before) and during treatment (3 to 5 months of lactation period) and calculated average production and economics per month. The cross section data on before and after use of UMMB were calculated by simple statistics like cost of production per liter gross return, net return, additional cost, additional return and additional B:C ratio. The benefit cost ratio (B: C) was calculated dividing the gross monetary return by the total cost of production.

Extension gap and adoption percentage were calculated as follows :

Extension gap = (Demonstration for milk production) – (Farmers/Traditional milk production)

Adoption percentage = Ai/Ri × 100

Where;

Ai= Adoption score obtained by the livestock keepers

Ri= possible maximum score obtained by the livestock keepers

RESULTS AND DISCUSSION

Table1 indicated that increase of average milk production was highest (15.16%) in Peechupada village in year 2008-09 and lowest in Reta village in the year 2010-11. The overall percent increase of milk production was 13.24 per cent. According to the study of Hendratno (1997) UMMB supplementation caused a significant improvement in body condition and reproductive performance as well as an overall increase in milk production. Prasanna et.al (2009) also reported that probably feeding UMMB during 2nd and 3rd month of lactation has more influence on body weight of lambs due to higher milk yield of lactating ewes and CRIDA (2005) reported that in buffaloes it was observed that an average increase in 1.25 liter/day in milch yield was observed due to supplementation of UMMB during summer. In case of extension gap it was highest in Khatwa, Shahpura and Kishanpura villages of Lalsot block (0.930) and the lowest (0.541) in Reta village of Sikarai block in Dausa district. The overall extension gap was found 0.742 which shows that sufficient reason to popularize the technology by various agencies in Dausa district. The adoption percentage of technology (use of UMMB as feed supplement) was highest (65%) in Peechupada village and lowest (57.14%) in Reta village of Sikarai block in Dausa district and overall adoption of technology was 60.53 percent during the reporting period.

On the basis of Table 2 economics of various front line demonstrations on UMMB in different years, the highest percent increase in gross return Rs./buffalo was found 15.17 per cent in village Pichipada in the year 2008-09 followed by 14.36 per cent in village Moradi in the year 2006-07. Average percentage increase of gross return was found 13.10 per cent which is substantial for the farming community of Dausa district. The highest percent increase in net return was 43.63 per cent found in Peechupada village of Bandikui block in year 2008-09 followed by Reta village in Sikarai block (32.59) in year 2010-11, Moradi village in Bandikui block (30.62) in the year 2006-07 and different villages of Lalsot block (26.21) in year 2009-10 with the same technology given by KVK in Dausa district. Additional return was found highest (Rs. 664.5) in village Khatwa,Sahapura and Kishanpura in the year 2009-10 followed by village Moradi (Rs. 473.20) in the year 2006-07, while overall Rs. 497.13 per month / milch buffalo and higher additional BC ratio was ranging from 12.32 to 20.13 (overall 16.23). The feed cost per liter milk production was lower in UMMB supplemented milch buffalo ration due to improvement in digestibility of dry matter and its constituents. Nutrients intake is higher as compared to without UMMB supplemented milch buffalo ration. The similar findings were reported by Bilala and Murdiya (1996) study of supplementation of urea molasses mineral block to cross bred heifers. Tiwari *et al.* (1991), Talpanda *et al.* (1990) and Sahoo *et al.* (1991) also reported improvement in the digestibility

Table 1: Milk Production gap, extension gap and adoption index for UMMB in milch animal ration

Year	Name of Village	No. of demon-stration	No. of bene-ficiaries	Av. Milk production (Liter) per day/ animal		Percent increase in milk production	Extension gap	Adoption %
				Before Treatment		During Treatment		
2006-07	Moradi (Bandikui)	20	20	5.825	6.662	14.37	0.837	60
2008-09	Pichupada (Bandikui)	20	20	4.330	4.987	15.16	0.657	65
2009-10	Different villages-Khatwa, Sahapura,Kisanpura (Lalsot)	25	25	6.820	7.750	13.63	0.930	60
2010-11	Reta (Sikarai)	28	28	5.432	5.973	10.29	0.541	57.14
Total/Av.		**93**	**93**	**5.601**	**6.343**	**13.24**	**0.742**	**60.53**

Table 2: Economics of urea molasses mineral bricks demonstration (per month)

Year	Name of Village	No. of demon-stration	Total cost/ month (Rs)	Gross Return (Rs.)			Net Return (Rs.)			Addi-tional Cost (Rs.)	Addi-tional Return (Rs.)	Addi-tional B:C Ratio
				Be-fore Treat-ment	Du-ring Treat-ment	Per-cent incre-ase	Be-fore Treat-ment	Du-ring Treat-ment	Per-cent incre-ase			
2006-07	Moradi (Bandikui)	20	1979	3495	3997.2	14.36	1545	2018.2	30.62	29	473.20	16.31
2008-09	Pichupada (Bandikui)	20	2129	3117.6	3590.64	15.17	1017.6	1461.64	43.63	29	444.04	15.31
2009-10	Different villages-Khatwa,Shahapura, Kisanpura (Lalsot)	25	2613	5115	5812.5	13.63	2535	3199.5	26.21	33	664.5	20.13
2010-11	Reta (Sikarai)	28	3183	4398.3	4838.13	10.00	1248.3	1655.13	32.59	33	406.83	12.32
	Total/Average	**93**	**2476**	**4031.44**	**559.6**	**13.10**	**1586.47**	**2083.60**	**31.33**	**31**	**497.13**	**16.23**

of dry matter. The estimated population (in milking condition), milk production and productivity of buffalo in Dausa district was 105306, 231.993 thousand tons and 6.036 liters, respectively (Administrative Report of Directorate of Animal Husbandry, GOR, Year 2010-11). If the livestock keepers of Dausa district adopt the UMMB feed supplement as a low cost technology, the milk production of buffalo will be 262.70 thousand tons. It is assumed that if livestock keepers of Dausa district adopt UMMB technology as feed supplement in animal ration the overall additional return will be Rs. 62.76 crores annually. The additional BC ratio indicates that the technology of UMMB is highly profitable. Therefore front line demonstration technology is sufficient for production of milk and in

raising the living standard of farmers' community of Dausa district.

CONCLUSION

Front line demonstrations on use of urea molasses mineral bricks (UMMB) in milch animal ration of Dausa district was sufficiently found to increase production of milk and raising living standard of farmers' community of Dausa district. The overall net returns and B: C ratio indicated the conformity of results. It is required to narrow down the extension gap by educating the farmers' through KVK programmers' and thereby increasing the productivity of milk in Dausa district of Rajasthan.

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BODY MEASUREMENT AND PHYSIOLOGICAL PARAMETERS OF SONADI SHEEP DURING PREGNANCY IN FILD CONDITION

C.M. Yadav* and S. Mishra**

ABSTRACT

The data on body weights measurement (body length, height at withers, heart girth) and physiological parameters (rectal temperature and respiration rate) of 6208 registered Sonadi sheep maintained by 147 shepherds of eight tehsils of four districts of Sonadi breeding tract were recorded. The overall least- squares means for body weight of ewe varied significantly (P<0.05) from 33.13± 0.33 kg (non-pregnant mature animals) to 35.95±0.48 kg last months of first pregnancy. It was observed that body girth increases as pregnancy advanced. The results of physiological parameters indicated that body temperature ranged between 37.09 to 38.67ºC and respiration rate from 21.67 to 33.60/ minute during different stages of life in Sonadi sheep.

INTRODUCTION

Sonadi sheep is known for meat and carpet wool. It is fairly well built with long legs comparatively smaller than Malpura. Face is light brown in colour, which extend to the middle of the neck. Ears are large flate and drooping. Tail is long and thin. The information with respect to body weight, measurement and physiological parameter during pregnancy of Sonadi sheep reared in their breeding tract is scanty. Therefore, the present investigation was undertaken to record information on body measurement and physiological parameters of this breed during pregnancy in field condition.

RESEARCH METHODOLOGY

The major tract of Sonadi breed consists of Udaipur, Chittorgarh, Rajsamand and Dungarpur districts of Rajasthan, while the minor breeding tract consists of Bhilwara district of Rajasthan and part of north Gujarat (Acharya, 1982). The present study was conducted in four districts i.e. three districts namely Udaipur, Chittorgarh, Rajsamand from major and one Bhilwara from minor breeding tract of Sonadi sheep. The data on body weights and measurement (body length, height at withers, heart girth, rectal temperature and respiration rate) of 6208 registered Sonadi sheep maintained by 147 shepherds of eight tehsils of four districts of Sonadi breeding tract were recorded monthly during pregnancy period up to more than 5 parity. The body length, body height and heart girth were measured from the point of shoulder to pin bone, from the point of wither to ground level and at the mid sternum region, respectively while the body weight were recorded by weighing balance to the nearest of 100 gm. The data being non-orthogonal were subjected to least square and maximum livelihood computer programme (Harvey, 1990). The statistical model for analysis of body weights and measurements included fixed effects due to districts (location) and month of pregnancy. The new multiple range test (DMRT) was employed to compare the sub class means.

RESULTS AND DISCUSSION

The body measurements and weight were recorded during every month of pregnancy from I to V pairty as well as non-pregnant animals. The data were also classified according to sequence of pregnancy. The least-squares means for body weight, measurements and physiological parameters at different sequences of pregnancy are depicted in Table 1. The overall least- squares mean for body weight of ewe (non-pregnant mature animals) was 33.13± 0.33 kg which reached to 35.95±0.48 kg during last months of first pregnancy. These studies were compared by Dass and Prasad (2007) and Dinesh Kumar *et al*. (2006) reported higher estimates of body length, height at withers and chest girth in adult Muzaffarnagari Sheep.

*Assistant Professor, Krishi Vigyan Kendra, Bhilwara-311001 (Rajasthan) E-mail: cmyadav_jaipur@yahoo.com
**Assistant Professor, Department of Animal Production, RCA, Udaipur

Table 1: Least-squares means for body measurements, weight and physiological parameter

Effect	n	Length (cm)	Height (cm)	Girth (cm)	Weight (kg)	Body Temperature (°c)	Respiration Rate (/ min.)
During first pregnancy							
µ	3681	67.85 ± 0.35	68.47 ± 0.31	75.02 ± 0.34	34.46 ± 0.37	38.36±0.07	25.29±0.18
Months of pregnancy		**	NS	*	*	NS	NS
Non-pregnant	3062	68.58b± 0.28	68.58± 0.28	74.81b± 0.31	33.13a± 0.33	38.26±0.06	24.84±0.16
1	51	68.01ab± 0.63	68.45± 0.62	75.22ab± 0.69	33.77ab± 0.74	38.39±0.14	25.57±0.36
2	97	67.44a± 0.50	68.30± 0.49	74.88a± 0.55	34.18b± 0.59	38.52±0.11	25.44±0.29
3	131	67.55a± 0.45	68.40± 0.45	74.72a± 0.50	34.77b± 0.53	38.34±0.10	25.42±0.26
4	158	67.66a± 0.43	68.44± 0.42	74.89a± 0.47	34.96b± 0.50	38.34±0.10	25.30±0.25
5	182	67.92a± 0.41	68.65± 0.40	75.58a± 0.45	35.95c± 0.48	38.25±0.09	25.15±0.2
During pregnancy after first lambing							
µ	5808	65.66 ± 0.30	65.58 ± 0.29	71.85 ± 0.28	29.87 ± 0.27	38.34±0.05	24.66±0.16
Months of pregnancy		NS	NS	**	*	NS	NS
Non-Pregnant	5099	65.92± 0.28	65.71± 0.26	71.39a± 0.26	28.88a± 0.24	38.37±0.09	24.60±0.15
1	78	65.55± 0.54	65.39± 0.52	71.38ab± 0.51	28.77ab± 0.47	38.27±0.09	25.02±0.28
2	99	65.61± 0.50	65.45± 0.47	71.33ab± 0.47	29.73bc± 0.43	38.41±0.08	24.60±0.26
3	145	65.15± 0.43	65.24± 0.41	71.66ab± 0.41	30.05bc± 0.38	38.39±0.07	24.53±0.23
4	183	65.46± 0.40	65.55± 0.39	72.31bc± 0.38	30.32c± 0.35	38.30±0.06	24.71±0.21
5	204	66.25± 0.39	66.13± 0.37	73.02c± 0.37	31.44d± 0.34	38.32±0.06	24.76±0.04
During pregnancy after second lambing							
µ	6208	65.40 ± 0.28	65.34 ± 0.26	73.01 ± 0.26	30.64 ± 0.23	38.29±0.05	24.92±0.13
Months of pregnancy		*	*	**	**	NS	NS
Non-Pregnant	5282	65.86a± 0.27	65.71a± 0.24	72.79a± 0.25	29.36a± 0.39	38.20±0.04	24.81±0.13
1	112	64.80a± 0.47	65.33a± 0.43	72.07ab± 0.43	30.17ab± 0.22	38.25±0.08	25.08±0.22
2	150	65.20a± 0.43	65.34a± 0.39	72.60ab± 0.39	30.63bc± 0.35	38.35±0.07	25.21±0.20
3	189	65.12a± 0.40	65.09a± 0.36	72.93ab± 0.36	30.36bc± 0.32	38.30±0.06	24.99±0.19
4	220	65.37a± 0.38	64.84a± 0.35	73.40bc± 0.35	31.12c± 0.31	38.31±0.07	24.68±0.18
5	255	66.07a± 0.36	65.73a± 0.33	74.25b± 0.33	32.21d± 0.30	38.33±0.06	24.75±0.17

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During pregnancy after third lambing							
µ	5391	66.05 ± 0.38	67.08 ± 0.36	73.11 ± 0.38	30.78 ± 0.32	38.14±0.13	24.39±0.19
Months of pregnancy		*	NS	**	**	NS	NS
Non-pregnant	4754	66.20bcd± 0.37	67.08± 0.34	73.37b± 0.36	30.31a± 0.31	38.00±0.13	24.22±0.19
1	71	66.52abcd± 0.58	67.86± 0.54	72.47a± 0.57	30.32ab± 0.49	38.20±0.20	24.62±0.29
2	100	65.25ac± 0.52	67.03± 0.49	72.14a± 0.51	30.24ab± 0.44	38.21±0.18	24.55±0.26
3	132	65.52ac± 0.48	66.81± 0.46	72.68a± 0.48	30.61ab± 0.41	38.16±0.17	24.20±0.25
4	147	66.32cd± 0.47	67.38± 0.44	73.79bc± 0.47	31.12b± 0.40	38.09±0.16	24.24±0.24
5	187	66.47d± 0.45	67.55± 0.42	74.22c± 0.44	32.08c± 0.38	38.21±0.15	24.50±0.23
During pregnancy after fourth lambing							
µ	2627	65.65 ± 0.32	65.73 ± 0.31	71.77 ± 0.33	29.72 ± 0.31	38.16±0.06	23.86±0.18
Months of pregnancy		NS	NS	NS	*	NS	NS
Non-pregnant	2340	65.66± 0.30	65.94± 0.28	72.07± 0.31	29.36a± 0.28	38.07±0.06	23.63±0.17
1	36	65.67± 0.65	65.21± 0.61	70.86± 0.66	29.44a± 0.28	38.16±0.12	23.45±0.36
2	50	65.45± 0.57	65.55± 0.54	71.37± 0.58	29.30a± 0.53	38.21±0.11	24.03±0.32
3	59	65.45± 0.54	65.84± 0.51	71.33± 0.55	29.09a± 0.50	38.17±0.10	24.01±0.30
4	71	65.69± 0.50	65.86± 0.47	71.84± 0.51	30.09ab± 0.47	38.11±0.10	23.96±0.28
5	71	65.96± 0.50	65.99± 0.47	73.13± 0.51	31.04b± 0.47	38.25±0.10	24.09±0.28
During pregnancy after fifth and above lambing							
µ	1293	67.01 ± 0.43	66.08 ± 0.42	73.73 ± 0.40	30.23 ± 0.43	38.21±0.08	24.68±0.26
Months of pregnancy		NS	NS	*	**	NS	NS
Non-pregnant	1135	67.34± 0.38	66.29± 0.36	73.67ab± 0.35	29.91a± 0.37	38.09±0.07	24.41±0.22
1	17	65.58± 0.96	65.13± 0.92	72.31a± 0.89	28.23a± 0.95	38.38±0.18	24.99±0.57
2	27	66.80± 0.81	66.08± 0.78	73.41abc± 0.75	29.52ab± 0.80	38.16±0.15	24.37±0.48
3	34	66.62± 0.73	65.83± 0.70	73.41abc± 0.68	29.87ab± 0.72	38.24±0.14	24.79±0.43
4	39	67.48± 0.70	66.25± 0.67	74.51bc± 0.65	31.34bc± 0.69	38.17±0.13	24.81±0.41
5	41	68.22± 0.68	66.91± 0.65	75.14c± 0.64	32.52c± 0.68	38.21±0.13	24.73±0.40

Mean with different superscript in a column differed significantly
NS- Non significant, *=P<0.05, **=P<0.01

The effect of month of pregnancy was found to be non-significant on both the physiological parameters. The results of physiological parameters indicated that body temperature ranged between 37.09 to 38.67ºC and respiration rate from 21.67 to 33.60/ minute during different stages of life in Sonadi sheep. The effect of location (districts), sexes, months after lambing and months of pregnancy was non significant. It was concluded that the body length and height was not significantly influenced by month of pregnancy in all the animals. The body girth was significantly ($P<0.01$) influenced by months of pregnancy.

CONCLUSION

It is concluded that body girth increases as pregnancy advanced. The results of physiological parameters indicated that body temprature ranged between 37.09ºC to 38.67ºC and respiration rate from 21.67 to 33.60 per minute during different stages of life in sonadi sheep.

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DOCUMENTATION OF UNDERUTILIZED CROPS OF KUMAON REGION OF UTTARAKHAND STATE: AN EXPLORATIVE STUDY

Tara Koranga* and Dhriti Solanki**

ABSTRACT

An attempt had been made to explore and document the underutilized plants of Kumaon region of Uttarakhand used by the farm families living in remote areas of Himalayan terrain. For the present study, an explorative study was conducted in Bageshwar district of Uttarakhand, by interacting with the local people about the plants/parts used by them in different areas. Focused group discussions were conducted with adult members to identify commonly consumed underutilized plants. From the survey wild vegetables, fruits and herbs were identified, which were used by the farm families during common health problems having medicinal properties. The information collected is compiled according to the category like, wild, cultivated, and its uses. It is suggested to validate scientifically documented underutilized plants for its wider applicability among general mass.

INTRODUCTION

As our population is increasing day by day and natural resources are depleting due to greater extent of illegal human activity, it has become extremely important to diversify the present-day agriculture in order to meet the day to day requirement. Apart from growing regular crops in field/farms to meet the family requirement and to combat malnutrition, due consideration should be given on underutilized plants that can be grown with minimum care and are excellent source of nutrition. Underutilized plants are those which are neither grown commercially on large scale nor traded widely. These crops/plants are cultivated and consumed locally by local people. The popularity of these horticultural crops varies from crop to crop and locality to locality, which however, can be enhanced to a greater extent through publicity. Most of them are very rich source of vitamins, minerals, and other nutrients such as carbohydrates, proteins and fats. Since, the underutilized horticultural crops have a long history of consumption, the local people are aware about their nutritional and medicinal properties (Rai *et al.*, 2005).The state of Uttarakhand is a Himalayan state in north of India and is very rich in wild fruits, herbs and vegetables. Most of the plant species are of economic importance and play a vital role in rural economy. Agricultural development and food security depend on our ability to broaden the range of under-utilized crops in an effective and sustainable way. The under-utilized crop species which are rich in micro-nutrients can contribute effectively to make the diets more balanced and can hence play an important role in combating silent hunger. Development of value added products for increasing the farmers' income is the other notable feature related to production, research and extension of under-utilized crops. Increased production will have to be achieved to ensure regional food security (Gupta and Rajput, 2001). Hence, the present study was undertaken to document and explore the underutilized crops/plants of Kumaon region of Uttarakhand state.

RESEARCH METHODOLOGY

The present study has been carried out in Bageshwar district of Uttarakhand state in the year 2014-15 and total four villages were selected from two blocks namely *Garur* and *Bageshwar* blocks. From each village 25 well experienced farmers above 45 years of age were selected purposively and the information regarding use of different underutilized crops/plants was collected with the help of interview schedule and PRA techniques. Along with this, focused group discussions were organised to get the desired information from the respondents and key informants of the village. Thus, the total sample consisted of 100 farm families.

*Research Associate, ICAR, New Delhi.
**Professor, College of Home Science, MPUAT, Udaipur.

Table 1: Underutilized medicinal plant used by farmers of Kumaon region of Uttarakhand

Botanical name	Family	Local name	Parts use	Uses	Wild/ Culti-vated
Rubusellipticus	Rosaceae	Hishalu	Ripped fruit	Ripped fruit eaten raw	wild
Berberiesasiatica roxb.	Berberidaceae	Kilmori	Ripped fruit	Ripped fruit eaten raw	wild
Citrus limon	Rutaceae	Niboo	Fruit	Eaten raw with adding spices	Wild/ culti-vated
Zanthoxy lumarmatum DC.	Rutaceae	Timur	Bark, Fruit and Branches	Used for toothache	wild
Rhododendron arboretum	Ericaceae	Burans	Flower	Flower juice helpful in blood pressure	wild
Rheum emodi wall.	Polygonaceae	Dolu	Root	Root paste used to cure boils, wound and cuts	wild
Angelica glauca	Umbelliferae	Gand-raine	Root	Indigestion and stomach problem	Wild
Amaranthus paniculatus	Amaranthaceae	Chaulai	Whole plant	Helps to remove Constipation	Wild/ culti-vated
Cannabis sativa	Cannabaceae	Bhang	Seed		wild
Hypericum oblongifolium	Hypericaceae	Piyoli	Flower	Powder of flowers given in jaundice	wild
Cleome viscosa L.	Cleomaceae	Jakhiya	Seed	Seeds used in high blood pressure	Wild/ culti-vated
Myrica esculenta	Myricaceae	Kaphal	Seed	Headache	wild
Agave americana	Agavaceae	Rambass	Sap	Treatment of diarrhoea and dysentery	wild
Solanum nigrum L.	Solanaceae	Geahwai	Stem	Decoction of plant given in swelling	wild
Ficus palmata	Moraceae	Bedu	Fruit, bark, and leaves	Milky Latex is applied on boils, cuts and wounds	wild
Quercus leucotrichophora	Fagaceae	Banj	Bark, leaves, gum	Gonorrhoea, digestive disorder	wild
Sonchus asper Linn	Asteraceae	Karnfool	Root	Root decoction given in stomach problem	wild
Zanthoxylum armatum	Rutaceae	Timoor	Seed	Stem twig is used to brush the teeth to check bad breath and pyorrhoea	wild
Punica granatum	Punicaceae	Darim	Seed	Decoction is given in diarrhoea	wild
Tagetes erecta	Asteraceae	Hajari	Leaf	Leaves juice apply in earache	Wild/ culti-vated
Terminalia bellirica	Combretaceae	Baheda	Ripen fruit	Given in cough and cold	wild

Table 2: Underutilized crop/vegetables used by farmers of Kumaon region of Uttarakhand

Botanical name	Family	Local name	Parts use	Uses	Wild/ Culti-vated
Macrotyloma uniflorum lam.	Fabaceae	Gahat	Seeds	Cure kidney stone	Culti-vated
Eleusine coracana L.	Gramineae	Madua	Flour	Good for diabetic person	Culti-vated
Echinochloa frumentacea Roxb.	Gramineae	Madira	Flour	Given with cow's curd during jaundice and pneumonia	Culti-vated
Setaria italica L.	Gramineae	Kauni	Flour	Porridge and cooked rice of kauni to child during measles	Culti-vated
Glycine max L.	Paplionaceae	Bhatt	Seeds	Decoction are given to cure dyspepsia and jaundice	Culti-vated
Citrus sinensis L.	Rutaceae	Malta	Fruit	Used to cure skin diseases	Wild/ culti-vated
Dioscorea bulbifera L	Dioseoreaceae	Gethi	Bark and fruit	Bark juice apply in skin disease. Cooked fruits are used as vegetable	Wild
Bauhinia purpurea L.	Caesalpiniodeae	Khairwal	Flowers	Useful in piles and blood dysentery	Wild
Ceiba pentandra Linn.	Bambacaceae	Semal	Root	Tap root used in gonorrhoea and dysentery	Wild
Diplazium esculentum Retz.	Dryopteridaceae	Liuen	Young fronds	Helps to cure malaria	Wild
Ficus auriculata Lour.	Moraceae	Timul	Ripen fruits	Control diarrhoea	Wild
Allium cepa	Amaryllidaceae	Pyaaz	Bulb	Juice cures vomiting	Wild/ culti-vated
Linum usitatissium	Linaceae	Alsi	Seeds	Cures boils and pimples	culti-vated
Musa paradisiaca	Musaceae	Kela	Fruit	It cures leucorrhoea	Culti-vated/ wild

RESULTS AND DISCUSSION

In the present study data were collected and underexploited crops have been identified and collected (Table 1 and 2). From the discussion with rural people it was found that in Kumaon region farm families consume many herbs and plant species in their day today life which has medicinal properties and used by them in common health problems such as gouts, toothache, headache, diabetes, fever, stomach ache, jaundice, measles, cold and cough, dysentery etc. Some of these plants and cereal crops

are grow in the fields and some are found in nearby forest areas. These plants/parts contribute significantly in the food of rural masses and have the potential to uplift the economic condition of the local people and to raise their nutritional status. Findings are supported by results of Khare *et al.* (2012) and Semwell *et al.* (2010).

CONCLUSION

Kumaon region has a great diversity of neglected and underutilised crop species. These species have enormous nutritional, medicinal, and economic values which if promoted, could highly contribute to poverty reduction mainly in rural areas, and to the improvement of both nutritional and health status of the local populations. In present situation, availability of the most of these wild crops are now depleting rapidly due to various factors such as shifting cultivation, forest fire, cutting of trees for timber and other human activity in the areas. Therefore, it is important to conserve these forests and do some activity on commercial scale for propagation of these plant species. It is desired to scientifically validate and standardize these practices and disseminate among other farming community.

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CONSTRAINTS EXPERIENCED BY Bt. COTTON GROWERS IN SOUTHERN RAJASTHAN

F.L. Sharma* and Laad Kumari Sharma**

ABSTRACT

The present study was conducted in eight villages of Railmagra tehsil of Rajsamand district (Rajasthan). Total 120 Bt cotton growers were randomly selected for data collection. Thereafter, data were collected from the selected respondents and then data were analysed, tabulated, and interpreted the results in the light of the objectives of the study. Findings of the study revealed that low price of produce at the time of harvesting, poor economic condition of the farmers for purchasing of inputs, high wage rate of labour during harvesting, lack of irrigation water were expressed as most services constraints by the farmers in Bt cotton cultivation.

INTRODUCTION

The Indian Government Permitted commercial cultivation of genetically modified Bt cotton. Bt cotton is genetically engineered cotton, which contains genes taken from a soil bacterium to produce toxins in the plants. It has promoter genes to create doses of the toxins, which are released in all parts of the plants during the entire span of the crop growth. The use of Bt cotton is a positive step towards environmental protection because it makes possible the reduction of the insecticides load in the environment and reduce handling of such chemicals by farmers. Adoption of Bt cotton technology by the farmers depends upon various factors, which may either accelerate or inhibit its adoption. It is important on the part of extension functionaries to identify such factors so as to make dissemination of Bt cotton technology in line with the perception and needs of farmers. Considering the above facts, the present study was undertaken with following specific objectives:

1. To identify the constraints being faced by the farmers in adoption of Bt cotton cultivation technology.
2. To find out the difference in constraints perceived by the marginal, small and large Bt cotton growers.

RESEARCH METHODOLOGY

The present study was conducted in the purposely selected Rajsamand district of Rajasthan. Rajsamand district is situated in southern part of Rajasthan. There are total seven tehsils in Rajsamand district of Rajasthan, out of which, one tehsil namely Railmagra has been selected on the basis of maximum area under cultivation of Bt cotton. Further, a comprehensive list of all the major Bt cotton growing villages was prepared in consultation with the personnel of revenue and Agriculture Department from the identified tehsil. Eight villages from selected tehsil were taken on the basis of maximum area under Bt cotton cultivation. For selection of respondents, 120 farmers (40 marginal, 40 small and 40 large farmers) were randomly selected from identified villages for data collection. Thereafter, data were collected from the selected respondents were analysed, tabulated and interpreted in the light of the objectives of the study.

RESULTS AND DISCUSSION

The constraints under present investigation were considered as major impediments that restrict the farmers to adopt the Bt cotton cultivation technology at their field. The results about constraints are present in subsequent tables. To know the level of constraints, the respondents were grouped into low(<33), (ii) medium (33 to 42) and (iii) High (>42) constraints level on the basis of calculated mean and S.D. of the obtained constraint scores by the respondents. The distribution of respondents is given in Table 1.

Table 1 depicts that 40.83 per cent of total

*Professor, Deptt. of Extension Education, RCA, Udaipur.
**Agriculture Supervisor, Office of Assistant Director Agriculture, Kapasan, Distt. Chiitorgarh.

Table 1. Distribution of respondents on the basis of level of constraints faced in cultivation of Bt cotton

S.No.	Level of constraints	Marginal farmers		Small farmers		Large Farmers		Total	
		f	%	f	%	f	%	f	%
1.	Low (<33)	8	20.00	11	27.50	15	37.50	34	28.33
2.	Medium (33 to 42)	18	45.00	16	40.00	15	37.50	49	40.83
3.	High (>42)	14	35.00	13	32.50	10	25.00	37	30.84
	Total	**40**	**100.00**	**40**	**100.00**	**40**	**100.00**	**120**	**100.00**

f - Frequency, % - per cent

respondents were in medium constraints group, whereas, 30.84 per cent Bt cotton growers were perceived high level of constraints in adoption of Bt cotton cultivation technology and 28.33 per cent respondents were observed in the group of low constraints.

Further analysis of Table 1 shows that 20.00, 27.50 and 37.50 per cent marginal farmers, small farmers and large farmers faced low level of constraints respectively whereas, 45.00,40.00 and 37.50 per cent marginal farmers, small farmers and large farmers were observed in the category of medium level of constraints, respectively. Further, it was found that 35.00, 32.50 and 25.00 per cent marginal farmers, small farmers and large farmers were from high level of constraints group, respectively. From the above matrix, it could be concluded that marginal farmers faced more constraints than small and large farmers in adoption of Bt cotton cultivation technology.

An effort has also been made to find out the priority of constraints perceived by the framers in adoption of Bt cotton cultivation technology. For this mean per cent score for each constraint was calculated and ranked accordingly. The results of the same have been presented in Table 2.

The data presented in Table 2 reveal that "low price of produce at the time of harvesting" was expressed as most important constraint by marginal, small and large farmers with MPS 92.50, 91.10 and 90.86, respectively and ranked first by all the categories of Bt cotton growers. The problem related to low price of produce at the time of harvesting might be because of reason that government is not purchasing produce of Bt cotton at remunerative prices therefore farmers are selling their produce in the local market at lower rate in the study area.

Further analysis of the table reveals that "poor economic condition of the farmers for purchasing of inputs" was also perceived as important constraint by marginal, small and large farmers with MPS 91.66, 90.82 and 90.82, respectively and it was ranked second by the respondents. Likewise, the constraints related to "high wage rate of labour during harvesting time", “non-availability of improved Bt cotton seeds at the time of sowing" and "non-availability of technical advice for Bt cotton" were also realized as major constraints with overall MPS 85.56, 83.05 and 79.30, respectively.

The table further shows that "lack of irrigation water", "uncertainty of rains during crop season", “high cost of Bt cotton seeds”, "minimum support price is not declared before sowing season ", "timely unavailability of electricity", "non-availability of credit on marginal interest", "high cost of fertilizers", "high cost of insecticides and pesticides", "lack of ware housing facility" and "inadequate transport facilities' were also considered as important constraints by the respondents in adoption of improved Bt cotton cultivation technology. The overall mean per cent score of these constraints are 78.33, 73.07, 68.53, 67.93, 67.06, 66.90, 56.45, 55.80, 53.74 and 53.07, respectively. The least important constraint faced by Bt cotton growers was "unawareness about critical stages of Bt cotton for irrigation" with overall MPS 36.10. This may be due to the fact that majority of the respondents were acquainted about critical stages of Bt cotton for irrigation.

Table 2 : Constraints perceived by the farmers in adoption of recommended Bt cotton cultivation technology

S. No	Constraints	Marginal farmers		Small farmers		Large farmers		Total	
		MPS	Rank	MPS	Rank	MPS	Rank	MPS	Rank
1.	Non-availability of improved seeds at the time of sowing	80.00	5	82.51	4	86.16	3	83.05	4
2.	Non-availability of recommended chemicals for seed treatment	49.46	17	47.23	17	49.37	16	48.36	17
3.	Lack of irrigation water	85.00	4	78.36	6	71.03	6	78.33	6
4.	Lack of ware housing facility	58.34	14	59.00	12	53.76	15	53.74	14
5.	High cost of Bt cotton seeds	74.16	7	70.81	8	60.81	10	68.53	8
6.	High cost of fertilizers	60.79	12	58.35	13	50.37	14	56.45	12
7.	High cost of insecticides and pesticides	59.18	13	55.81	14	52.05	12	55.80	13
8.	Non-availability of credit on marginal interest	69.37	11	68.32	10	63.35	9	66.90	11
9.	Minimum support price is not declared before sowing season	70.47	10	67.51	11	65.00	8	67.93	9
10.	Lack of skill for seed treatment	52.00	16	50.13	16	45.18	17	50.39	16
11.	Weed management through weedicides is technically complex	41.13	19	39.76	19	36.16	19	39.86	19
12.	Poor economic condition of the farmers for purchasing of inputs	91.66	2	90.82	2	90.82	2	91.10	2
13.	Inadequate transport facilities	55.07	15	55.00	15	50.84	13	53.07	15
14.	Non- availability of technical advice	72.53	9	81.32	5	84.66	4	79.30	5
15.	Non-availability of suitable equipments for plant protection measures	47.50	18	44.47	18	40.53	18	44.09	18
16.	Timely unavailability of electricity	72.79	8	68.85	9	60.17	11	67.06	10
17.	Uncertainty of rains during crop season	75.83	6	72.50	7	70.78	7	73.07	7
18.	Unawareness about critical stages of Bt cotton	37.49	20	35.08	20	33.07	20	36.10	20
19	Low Price of produce at the time of harvesting	92.50	1	91.10	1	90.86	1	91.49	1
20.	High wage rate of labour during harvesting time	87.50	3	87.07	3	83.36	5	85.56	3

MPS=Mean Per cent Score

The present findings are in accordance with the findings of Meti and Hanchinal (1995) who revealed that lack of availability of good variety seeds in market in time (97.50%), heavy expenditure from sowing to harvest (95.83%), lack of awareness about dryland recommended cotton technologies (92.50%), lack of finance to purchase the required inputs (85.83%) and uncertainty of rains at the time of sowing and during critical period of crop (83.83%) were major constraints for non-adoption of dry land recommended cotton technology.

To find out the significant difference in the constraints perceived by the marginal, small and large farmers in Bt cotton cultivation technology, 'F' test was applied. The results are presented in Table 3.

Table 3 : Significance of difference in constraints perceived by the marginal, small and large farmers in adoption of Bt cotton cultivation technology

Source of variation	d.f.	SS	MSS	F Value
Between the categories of farmers	2	5.02	2.51	0.617NS
Error	117	475.45	4.063	
Total	**119**	**480.47**		

NS = Non significant at 5% level

Data presented in Table 3 show that the calculated 'F' value 0.617 was less than tabulated value at 5 per cent level of significance. It means that there was no significant difference among marginal, small and large farmers with respect to perception of constraints in adoption of Bt cotton cultivation practices. Thus, it is inferred that all the categories of respondents faced same level of constraints in the study area. Findings have been supported by Thalor (2004) who observed that different problems were prioritized similar by beneficiary and non-beneficiary respondents related to sustainable use of organic farming practices in cotton.

CONCLUSION

From the above results it can be concluded that low price of produce at the time of harvesting, poor economic condition of the farmers for purchasing of inputs, high wage rate of labour during harvesting, lack of irrigation water, non-availability improved seed at the time of sowing, uncertainty of rains, high cost of Bt cotton seeds and minimum support price is not declared before sowing were experienced as most important constraints by the Bt cotton growers.

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ROLE PERCEPTION OF SAKHI MANDAL MEMBERS IN NAVSARI DISTRICT OF GUJARAT

Rajasree R.*

ABSTRACT

Sakhi Mandals are woman self-help groups initiated by the Gujarat state government in order to promote human resources, thereby strengthening the livelihood of the people. Self help groups create an opportunity to gain confidence, to share their thoughts with the peer group and gives a better environment to develop one self. The study was conducted to assess the relationship of role perception and role performance of Sakhi Mandal members with their personal profile. It was conducted in Navsari district of South Gujarat covering 200 respondents from two clusters. Some statistical tools have been applied where necessary. Medium level of role perception was found in both the clusters. Level of aspiration and group cohesiveness were found to be positive and significant relationship with role perception.

INTRODUCTION

One of the major empowerment programs for women was the formation of self- help groups through the micro-finance system. The major goals of micro-finance system are to alleviate poverty, assist the women financially and to help in self- development of each member. It was found that SHG model has helped the rural women to start micro enterprises including farm and non farm activities, trading and service units (Anonymous, 2007).

Perception lies at the base of every human activity. Role perception refers to the member's perceptions on factors behind group success. It is an important aspect closely related with the individual behaviour in a workplace. The promoting agency of self-help groups plays an important role in inculcating team spirit and making the rural women folk in understanding the working pattern and goals of SHGs. Sakhi mandals are women self help groups initiated by the Gujarat state government for enhancing the women livelihood and thereby improving the social status of the women. It was started in the year 2006.

The present study examines profile of the members of Sakhi Mandal, know the role perception of members and relationship between profile of the members and role perception.

METHODOLOGY

The present investigation was conducted in Sakhi Mandals of Navsari district. An ex-post facto design was adopted for this study. Jalalpore and *Vansda* talukas were purposively selected as tribal communities were more in *Vansda* taluka whereas non-tribal farmers were more in Jalalpore. From these talukas, two Sakhi Mandal cluster units *viz.*, *Aat* and *Mahuwas* were selected randomly. Total sample size for the study was 200, where 115 drawn from *Aat* and 85 respondents from *Mahuwas*. The socio-economic diversity within the district made investigator to select these talukas. A personal interview method was used to collect the data from the respondents and analyzed by using appropriate statistical methods like mean, percentage, correlation, etc. Role perception of Sakhi Mandal members was measured by using scheduled questionnaire containing 12 questions about the several aspects of Sakhi Mandal scheme and its activities. The responses were recorded with the help of a three point continuum which were 'Often, Sometimes and Not at All' with score 2, 1 and 0, respectivily. The maximum score was 24 and minimum was 0. Then the respondents were grouped into three categories based on arbitrary method. To assess the relationship between socio-personal characteristics and knowledge level of the beneficiaries coefficient of correlation was used.

RESULTS AND DISCUSSION

Socio-economic Characteristics of Sakhi Mandal members: Majority of the respondents (50.43 per cent) of *Aat* cluster belonged to middle age group

*Ph.D. Scholars, Department of Extension Education, Rajasthan College of Agriculture, M.P.U.A.T, Udaipur.

whereas in *Mahuwas* cluster majority (52.94 per cent) belonged to young age. About 39.13 per cent of the respondents of *Aat* cluster were having primary level of education and 35.29 per cent of the respondents of *Mahuwas* cluster were illiterate. Majoritity of the respondents of *Aat* (89.57 %) and *Mahuwas* cluster (92.94 %) were married. Majority of the respondents of both *Aat* and *Mahuwas* clusters were Hindus. In *Mahuwas* cluster, 77.65 per cent respondents were having kaccha house whereas majority of the respondents from Jalalpore had pucca house. More than 60.00 per cent of *Mahuwas* cluster members had income up to Rs.50,000 whereas, in *Aat* cluster more than 65.00 per cent of the respondents belonged to Rs.50,000 to Rs.1,00,000 income group. More than 80.00 per cent in both the clusters had deposited savings up to Rs.1000 per year. Most of the Sakhi Mandal members in *Aat* and *Mahuwas* had very less social participation. More than 70.00 per cent and 50.00 per cent of the respondents of *Aat* and *Mahuwas* cluster were belonged to medium level of aspiration. Majority of the respondents had medium level of group cohesiveness.

Role Perception: From Table 1, it is understood that more than half of the respondents in *Aat* cluster and *Mahuwas* cluster Sakhi Mandal were having medium role perception. In *Aat* cluster, 66.09 per cent of the respondents had medium role perception followed by 17.39 per cent were of high role perception and 16.52 per cent were of low role perception. In *Mahuwas* cluster, out of 85 respondents 75.29 per cent were of medium role perception followed by 14.12 per cent having low perception and remaining 10.59 per cent high role perception. The probable reason might be due to active interaction between the members and trainings conducted by the officials in the tribal areas were more whereas in *Aat* opinion differences between the members and mindset of an individual influences the perception.

Relationship between socio-economic profile and role perception : To test the hypothesis that profile of the members and role perception are related, the coefficient correlation has been used. The calculated 'r' values presented in Table 3, revealed that level of aspiration and group cohesiveness had positive and highly significant relationship with the role perception of the Sakhi Mandal members of *Mahuwas* cluster. Most of the Sakhi Mandals in *Mahuwas* cluster have been established from more than three years, so members were having good interaction between each other and team spirit. This might be the probable reason for this result. Also, annual income and savings had positive and significant relation with the role perception. Among the rest of the variables, age, marital status, type of family and social participation were positively but non-significantly carrelated had with the role perception. At the same time, in *Aat* cluster, level of aspiration positive and highly significant relationship with the role performance and group cohesiveness. Education of Sakhi Mandal members was found to have negative and significant relationship with the role perception in both the areas of the study. It indicates that level of role perception was higher even though their formal education was less.

CONCLUSION

Level of aspiration had positive and highly significant relationship with the role perception in tribal and non-tribal clusters of Sakhi Mandals

Table 1: Distribution of respondents according to overall role perception

Sr.No.	Category	*Aat* cluster (Mean = 15.04, Standard deviation = 1.76)		*Mahuwas* cluster (Mean = 17.83, Standard deviation = 2.34)	
		Frequency	Percentage	Frequency	Percentage
1.	Low role perception	19	16.52	12	14.12
2.	Medium role perception	76	66.09	64	75.29
3.	High role perception	20	17.39	9	10.59
	Grand total	**115**	**100**	**85**	**100**

Table 3. Relationship between Independent variables and Role Perception

Independent variables	Correlation co-efficient ('r' value) *Mahuwas* Cluster	Correlation co-efficient ('r' value) *Aat* cluster
1. Age	0.1790NS	0.104 NS
2. Education	-0.2806**	-0.1897*
3. Marital status	0.1928NS	-0.11NS
4. Type of family	0.1206NS	-0.10NS
5. Type of house	-0.0953NS	0.0015NS
6. Annual Income	0.2205*	0.135NS
7. Savings	0.2313*	0.21*
8. Level of aspiration	0.4983**	0.2809**
9. Social Participation	0.0122NS	0.0044NS
10. Group cohesiveness	0.3621**	0.2025*

*Significant at 5 percent level of significance, **Significant at 1 percent level of significance, NS = Non significant

whereas education was found to be negative and significant relationship with the role perception. It indicates that level of role perception is higher even though their formal education is less. Rest of the variables viz., age, marital status and type of family were positively non-significant.

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KNOWLEDGE OF FARMERS USING MOBILE PHONE BASED AGRICULTURE ADVISORY SERVICES ABOUT CROP MANAGEMENT

Rajneesh*, Shubham Mishra and Mukesh Choudhary*****

ABSTRACT

The study was conducted to measure the knowledge level of 80 farmers who were using mobile phone based agricultural advisory services for the management of their rice crop in Bundi district of Rajasthan. The study revealed that majority of the farmers (46.25 per cent) have medium knowledge level and 20 per cent respondents show low knowledge level about rice crop management activities because most of the farmers cannot use the various applications of mobile phone services like internet, 3G etc. and they have difficulty in the use of given information through mobile phone based advisory services. The results also revealed that 33.75 per cent respondents who were perfect in the use of mobile phone based agriculture advisory services had high knowledge about rice crop management activities like production, protection and marketing, etc.

INTRODUCTION

Indian agriculture contributes 13.7 per cent to our GDP and approximately 70 per cent Indians derive their livelihood directly or indirectly from the agricultural sector. In 21st century agriculture continues to be the key sector to provide foundation for sustainability of millions of Indian farmers' families. No doubt, we are self-sufficient in food grain production but still there is huge potential to be tapped in agricultural production. To increase the production it is also important to minimise the losses that occurs during production and storage. For increase the production, reduce the losses and for successful natural resource management (NRM), planning, implementation and evaluation processes that are known as the most important determinants of agricultural productivity farmers require appropriate knowledge and information (Masuki, K.F.G. 2010). This study aimed to assess the knowledge of farmers who were using the mobile phone based agricultural advisory services as a source of appropriate knowledge and information for their crop management. Mobile phone provides producer with information and knowledge on production and protection measures, correct market price, quality and available quantity of a particular product andtechnical advice for successfully management of their crop (Mittal, S. and Tripathi, G. 2009).

METHODOLOGY

This study was conducted to measure the rice crop management knowledge of 80 farmers who were using mobile based agriculture advisory system for getting information and solution of their personal problems of rice crop management in the Bundi district of Rajasthan. Bundi district was selected purposively on the basis of its second position in production of rice crop in the state. The term "management" includes all the activities from sowing to selling the crop produce.

An interview schedule consisting of measuring device for knowledge of respondents including eleven practices and each practice was further divided into several questions about knowledge of rice crop management was used for data collection. The collected data were tabulated, analyzed and inferences were drawn after subjecting the data to statistical analysis.

Knowledge of respondents about rice crop management was directly or indirectly influenced by the use of mobile phone based agriculture advisory services with this view in mind the knowledge test developed by Chaturvedi (2000) was applied to measure the knowledge level of all respondents. The responses obtained from the respondents were counted and knowledge scores of each respondent

*Ph.D. Scholar, Department of Extension Education, RCA, Udaipur. E-mail: rajneeshkhinchi@gmail.com
**Ph.D. Scholar, Department of Extension Education, RCA, Udaipur. E-mail: rajneeshkhinchi@gmail.com
***Ph.D. Scholar, Department of Extension Education, RCA, Udaipur. E-mail: rajneeshkhinchi@gmail.com

converted into mean, standard deviation and mean per cent score. The knowledge index for each respondent was calculated by using following formula.

$$KI = K/P \times 100$$

KI = Knowledge index

K = Knowledge score obtained

P = Possible maximum score

Based on the mean and standard deviation the farmers were categorized under three knowledge level categories, namely low, medium and high knowledge level as follows:

Category		**Scores obtained**
Low Level of knowledge	=	< (Mean Score - S.D.)
Medium Level of knowledge	=	(Mean Score - S.D.) to (Mean Score + S.D.)
High Level of knowledge	=	> (Mean Score + S.D.)

RESULTS AND DISCUSSION

The knowledge score of respondents using mobile phone based agriculture advisory system as a source of information was measured and the respondents were grouped into three categories viz., Low, Medium and High knowledge levels based on knowledge score, mean (39.60) and standard deviation (11.06).

The farmers who obtained knowledge score below 28.54 were categorized under low knowledge level and from 28.54 to 50.66 were categorized under medium knowledge level and score above 50.66 were categorized under high knowledge level.

Table 1 : Distribution of respondents according to their level of knowledge about rice crop management

N=80

Sr.	**Knowledge Category**	**Number of respondents**	**Percentage**
1	High Knowledge	27	33.75
2	Medium Knowledge	37	46.25
3	Low Knowledge	16	20
	Total	**80**	**100**

$\bar{x}$ = 39.60 σ = 11.06

The data in Table 1 indicate that out of the total respondents 46.25 per cent respondents were having medium knowledge level about rice crop management and 33.75 per cent respondents were having high knowledge level whereas, 20 per cent of respondents were having low knowledge level respectively.

Out of total, 80 per cent respondents were found under the category of medium and high knowledge level group. It reflects that the respondents had fair knowledge about rice crop management. The findings are supported by the findings of Verma *et al.* (2013) who reported that majority of total IKSL mobile phone service user respondents had medium level of knowledge.

The knowledge about rice crop management was also analyzed separately for all the eleven practices of rice crop management and highlighted by ranking their knowledge level on the basis of mean per cent scores (MPS) of knowledge.

Table 2 : Knowledge of mobile phone based agriculture advisory services user farmers about rice crop management practices

N = 80

Sr.	**Package of practices**	**Mean per cent score**	**Rank**
1.	Field preparation	61.79	VII
2.	High yieldfing varieties	79.75	II
3.	Seed treatment	60.00	VIII
4.	Sowing and transplanting	76.50	III
5.	Nutrient management	54.13	IX
6.	Irrigation management	20.21	XI
7.	Weed management	75.63	IV
8.	Plant protection measures	85.00	I
9.	Harvesting and Storage	67.92	VI
10.	Marketing activities	70.00	V
11.	Miscellaneous activities	24.82	X
	Average	**61.43**	

The data in Table 2 indicate that the average knowledge level about all the eleven practices of rice

crop management was 61.43. The data also indicates that respondents had highest knowledge about "Plant protection measures" with 85.00 MPS and hence this practice was ranked first. The second highest knowledge was about "High yielding varieties" with 79.75 MPS followed by "Sowing and transplanting" (76.50 MPS) and "Weed management" (75.63 MPS) which were ranked third and fourth, respectively.The knowledge aspects like "Marketing activities", "Harvesting and Storage", "Field preparation" and "Seed treatment", were moderately known by the respondents as they were having 70.00, 67.92, 61.79 and 60.00 MPS and were ranked fifth, sixth, seventh and eighth, respectively. Lowest knowledge was found in "Nutrient management" (54.13 MPS), "Miscellaneous activities" (24.82 MPS) and "Irrigation management" (20.21 MPS) hence, last ninth, tenth and eleventh ranks were assigned to them, respectively.

CONCLUSION

It can be concluded that 33.75 per cent respondents who were perfectly using mobile phone based agriculture advisory services had high knowledge about insect pest and diseases of rice crop. They very well know about the control measures like chemicals and methods of their application, selection of high yielding varieties and also about early and late sowing varieties, name of weeds and control of weeds by mechanical and chemical method by spraying herbicides, importance of seed treatment and chemicals used for that, marketing activities like last year market price and MSP (minimum support price) by Govt. for rice crop produce.

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DEVELOPMENT OF AWARENESS PACKAGE AND DISSEMINATION OF INFORMATION REGARDING CLEAN TECHNOLOGIES IN TEXTILE PROCESSING

Meenu Srivastava*

ABSTRACT

The present research is part of the investigation carried out to study the "Environmental Sensitization of textile processing units of Pali." To achieve the objectives proposed in the research plan, 60 textile processing units of Pali were selected for studying their profile, researcher investigating the various processes, chemicals used and their impact on environment. The researcher also gathered information regarding common effluent treatment plant and their functioning, laboratory testing was carried out to assess the different parameters like colour, odour, pH, TDS, COD, BOD, EC and DO in textile effluent, from the inlet and outlet source of CETP I and II installed at Mandia road, Pali. Water and soil samples from the selected eight villages adjoining the Bandi river were also analyzed for different parameters with standard methods. In order to assess the health status of textile workers, a sample of 120 textile workers was selected from different subunits of selected textile processing units. Information was drawn about the working environment and other health aspects. An awareness package on 'Clean technologies in textile processing'was developed and information was disseminated through workshop. Findings revealed the significant difference in the knowledge of textile owners at pre and post exposure stage.

INTRODUCTION

Pali is the largest erstwhile hand processing clusters, now gradually moving to power processing machines. It is best known for dyeing and printing of cotton and synthetic fabrics. Pollution is the main accuse in the textile processing units. The effluents discharged from these units causes environmental pollution. Textile effluents discharged from various textile processing units of Pali, flow about 55 Kilometer down stream, making the ground water in several river bank villages unfit for drinking and irrigation and also causes adverse effect on crops productivity and health of people residing in those areas. Before disposal they need to be treated for certain acceptable tolerance limits since pollution control laws are strictly followed all over the world and captured worldwide attention. The use of toxic chemicals in these units cause threat to the manpower employed in such units in a way directly resulting in occupational health hazards. Further to be in tune with the government restrictions to be connected to CETP, majority of textile processing houses/units of Pali district are now adjoined to CETP. Inspite of the installation of CETP, the Bandi River still have enormous water and soil pollution adversely affecting the fertility of soil and purity of drinking water. The present research is part of the investigation on "Environmental Sensitization of textile processing units of Pali", in which an awareness package was developed and information was disseminated through workshop to textile mill owners on environmental sensitization.

RESEARCH METHODOLOGY

The researcher surveyed 60 textile mill owners/ managers and thoroughly studied the profile of textile mills of Pali district on various parameters. Based on the problems observed, the need was felt to develop an awareness package on environmental sensitization.

Development of Awareness package : The researcher developed an information package for generating awareness among textile mill managers, owners, based on the findings of the present research, by consulting resource persons, reviewing literature, searching internet etc. Awareness aids viz. pamphlets, power point presentation and booklets were also prepared including "Clean technologies in textile processing" and "suggestive measures for prevention of occupational health hazards".

*Professor, Dept. of Textiles & Apparel Designing, College of Home Science, MPUAT, Udaipur.

Dissemination of Information among textile owners: The researcher organized one day awareness generating programme on the theme "Clean technologies in textile processing" which was held at District club, Pali in joint collaboration with Common Effluent Treatment Plant and Textile Association of Pali. The main aim of this campaign was to sensitize and raise awareness level of textile mill owners about benefits and use of clean technologies in textile processing to minimize textile effluents creating environmental pollution. A good number of textile mill owners/managers of Pali district were contacted and informed about the awareness workshop being organized, which included the selected sample of present investigation alongwith those who were not included earlier, were also invited to attend this workshop. In total there were 60 participants who were benefitted with this workshop. The activities in awareness programme included information dissemination through lectures and interactive session with the help of power point presentation and distribution of awareness package among textile owners. They raised several queries, which were solved by the researcher quite confidently. The display of research findings with proper tables and photographs showing soil and water pollution and health hazards among workers was very alarming to them.

The researcher also distributed them a booklet entitled "Suggestive measures to prevent occupational health hazards of textile workers" which emphasized the need of maintaining proper hygiene, sanitation, water supply, hygienic toilets, proper ventilation, lighting, health education among workers besides having the facility of first aids and safety equipments at work place.

Impact assessment of awareness Workshop on respondents : A self structured performa was prepared to assess the existing knowledge level of textile owners regarding clean technologies in textile processing. The performa was administered by personal interview method on 60 respondents. Post exposure knowledge level of the respondents was measured after dissemination of awareness through package and lectures using the same performa.

The Table 1 clearly highlights that significant difference was found in the knowledge of textile owners at pre and post exposure stage on different aspects i.e. Awareness about the benefits of clean technologies (Mean 1.62 + 0.85 and 4.72 + 0.52), Awareness about recycling of textile effluents (Mean 1.87 + 0.93 and 4.75 + 0.54), Awareness about processes of reduction of waste concentration (Mean 1.90 + 0.90 and 4.82 + 0.43), Awareness about Bio processing of textiles (Mean 1.52 + 0.79 and 4.67 + 0.66) and Awareness about eco friendly and new

Table 1: Knowledge acquisition of respondents regarding clean technologies in textile processing

N=60

Knowledge Parameter	Pre - Test		Post - Test		Z	Result
	Mean	Standard deviation	Mean	Standard deviation		
Awareness about the benefits of clean technologies	1.62	0.85	4.72	0.52	-24.14	***
Awareness about recycling of textile effluents	1.87	0.93	4.75	0.54	-20.78	***
Awareness about processes of reduction of waste concentration	1.90	0.90	4.82	0.43	-22.71	***
Awareness about Bio processing of textiles	1.52	0.79	4.67	0.66	-23.74	***
Awareness about eco friendly and new technologies in textile processing	2.03	0.96	4.65	0.68	-17.24	***

(*** < 0.001)

technologies in textile processing (Mean 1.79 + 0.90 and 4.72 + 0.57). The mean differences at post exposure stage on all the aspects were comparatively higher than that of means at pre exposure stage of respondents. These differences clearly highlighted the impact of awareness campaign on the increase in knowledge of respondents on different aspects of clean technologies in textile processing.

CONCLUSION

It can be concluded that significant difference was found in the knowledge of textile owners at pre and post exposure stage on different aspects of clean technologies. The knowledge level was significantly higher after awareness campaign and distribution of awareness package indicating significant effectiveness of developed package. The findings of the study emphasized the need of organizing frequent awareness generation programme for textile mill owners at large scale to sensitize them about increasing pollution load on environment and adopt clean technologies.

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KNOWLEDGE LEVEL OF FARMERS TOWARDS PRADHAN MANTRI CROP INSURANCE SCHEME IN UDAIPUR DISTRICT OF RAJASTHAN

Babu Lal Dhayal* and Rajeev Bairathi**

ABSTRACT

Looking to the importance of insurance scheme, the present study entitled "Knowledge and opinion of farmers towards Pradhan Mantri Crop Insurance Scheme in Udaipur district of Rajasthan" was conducted in the purposely selected Salumber and Sarada tehsils of Udaipur district of Rajasthan. Five villages from each selected tehsils were taken on the basis of maximum number of beneficiary farmers. Thus, total ten villages were selected for the study. Out of the prepared list, 10 farmers were selected from each village on the basis of random sampling technique. Thus, total 100 farmers were selected for present investigation. Data were collected through pre structured interview schedule. The study indicated that majority of respondents fell in medium level knowledge group. The study revealed that unit of insurance is area approach was the most important knowledge aspect as expressed by majority of the insured farmers. There was no significant difference between farmers of both selected tehsils regarding knowledge about Pradhan Mantri Crop Insurance Scheme.

INTRODUCTION

Crop insurance initially evolved and implemented in Mexico, Japan, Australia, United States and Brazil. These experiences and those of other countries provide lessons, the design and management of agricultural insurance programmes about the role of crop insurance as a public risk management policy. Countries such as the United States, Japan, Brazil, Sri Lanka, Mauritius and Mexico have several decades' experiences with publicly supported crop insurance programmes. The U.S. government involved in crop insurance in 1938 after several attempts in the private sector and failed to provide multiple-peril crop insurance.

The agricultural sector privilege crop insurance schemes - Scheme based on 'Individual' approach, 1972-1978, Pilot Crop Insurance Scheme (PCIS), 1979-1984, Comprehensive Crop Insurance Scheme (CCIS), 1985-1999, Experimental Crop Insurance Scheme, (ECIS), 1997-98, National Agricultural Insurance Scheme (NAIS), 1999 in India has been accorded top priority since independence. A cursory look at the growth of agriculture in the past five decades indicates that agricultural production has reached comfortable heights especially after the Green Revolution.

Pradhan Mantri Crop Insurance Scheme was announced by the Government of India on 13th January 2016. It envisages a uniform premium of only 2 per cent to be paid by farmers for Kharif crops and 1.5 per cent for Rabi crops. The premium for annual commercial and horticultural crops is 5 per cent. This scheme allowed the farmers to pay a very low premium to insure their crops. The difference between the premium paid by the farmers and the premium fixed by the insurance companies is subsidized and there is no cap on the maximum subsidy to be paid by the Government.

RESEARCH METHODOLOGY

The present study was conducted in the purposely selected Salumber and Sarada tehsils of Udaipur district of Rajasthan. Five villages from each selected tehsils were taken on the basis of maximum number of beneficiary farmers. Thus, total ten villages were selected for the study. Out of the prepared list, 10 farmers were selected from each village on the basis of random sampling technique. Thus, total 100 farmers were selected for present investigation. Data were collected through pre structured interview schedule. Thereafter, data were analyzed and results were interpreted as given below:

*M.Sc. Scholar, Department of Extension Education, Rajasthan College of Agriculture, MPUAT, Udaipur.
**Assoc. Professor, Department of Extension Education, Rajasthan College of Agriculture, MPUAT, Udaipur.

RESULTS AND DISCUSSION

The existing status of knowledge of insured farmers about Pradhan Mantri Crop insurance Scheme was assessed. Knowledge as a body of understood information possessed by an individual is one of the important components of behavioral aspect and plays important role in adoption of a new idea. On this ground, it was realized imperative to examine the extent of knowledge of insured farmers about Pradhan Mantri Crop Insurance Scheme.

To get an overview of the knowledge level about Pradhan Mantri Crop Insurance Scheme, the respondents were categorized in to low, medium and high level knowledge groups on the basis of calculated mean score and standard deviation.

Table 1 reveals that out of 100 respondents, majority of respondents (57.00%) fell in medium level knowledge group whereas, 26.00 per cent insured farmer were observed in the high level knowledge group and remaining 17.00 per cent respondents possessed low level of knowledge about PMCIS.

Analysis of Table 1 further reveals that 16.00 and 18.00 per cent respondents were observed in low level knowledge group in Salumber and Sarada tehsil, respectively, while, 52.00 and 62.00 per cent respondents were observed in medium knowledge level group in Salumber and Sarada tehsil, respectively. About 32.00 and 20.00 per cent respondents were observed in high level knowledge group from Salumber and Sarada tehsils, respectively.

Findings are in agreement with the findings of Roy and Bhagat (2012) who revealed that the majority (70.00%) of the respondents belonged to medium level knowledge category, while 20.00 per cent possessed high knowledge level and 10.00 per cent of the respondent belonged to low knowledge level group.

Individual aspect wise knowledge of insured farmers was also worked out for drawing a picture about the areas where insured farmers had good knowledge and where they are lacking, so that aspects with low knowledge can be given more importance in future.

For working out the knowledge of respondents (both Salumber and Sarada) toward different aspects of scheme, in all 20 statements were considered. The mean per cent score (MPS) was calculated for each statement and rank was assigned accordingly. The results have been presented in Table 2. It is evident from the data incorporated in Table 2 that 'unit of insurance is area approach' was the most favoured knowledge statement expressed by majority of the insured famers with MPS 89.00 and was ranked first. 'Risk covered are natural fire/lighting/storm/ cyclone/ hailstorm/flood/drought' was second important knowledge area perceived by the insured farmers with MPS 86.00 and was ranked second.

Table 2 further shows that insured farmers considered 'crop insurance is compensation to losses of crop' with 85.00 MPS and ranked third. Likewise, 'parameters of crop insurance are humidity/ temperature/frost/high winds/excess rainfall' was another important knowledge aspect with 83.00 MPS

Table 1: Distribution of respondents on the basis of their level of knowledge about PMCIS

n=100

S. No.	Knowledge Category	Tehsil Salumber		Tehsil Sarada		Total	
		f	%	f	%	f	%
1.	Low (< 14.71 Score)	8	47.05* 16.00**	9	52.95* 18.00**	17	100.00* 17.00**
2.	Medium(14.71-16.05 Score)	26	45.62* 52.00**	31	54.38* 62.00**	57	100.00* 57.00**
3	High (> 16.05 Score)	16	61.54* 32.00**	10	38.46* 20.00**	26	100.00* 26.00**
	Total	**50**	**100**	**50**	**100**	**100**	**100**

f= frequency, % = per cent, *= Row per cent, **= Column per cent

and was ranked fourth by the insured farmers followed by 'prime objective of PMCIS is to provide financial support due to crop losses with 80.00 MPS and was ranked fifth by the insured farmers. Table further shows that 'in case of crop loss farmers can report to concerned patwari /bank' with 79.00 MPS was ranked sixth by the insured farmers, whereas, the knowledge in descending order of its magnitude was related to 'crop can be get insured through financing institution/insurance agent' with 77.00 MPS and was ranked seventh by the insured farmers. Another knowledge aspect which was important for insured farmers was that 'time period of getting claim is three months or above' with 76.00 MPS and was ranked eighth by the insured farmers.

Table 2 further shows that knowledge on aspects like 'purpose of crop insurance is mitigating the loss' was assigned ninth rank with 75.00 MPS by the insured farmers followed by knowledge like 'premium rate for pulses & oilseeds is 1.5 per cent' with 74.00 MPS and was ranked tenth by the insured farmers. The next important least knowledge aspect of the insured farmers was 'reporting period of crop loss for claim is within 14 days' with 73.00 MPS and was ranked eleventh by the insured farmers. Table further shows that knowledge like 'crop covered under PMCIS are cereals/millets/ pulses/oilseeds/ commercial/ horticulture crops' was assigned twelfth rank with 72.00 MPS by the insured farmers followed by knowledge about 'premium rate for cereal & millets is 2 per cent' with 71.00 MPS and ranked thirteenth. Another knowledge aspect which was related to the insured farmers was 'premium covered for small/ marginal farmers is 75 per cent and others farmers is 50 per cent' with 70.00 MPS and was ranked fourteenth by the insured farmers.

The next knowledge aspect related to the insured farmers was' premium rate of horticulture crops is 5 per cent' with 69.00 MPS and was ranked fifteenth by the insured farmers. 'PMCIS started in kharif 2016' was accorded sixteenth rank with 68.00 MPS by the insured farmers.

Table 2: Aspect-wise knowledge of respondents regarding Pradhan Mantri Crop Insurance Scheme

S. No.	Aspects	MPS	Rank
1.	Unit of insurance is area approach	89	I
2.	Risk covered are natural fire/lighting/storm/cyclone/flood/drought	86	II
3.	Crop insurance is compensation to losses of crop	85	III
4.	Parameters of crop insurance are humidity/temperature/frost/high winds/excess rainfall	83	IV
5.	Prime objective of PMCIS is to provide financial support due to crop loss	80	V
6.	In case of crop loss farmers can report to concerned patwari / bank	79	VI
7.	Crop can be get insured through financing institution / insurance agent	77	VII
8.	Time period of getting of claim is 3 months or above	76	VIII
9.	Purpose of crop insurance in mitigating the loss	75	IX
10.	Premium rate for pulses & oilseeds is 1.5 per cent	74	X
11.	Reporting period of crop loss for claim is within 14 days	73	XI
12.	Crop covered under PMCIS are cereals/millets/ pulses/oilseeds/commercial/ horticulture crops	72	XII
13.	Premium rate for cereal & millets is 2 per cent	71	XIII
14.	Premium covered for small/marginal farmers is 75 per cent and other farmers is 50%	70	XIV
15.	Premium rate for horticulture crops is 5 per cent	69	XV
16.	PMCIS started in Kharif 2016	68	XVI
17.	Only loanee farmers covered under PMCIS	64	XVII
18.	Your crop is insured by IFFCO-TOKIO	63	XVIII
19.	All states & Union Territories covered under the scheme	60	XIX
20.	Is non-loanee farmers covered under PMCIS	57	XX
	Average Knowledge score	72.5	

MPS = Mean per cent score

'Only loanee farmers covered under PMCIS' was assigned seventeenth rank with 64.00 MPS by the insured farmers. 'Your Crop is insured by IFFCO-TOKIO' was ranked eighteenth with 64.00 MPS by the insured farmers. 'All States & Union Territories covered under the scheme' and 'non-loanee farmers covered under the scheme' were considered important knowledge aspect related to the insured farmers with 60.00 MPS and 57.00 MPS, respectively and accordingly ranked at nineteenth and twentieth position in the list of knowledge aspect related to insured farmers.

CONCLUSION

The insured farmers are required to increase the knowledge about various aspects of Pradhan Mantri Crop Insurance Scheme in order to avail the maximum benefits of the scheme. The finding of the study will be of utmost practical utility for farmers, decision makers, planners, administrators and field personnel involved in implementation of the crop insurance in India. After knowing weighted value of each of the delineated constraints, efforts can be rightly triggered to eliminate them in priority basis.

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ATTITUDE OF AGRICULTURAL RESEARCH SCHOLARS TOWARDS INTERNET IN MPUAT, UDAIPUR (RAJASTHAN)

B.S Bhimawat* and L.R. Choudhary**

ABSTRACT

The present study was purposively conducted in Rajasthan College of Agriculture. Udaipur due to the reason that this College is the oldest Agricultural College in Rajasthan state and enjoys more and adequate facilities of internet surfing for agricultural students, especially for research scholars at central library as well as in their respective departments and Hostels as compared to other Agricultural Colleges in Rajasthan. Considering the importance of the internet utilization the present investigation "Attitude and Utilization Pattern of Internet among the Research Scholars of Agriculture Science in MPUAT, Udaipur (Rajasthan) was conducted. The study revealed that majority of the research scholars had favourable attitude towards internet.

INTRODUCTION

The internet offers many options for computer users to communicate with others like chat, mail, telephone, browse special field for references and so on. The imperative necessity is to mount intense national as well as international efforts in the interest of achieving a bright common future by using the internet technology for all humanity on our planet. So for this purpose there is a need to develop human resources.

Internet has become a way of life for majority of higher education students all around the world. For most college students, the internet is a functional tool, one that has greatly changed the way they interact with each other and with information as they go about their studies. With internet many students prepare course assignments, make study notes, study themselves with specialized multimedia, and process data for research projects.

Most students exchange e-mails with faculty, peers, and remote experts. They keep up to- date in fields on the internet, accessing newsgroups, bulletin boards, and websites posted by professional organizations. Most students access library catalogs, bibliographic database, and academic resource in text, graphics and imagery on the World Wide Web.

The internet offers information more than the largest libraries in the world. Using internet in universities has a positive value and many universities around the world are also using internet for educational purposes for easy and effective teaching. The internet has become an essential part in education institution since it plays a vital role in meeting information and communication needs of students, teachers and institutions. The present study has been undertaken to study atitude of agricultural research scholars towards internet.

RESEARCH METHODOLOGY

The study was purposively conducted in Rajasthan College of Agriculture, MPUAT, Udaipur due to the reason that this college is the oldest Agricultural College in Rajasthan state and enjoys more and adequate facilities of internet surfing for agricultural students. From the RCA, Udaipur, a list of all the PG and Ph.D. research scholars was prepared from the student section of the college. There were 150 PG and 110 Ph. D research scholars i.e. a total of 260 research scholars registered in second semester during the session 2011-12. Out of which a sample of 117 respondents (90 male and 27 female) was taken for the study.

RESULTS AND DISCUSSION

A perusal of Table 1 Indicated that statement No. 1 "Knowledge of internet is essential for agricultural

*Director Extension, Agricultural University, Jodhpur (Rajasthan)
** Ph.D Student, Department of Extension Education, RCA, Udaipur (Raj.)

Table 1. The attitude of agricultural research scholars towards internet

n= 117

S. No.	Attitude statements	Male agriculture research scholars (n =90)							Female agricultural research scholars (n=27)						
		SA (5)	A (4)	N (3)	DA (2)	SDA (1)	MPS	Rank	SA (5)	A (4)	N (3)	DA (2)	SDA (1)	MPS	Rank
1	Knowledge of internet is essential for students	60 (66.67)	26 (28.89)	1 (1.11)	0 (0.00)	3 (3.33)	4.56	I	18 (66.67)	9 (33.33)	0 (0.00)	0 (0.00)	0 (0.00)	4.67	I
2	Internet is important like other research tools	39 (43.33)	41 (45.55)	8 (8.89)	1 (1.11)	1 (1.11)	4.29	II	11 (40.74)	16 (59.26)	0 (0.00)	0 (0.00)	0 (0.00)	4.41	IX
3	Internet is easier to use	22 (24.44)	48 (53.33)	15 (16.67)	4 (4.44)	1 (1.11)	3.95	XIV	9 (33.33)	16 (59.26)	1 (3.70)	0 (0.00)	1 (3.70)	4.18	XIX
4	Internet is as informative as teachers	31 (34.44)	28 (31.11)	20 (22.22)	7 (7.78)	4 (4.44)	3.83	XVIII	14 (51.85)	11 (40.74)	1 (3.70)	1 (3.70)	0 (0.00)	4.33	XI
5	Getting information from internet is enjoyable	36 (40.00)	34 (37.78)	14 (15.56)	6 (6.67)	0 (0.00)	4.11	V	15 (55.56)	11 (40.74)	1 (3.70)	0 (0.00)	0 (0.00)	4.52	V
6	Using internet in studies is overwhelming.	21 (23.33)	27 (30.00)	27 (30.00)	11 (12.22)	4 (4.44)	3.56	XXIX	14 (51.85)	4 (14.81)	7 (25.93)	1 (3.70)	1 (3.70)	4.07	XX
7	Internet is an integral part of the educational process	41 (45.55)	33 (36.67)	11 (12.22)	1 (1.11)	4 (4.44)	4.18	IV	14 (51.85)	12 (44.44)	1 (3.70)	0 (0.00)	0 (0.00)	4.44	VII
8	Using internet is comfortable	33 (36.67)	37 (41.11)	12 (13.33)	5 (5.55)	3 (3.33)	4.02	IX	11 (40.74)	7 (25.93)	4 (14.81)	0 (0.00)	5 (18.52)	3.70	XXXIV
9	Internet is difficult to use.	18 (20.00)	39 (43.33)	15 (16.67)	14 (15.56)	4 (4.44)	3.59	XXVIII	5 (18.52)	14 (51.85)	4 (14.81)	3 (11.11)	1 (3.70)	3.71	XXXIII
10	Using internet for important educational projects is not liked	26 (28.89)	37 (41.11)	13 (14.44)	10 (11.11)	4 (4.44)	3.78	XXII	9 (33.33)	8 (29.63)	8 (29.62)	1 (3.70)	1 (3.70)	3.85	XXVIII
11	Internet contains useless information	41 (45.55)	21 (23.33)	18 (20.00)	4 (4.44)	6 (6.67)	3.96	XIII	16 (59.26)	7 (25.92)	1 (3.70)	3 (11.11)	0 (0.00)	4.33	XIII
12	Using internet is not secured	21 (23.33)	21 (23.33)	25 (27.78)	22 (24.44)	1 (1.11)	3.43	XXXII	15 (55.55)	7 (25.92)	1 (3.70)	4 (14.81)	0 (0.00)	4.22	XV

Conti....

13	Internet use decreases the live time for discussion with friends	11 (12.22)	22 (24.44)	19 (21.11)	17 (18.89)	21 (23.33)	2.83	XXXXII	8 (29.63)	6 (22.22)	8 (29.63)	4 (14.81)	1 (3.70)	3.59	XXXVII
14	Internet is easy to understand	25 (27.78)	42 (46.67)	17 (18.89)	1 (1.11)	5 (5.55)	3.90	XVI	12 (44.44)	5 (18.52)	10 (37.04)	0 (0.00)	0 (0.00)	4.07	XXI
15	Internet is interactive	17 (18.89)	42 (46.67)	21 (23.33)	5 (5.55)	5 (5.55)	3.68	XXIV	9 (33.3)	16 (59.26)	1 (3.70)	1 (3.70)	0 (0.00)	4.22	XVI
16	Internet is credible	11 (12.22)	30 (33.33)	33 (36.67)	10 (11.11)	6 (6.67)	3.33	XXXIII	4 (14.81)	16 (59.26)	6 (22.22)	1 (3.70)	0 (0.00)	3.85	XXVII
17	Internet is Unbiased	20 (22.22)	21 (23.33)	20 (22.22)	21 (23.33)	8 (8.89)	3.27	XXXIV	8 (29.63)	12 (44.44)	6 (22.22)	1 (3.70)	0 (0.00)	4.0	XXV
18	Internet is more time saving as compared to conventional document	27 (30.00)	30 (33.33)	23 (25.55)	7 (7.78)	3 (3.33)	3.79	XX	20 (74.07)	4 (14.81)	3 (11.11)	0 (0.00)	0 (0.00)	4.63	II
19	Internet is more informative as compared to conventional document	32 (35.55)	38 (42.22)	16 (17.78)	3 (3.33)	1 (1.11)	4.08	VI	14 (51.85)	8 (29.63)	4 (14.81)	1 (3.70)	0 (0.00)	4.30	XIV
20	Internet is more useful as compared to conventional document	31 (34.44)	37 (41.11)	20 (22.22)	2 (2.22)	0 (0.00)	4.07	VIII	9 (33.33)	12 (44.44)	6 (22.22)	1 (3.70)	1 (3.70)	4.22	XVII
21	Internet is less expensive as compared to conventional document	21 (23.33)	36 (40.00)	16 (17.78)	13 (14.44)	4 (4.44)	3.63	XXVI	11 (40.74)	9 (33.33)	4 (14.81)	3 (11.11)	0 (0.00)	4.04	XXIV
22	Internet is more preferred as compared to conventional document	16 (17.78)	36 (40.00)	23 (25.55)	10 (11.11)	5 (5.55)	3.53	XXX	7 (25.93)	12 (44.44)	5 (18.52)	0 (0.00)	3 (11.11)	3.74	XXXII
23	Internet is accurate	27 (30.00)	40 (44.44)	17 (18.89)	5 (5.55)	1 (1.11)	3.97	XII	5 (18.52)	19 (70.37)	3 (11.11)	0 (0.00)	0 (0.00)	4.07	XXII
24	Internet is trustworthy	23 (25.25)	44 (48.89)	15 (16.67)	3 (3.33)	5 (5.55)	3.85	XVII	3 (11.11)	23 (85.19)	1 (3.70)	0 (0.00)	0 (0.00)	4.63	III
25	Internet is beneficial	22 (24.44)	38 (42.22)	22 (24.44)	6 (6.67)	2 (2.22)	3.80	XIX	6 (22.22)	20 (74.07)	1 (3.70)	0 (0.00)	0 (0.00)	4.18	XVIII
26	Internet has a potential to be an effective teaching/ training tool	23 (25.55)	30 (33.33)	21 (23.33)	11 (12.22)	5 (5.55)	3.61	XXVII	15 (55.55)	12 (44.44)	0 (0.00)	0 (0.00)	0 (0.00)	4.55	IV
27	Use of internet by students is just a waste of time and money	26 (28.89)	22 (24.44)	17 (18.89)	16 (17.78)	9 (10.00)	3.44	XXXI	18 (66.67)	6 (22.22)	1 (3.70)	1 (3.70)	1 (3.70)	4.44	VIII

Conti....

28	Internet facilitate to retrieve latest information through number of sources found	10 (11.11)	30 (33.33)	28 (31.11)	18 (20.00)	4 (4.44)	3.27	XXXV	3 (11.11)	13 (48.15)	11 (40.74)	0 (0.00)	0 (0.00)	3.70	XXXV
29	Internet use decreased the actual study-hours	5 (5.55)	28 (31.11)	16 (17.78)	27 (30.00)	14 (15.55)	2.81	XXXXIII	3 (11.11)	11 (40.74)	5 (33.33)	4 (14.81)	4 (14.81)	3.18	XXXIX
30	Internet services are cost- effective	33 (36.67)	40 (44.44)	10 (11.11)	5 (5.55)	2 (2.22)	4.08	VII	9 (33.33)	14 (51.85)	3 (11.11)	0 (0.00)	0 (0.00)	4.07	XXIII
31	Internet usage decreases the frequency of reading printed materials like books, journals, newspapers, etc	5 (5.55)	16 (17.78)	21 (23.33)	31 (34.44)	17 (18.89)	2.57	XXXXV	3 (11.11)	8 (29.62)	4 (14.81)	9 (33.33)	3 (11.11)	2.96	XXXXIII
32	Internet services facilitate improvement in system of communication	21 (23.33)	49 (54.44)	15 (16.67)	4 (4.44)	1 (1.11)	3.94	XV	14 (51.85)	12 (44.44)	1 (3.70)	0 (0.00)	0 (0.00)	4.48	VI
33	Internet had a positive impact on academic experience in general	25 (27.78)	47 (52.22)	14 (15.55)	2 (2.22)	3 (3.33)	4.02	X	3 (11.11)	16 (59.25)	7 (25.92)	1 (3.70)	0 (0.00)	3.78	XXX
34	Internet decreases the frequency of visit to library as well as preparing hand-writing note	4 (4.44)	12 (13.33)	14 (15.55)	42 (46.67)	18 (20.00)	2.36	XXXXIX	0 (0.00)	7 (25.92)	5 (18.52)	9 (33.33)	6 (22.22)	2.48	XXXXVII
35	Internet improve the professional competence of the students	25 (27.78)	28 (31.11)	30 (33.33)	6 (6.67)	1 (1.11)	3.78	XXI	7 (25.92)	11 (40.74)	8 (29.63)	1 (3.70)	0 (0.00)	3.89	XXVI
36	Internet expedited the research process conducted by students	23 (25.55)	33 (36.67)	20 (22.22)	9 (10.00)	5 (5.55)	3.66	XXV	8 (29.62)	8 (29.62)	7 (25.92)	4 (14.81)	0 (0.00)	3.74	XXXI
37	Internet is a good source to make friends	21 (23.33)	16 (17.78)	21 (23.33)	25 (27.78)	7 (7.78)	3.21	XXXVI	4 (14.81)	7 (25.92)	1 (3.70)	12 (44.44)	3 (11.11)	2.89	XXXXV
38	Internet use disturbs the social interaction with others	9 (10.00)	26 (28.89)	22 (24.44)	21 (23.33)	12 (13.33)	2.99	XXXVIII	0 (0.00)	8 (29.63)	11 (40.74)	5 (18.52)	3 (11.11)	2.89	XXXXVI
39	Internet use decreases the participation in the extra-curricular activities of the college/university	1 (1.11)	15 (16.67)	25 (27.78)	32 (35.55)	17 (18.890	2.46	XXXXVII	1 (3.70)	5 (18.52)	4 (14.44)	9 (33.33)	8 (29.63)	2.33	XXXXIX
40	Due to internet use, health related problems like eye pain, back pain, neck pain etc are caused	1 (1.11)	38 (42.22)	22 (24.44)	22 (24.44)	13 (14.44)	3.11	XXXVII	0 (0.00)	5 (18.52)	7 (25.92)	8 (29.62)	7 (25.92)	2.37	XXXXVIII

Conti....

41	Internet create addiction	11 (12.22)	20 (22.22)	23 (25.55)	22 (22.44)	14 (15.55)	2.91	XXXX	1 (3.70)	10 (37.04)	5 (18.52)	11 (40.74)	0 (0.00)	3.04	XXXXII
42	Internet is harmful for the culture	2 (2.22)	18 (20.00)	26 (28.89)	27 (30.00)	17 (18.89)	2.57	XXXXVI	0 (0.00)	9 (33.33)	7 (25.92)	11 (40.74)	0 (0.00)	2.92	XXXXIV
43	Internet use has disturbed the sleeping pattern erratically	5 (5.55)	10 (11.11)	23 (25.55)	30 (33.33)	22 (24.44)	2.40	XXXXVIII	4 (14.44)	8 (29.63)	4 (14.44)	10 (37.04)	1 (3.70)	3.15	XXXX
44	Internet use has increased the dependency on internet	10 (11.11)	15 (16.67)	17 (18.89)	32 (35.55)	16 (17.78)	2.78	XXXXIV	3 (11.11)	11 (40.74)	4 (14.44)	5 (18.52)	4 (14.44)	3.15	XXXXI
45	Internet forces the people to be alone	10 (11.11)	23 (25.55)	23 (25.55)	20 (22.22)	14 (15.55)	2.94	XXXIX	8 (29.63)	4 (14.44)	11 (40.74)	3 (11.11)	1 (3.70)	3.55	XXXVIII
46	It is enjoyable to chat on internet	31 (34.44)	35 (38.89)	17 (18.89)	6 (6.67)	1 (1.11)	3.99	XI	4 (14.81)	15 (55.55)	7 (25.92)	1 (3.70)	0 (0.00)	3.81	XXIX
47	It is not safe to make shopping, banking etc at internet	12 (13.33)	20 (22.22)	23 (25.55)	17 (18.88)	18 (20.00)	2.90	XXXXI	4 (14.48)	12 (44.44)	8 (29.62)	3 (11.11)	0 (0.00)	3.63	XXXVI
48	Internet provides easy life	23 (25.55)	33 (36.67)	21 (23.33)	10 (11.11)	3 (3.33)	3.70	XXIII	11 (40.74)	15 (55.55)	1 (3.70)	0 (0.00)	0 (0.00)	4.37	X
49	Internet is a faster way to acquire knowledge	42 (46.67)	31 (34.44)	12 (13.33)	5 (5.55)	0 (0.00)	4.22	III	16 (59.26)	7 (25.92)	1 (3.70)	3 (11.11)	0 (0.00)	4.33	XXII

SA = Strongly agree A = Agree N = Neutral DA = Disagree SDA = Strongly disagree

Rank correlation coefficient (rs) = 0.76 t= 8.02 (significant at 0.01 level of probability)

Tabulated value of t at 0.0 level of probability with 47 degrees of freedom = 1.68

research scholars" had secured the first rank by both male (MS 4.56) and female (MS 4.67) agricultural research scholars as it was strongly agreed by 66.67 per cent agricultural research scholars. Thus, most of the agricultural research scholars had favourable attitude toward this statement.

This is inferred from the data that as most of the information is available on internet but to get it, it is necessary to know how to browse. Agricultural research scholars get their class notes, research information, and sending application for job through internet and to do so the internet knowledge was considered important by both male female agricultural research scholars.

In the similar way the statement entitled "Internet is important like other research tools" had been awarded the second rank in order of preference of both the male (MS 4.29) and female (MS 4.63) agricultural research scholars. This implies that as research scholars deals mostly with research, they found internet very important in getting information as printed materials for their assignment, thesis work etc. The statement no 49 "Internet is a faster way to acquire knowledge" had been awarded the third rank in order of preferences of male agricultural research scholars (MS 4.22) and tenth rank of the preference for female agricultural research scholars (MS 4.33). In case of female research scholars the statement "Internet services are cost effective" (MS 4.55) was ranked third in their preference whereas in case of male agricultural research scholars (MS 4.08) the same statement had been ranked seventh in their preference.

On the other side, the statement no. 34 "Internet decrease the frequency of visit to library as well as preparing hand written notes" got the lowest mean score (MS 2.37) by the male agricultural research scholars and had been ranked 49th means last, whereas the same statement had been ranked 47th by the female agricultural research scholars (MS 2.48). The female agricultural research scholars on their preference ranked the statement "Internet use decreases the participation in the extra curricular activities at 49th rank means last position with MS 2.33 and the same statement were ranked at 47th position by male agricultural research scholars with MS 2.46.

The other statement, which got next lowest rank i.e. 47th rank by female agricultural research scholars (MS 2.37) was "Due to internet use health related problems like eye pain, neck pain etc are caused" whereas this was awarded 37th rank by male agricultural research scholars. The probable reason behind such findings might be that as the female still young and have never feel such problem even though they are using internet and now a day most of research scholars are using Laptop in their room and on their bed and are using it at their convenience while browsing

CONCLUSION

It is concluded that majority of the male and female agricultural research scholars had favourable attitude towards internet and were of the opinion that the "Knowledge of internet is essential for agricultural research scholars".

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ANALYSIS OF RURAL SOCIAL PROBLEMS

Shubham Mishra*, Rajneesh and Hemant Jingonia*****

ABSTRACT

About 75 per cent of Indian population earn their livelihood directly or indirectly from agriculture.Owing to poor income from agriculture that resulted in increased indebtedness, widespread suicides of farmers have been reported in different parts of country. This study attempt to analysis the major challenges of Indian agriculture. The Government of India also launched the programme doubling the income of farmers by the year 2022 in light of evidence of agrarian distress. This analysis will be helpful for increase the farm income in a sustained manner.

INTRODUCTION

A notable contribution in the recent literature on farm incomes in India is by Chand et al (2015), who suggested that "growth in farm income after 2011-12 has plummeted to around 1 per cent, and this is an important reason for the sudden rise in agrarian distress in recent years." Although over two?third of population are relying on agricultural sector for their livelihood, farm income related issues have somehow not received adequate attention in the policy circle till late nineties (Deshpande et al., 2004; Sen and Bhatia, 2004). The scholars and policy makers began to take a serious note of this agrarian catastrophe only when the distress resurfaced again in the recent years in the farm heartlands of the country (Sainath, 2010). Serious deliberations on the issue of farm income and crop profitability have occupied the centre stage in the recent policy debates on agricultural sector especially from early 2000s. According to data collected and results of National Sample Survey Office's (NSSO) Situation Assessment Survey of Farmers conducted in 2003 (hereafter referred to as the 2003 survey) and Situation Assessment Survey of Agricultural Households 2013 (hereafter referred to as the 2013 survey). Following this, many researchers also conducted detailed field level studies in this direction and have reported that decline in productivity, supply constraints in institutional credit, market irregularities, etc., are the major reasons for the sudden spurt in farm suicides and indebtedness (Deshpande, 2002; Deshpande and Prabhu, 2005; Reddy and Galab, 2006; Vaidyanathan, 2006; Narayanamoorthy 2006).

METHODOLOGY

After the publication of SAS data, quite a few studies have been carried out specifically focusing on farm income. SAS provides data on the annual income for farmer households by various sources namely wages, cultivation, farming of animals and non?farm business income. But unfortunately, farmers belonging to the irrigated region have also committed suicides citing poor returns from crops cultivation in the recent years. Farmers in Andhra Pradesh belonging to highly irrigated region have even declared `crop holiday' specifically because of poor income from farming. Given this unpleasant developments, there is a need to validate whether irrigated farmers reap higher profit than their less irrigated counter parts. Using this data, the actual level of farm income reaped by the Indian farmers can be easily judged. Statistics provided in Table 1 show that the average income from the cultivation for the States Having Above National Level Irrigation (SHANLI) is not substantially different from that of the States Having Below National Level Irrigation (SHBNLI) at both time points namely 2002?03 and 2012?13. The average growth of cultivation income for the whole of India is estimated to be about 3.81 percent per annum between 2002-03 and 2012-13, but it was less than that of the India's average growth rate in 11 out of 18 states reported in the Table 1. To our surprise, the growth rate of income from cultivation was negative in states like J&K, Jharkhand, Bihar and West Bengal. This poor growth in income from cultivation might have affected the livelihood conditions of the farmers living in these states. The analysis based on the data available from

*Ph.D. Scholar at MPUAT, Udaipur Corresponding author e-mail: krishnaagrian.1990@gmail.com
**Ph.D. Scholar at MPUAT, Udaipur Corresponding author e-mail: krishnaagrian.1990@gmail.com
***Ph.D. Scholar at MPUAT, Udaipur Corresponding author e-mail: krishnaagrian.1990@gmail.com

SAS clearly shows that the income from cultivation per farmer household was very low.

According to analysis on "Doubling Farmer's Incomes by 2022" carried out by S. Chandrasekhar, Nirupam Mehrotra (2016) five issues that need attention in order to improve the livelihoods of farmer households are: increasing agricultural productivity, remunerative prices for farmers, focus on land leasing and land titles, risk adaptation and mitigation and a geographical focus on the eastern region.

RESULTS AND DISCUSSION

Indian Agriculture Major Challenges: While the contribution of agriculture to GDP fell from 28.3 per cent in 1993-94 to 13.9 per cent in 2013-14 it continues to support half of the work force in the country (the employment share declined from 64.85 during 1993-94 to 48.9 per cent in 2011-12) (NITI Aayog, 2015; GOI and OUP 2014). Even more importantly, the poorest of the poor are still dependent on agriculture for their livelihoods.

Some of the major issues in Indian agriculture that emerges out of several studies covering different regions and time periods are discussed below.

1. Small size of holdings

Small holders (less than 2.00 hectares) constitute 83% of total land holdings and cultivate 42% of operated land (Chand, R., Prasanna, P.A.L., Aruna, S, 2011). Small land holdings restrict the farmer to use traditional methods of farming and limit productivity. As land holdings are small, more people invariably work on the farms in the rural areas and coupled with the obsolete technology, farm incomes come down.This act as a major constraint in availing the benefits of economies of scale in access to and utilization of major inputs (land, labour, human and machine, irrigation, fertilizer, credit, technology) and realizing remunerative prices from markets for their produce (Harriss-White (2004) ; Agarwal, B (2011). This further exacerbates their situation as poor households and in the aggregate level results in higher levels of incidence of poverty when compared to medium and large farmers.

2. Low productivity levels

Even with considerable investments in technology generation, transfer of technology and various forms of input and output support programmes and policies, the productivity levels in majority of important crops remain very low compared with Global productivity levels. India's yield levels are lower by 46 per cent and 39 per cent respectively when compared to China (GOI, 2016). Although the natures and extent of various constraints vary, India needs to focus its effects in bridging yield gaps.

3. Shrinking land and water resource base

Fueled by rapid industarlization, urbanization and climate change, the resource base critical for agricultural production (primary land and water available for cultivation) is shrinking at an alarming rate (GOI, 2016). This clearly will have serious implications in the sustainability and production potential of agriculture systems eroding the foundations of food and nutritional security. (FAO and Earthscan, 2011).

4. Climate Change and Associated Risk and Vulnerability

Studies have shown that changing climate (inadequate and unequal distribution of rainfall, rise and fluctuations in temperature, raising sea levels, increase in frequency of natural calamities etc.) has adverse effects on the agricultural production systems threatening food and nutritional security of vulnerable communities, particularly the small holders (Swaminathan, M.S., Regalakshmi, R, 2016). Though the nature and extent of impact may vary with regions and communities, farming community, particularly small holders are ones who are more vulnerable and risk prone.

5. Segmentation of agricultural markets

The levels of segmentation of agriculture markets for outputs rode the benefits through competition, efficient resource allocation, specialization in subsectors and fewer intermediaries. This creates wide gaps in farm gate and wholesale prices and between wholesale and retail prices resulting in welfare losses for producers as well as consumers.

6. Irrigation problems

Most of the farming in India is monsoon dependent - if monsoons are good, the entire

Table 1: Average Annual Income per Farmer Household by Source across major Sates during 2002-03 and 2012-13

(Rs/ha at 1986-87 prices)

State	2002-03					2012-13					Compound Growth Rate (percent/annum)				
	Wages	Cultivation	Farming of Animals	non-Farm Business	Total	Wages	Cultivation	Farming of Animals	non-Farm Business	Total	Wages	Cultivation	Farming of Animals	non-Farm Business	Total
1. Andhra Pradesh	2419	2795	350	583	6147	4432	3611	1920	714	10677	5.66	2.36	16.74	1.86	5.15
2. Assam	3660	6741	530	959	11891	2554	7520	1427	455	11955	-3.22	1.00	9.41	-6.55	0.05
3. Chhattisgarh	2667	3051	-11	380	6087	3300	5977	-34	2	9245	1.95	6.30	00	-38.57	3.87
4. Gujarat	3480	4379	1712	527	10097	4791	5238	3446	679	14154	2.95	1.64	6.57	2.33	3.12
5. Jammu & Kashmir	7749	9126	1437	2332	20645	13100	5470	1430	2648	22648	4.89	-4.55	-0.04	1.16	0.85
6. Jharkhand	3476	3205	324	779	7783	3284	2591	2130	425	8430	-0.52	-1.91	18.69	-5.36	0.73
7. Karnataka	3954	4762	493	632	9841	4780	8804	1071	1116	15771	1.74	5.74	7.32	5.31	4.38
8. Kerala	7572	4213	579	2697	15062	9382	6305	1027	4516	21229	1.97	3.73	5.34	4.80	3.17
9. Madhya Pradesh	2107	3747	-854	380	5379	2379	7171	1307	230	11089	1.11	6.08	00	-4.45	6.80
10. Maharashtra	3006	4751	542	967	9265	3850	6886	963	1489	13189	2.28	3.43	5.36	4.01	3.26
11. Orissa	2155	1264	60	515	3995	3064	2513	2346	963	8886	3.25	6.44	39.52	5.84	7.54
12. Rajasthan	3502	1350	19	764	5635	4525	5604	1727	1268	13125	2.36	13.81	50.81	4.72	7.99
Average of SHBNLI	**3812 (40.91)**	**4115 (44.16)**	**432 (4.63)**	**960 (10.30)**	**9319 (100)**	**4953 (37.06)**	**5641 (42.20)**	**1563 (11.70)**	**1209 (9.04)**	**13367 (100)**	**2.41**	**2.91**	**12.41**	**2.12**	**3.33**
13. Bihar	1870	3182	997	760	6809	2363	3063	498	429	6354	2.15	-0.35	-6.11	-5.07	-0.63
14. Haryana	4770	5620	-888	1339	10841	6234	14048	4723	770	25775	2.46	8.69	00	-4.91	8.19
15. Punjab	5500	10616	888	1655	18658	8534	19396	2961	1357	32248	4.08	5.63	11.57	-1.79	5.10
16. Tamil Nadu	4157	2479	414	745	7794	5182	3423	1964	1895	12464	2.02	2.98	15.21	8.86	4.36
17. Uttar Pradesh	2103	3145	199	696	6143	2054	5098	970	671	8791	-0.22	4.49	15.46	-0.33	3.31
18. West Bengal	3337	2772	290	1422	7821	3796	1748	402	1161	7107	1.18	-4.11	3.02	-1.83	-0.87
Average of SHANLI	**3623 (37.43)**	**4636 (47.90)**	**317 (3.27)**	**1103 (11.40)**	**9678 (100)**	**4694 (30.37)**	**7796 (50.44)**	**1920 (12.42)**	**1047 (6.77)**	**15457 (100)**	**2.38**	**4.84**	**17.80**	**-0.47**	**4.35**
All India	**3081 (38.72)**	**3645 (45.82)**	**342 (4.30)**	**888 (11.16)**	**7956 (100)**	**3698 (32.23)**	**5502 (47.95)**	**1363 (11.87)**	**914 (7.97)**	**11475 (100)**	**1.67**	**3.81**	**13.38**	**0.27**	**3.39**

Sources: NSSO (2005a; 2014).

Notes: SHANLI - States having above national level of irrigation coverage in 2002-03; SHBNLI-States having below national level of irrigation coverage in 2002-03; Figures in brackets are percentages to total income.

economy (and not just the agricultural sector) is upbeat and when the monsoon fails, everyone everywhere takes a hit to some extent. The problem here is of proper management of water or the lack of it. Irrigation which consumes more than 80 per cent of the total water use in the country needs a proper overhaul if the country has to improve agricultural output and boost the overall economy.

7. Seed problems

Most of the farmers - especially the poor and marginal ones - are dependent on seeds sold in the market. Moreover, the HYV seeds as well as the GM seeds which promise higher yields force the farmers to buy seeds for every crop. With spurious seeds hitting the market, the farmers' woes have exceeded all limits. Sometimes seeds do not give the stated/ claimed yields and farmers run into economic troubles. A proper regulation/legislation to hold seed companies accountable for false claims is the need of the hour as companies use legal loopholes to push the blame on to the farmers in the case of failed crops.

8. Sustainability problems

Sustainability in agriculture is of utmost importance as many problems faced by farmers are related to this. Excess fertilizer usage not only makes the plants dependent on artificial fertilizers but also erodes the land quality, polluted ground water and in case of a surface runoff, pollutes the nearby water bodies. Lack of proper understanding of the need to grow crops sustainably will push farmers into a vicious circle - of debts, heavy use of fertilizers, water mismanagement, low productivity and thus, more debts for the next cycle.

9. Rural women

Rural women tend to suffer far more than rural men. Their poverty and low social status in most societies is a major contributor to chronic poverty. Substantial evidence from many countries shows that focusing on the needs and empowerment of women is one of the keys to human development.

CONCLUSION

According to analysis of information gathered the rural people face many different problems. Therefore, a sustained effort must be made to gather information about the particular problems they face so that they can be adequately addressed. The rural poor cannot make the best use of their resources, including human capital, because the quantity or the quality of some of the key parts of the country's physical infrastructure (irrigation, transport, and communications) and support services (research and extension) is inadequate. The social and physical infrastructure and services can be funded and maintained best-that is, they will be cost-effective and of reasonable quality-if the target groups are involved in designing, implementing, and monitoring them, as well as in ensuring accountability of the government officials responsible for them.When proper techniques in water management, as well as a crop plan of what to produce and where to produce, Scientific research to improve seeds quality and availability that will help the farmers in boosting the yields, Sometimes small innovations at the grass root levels can solve a host of problems specific to a particular region and district agricultural officers must make it a habit to encourage such ideas and also take part in knowledge sharing to implement the ideas at a regional, state and national levels are employed, it will be a win - win situation for both the farmers as well as the country.

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KNOWLEDGE LEVEL OF MANGO ORCHARDISTS ABOUT ECO-FRIENDLY MANAGEMENT PRACTICES OF MANGO

R.P. Mahadik*, N.K. Punjabi, F.L. Sharma*** and B. Upadhyay******

ABSTRACT

The present study was conducted in Ratangiri and Sindhudurg districts of south konkan in Maharashtra to knowledge level of the mango growers about eco-friendly management practices. By interviewing 200 mango orchardist, it was observed that majority of mango orchardists were having the 'medium' level of knowledge level. Maximum knowledge was reported in 'variety' of mango while the minimum knowledge was observed in case of 'post-harvest management of pest and diseases' by all the types of mango growers. There was a significant correlation between small and big orchardists with regard to ranks assigned to different aspect of knowledge about eco-friendly management practices of mango. Findings indicated that the mean value further indicates that big orchardists had higher knowledge than small orchardists about eco-friendly management practices.

INTRODUCTION

Knowledge, as a body of understood information possessed by an individual, is one of the important components of adoption; even it has been considered by many extension scientists as pre-requisite for adoption. In order to increase the level of adoption, mango orchardist must be made aware of the recent knowledge about eco-friendly management practices. Hence, it was imperative to examine the extent of knowledge of small and big orchardists about eco-friendly management practices of mango with following specific objectives.

1. To study the knowledge level of mango orchardists about eco-friendly management practices of mango.
2. To study the aspect-wise knowledge of mango orchardists about eco-friendly management practices of mango.

RESEARCH METHODOLOGY

The present study was conducted in Ratanagiri and Sindhudurg districts of south Konkan in Maharashtra. The two districts, four tehsils and 20 villages were selected on the basis of maximum area under mango cultivation. Ten mango orchardists were selected randomly from each village. The 200 mango orchardist were interviewing with special designed interview schedule. The statistical tools percentages, Standard deviation, frequency and rank correlation were used.

RESULTS AND DISCUSSION

The results are presented herewith as below:

1. Knowledge level of mango orchardists about eco-friendly management practices of mango

To get an overview of the knowledge level, the respondents were grouped into three categories namely low, medium and high on the basis of calculated mean and standard deviation of the knowledge scores obtained by the respondents. The category-wise distribution of respondents category is presented in Table 1.

It is seen from Table 1 that majority (70%) of mango orchardists were having the 'medium' level of knowledge, while 16 per cent and 14 per cent respondents were having 'low' and 'high' knowledge level, respectively. The average knowledge score was 39.60 indicating 'medium' level of knowledge of total mango orchardist about eco-friendly management practices.

In case of small mango orchardists 69 per cent, 22 per cent and 9 per cent respondents were having 'medium', 'high' and 'low' knowledge level,

*Ex. Ph.D. Scholar, Department of Extension Education, RCA, Udaipur.
** Ex. Professor, Department of Extension Education, RCA, Udaipur.
***Professor, Department of Extension Education, RCA, Udaipur.
****Professor, Department of Statistics, RCA, Udaipur.

Table 1: Distribution of respondents on the basis of knowledge about eco-friendly management practices of mango

S. No.	Knowledge level	Small orchardists		Big orchardists		Total	
		F	%	F	%	F	%
1.	Low (< 34)	22	22.00	10	10.00	32	16.00
2.	Medium (34 to 45)	69	69.00	71	71.00	140	70.00
3.	High (> 45)	9	9.00	19	19.00	28	14.00
	Total	**100**	**100**	**100**	**100**	**200**	**100**
	Average (score)	**38.24**		**40.97**		**39.60**	

F = Frequency, %= Percentage

respectively, while 71 per cent, 19 per cent and 10 per cent big mango orchardist, were having 'medium', 'high' and 'low' knowledge level about eco-friendly management practices, respectively. Thus, it may be concluded that big mango orchardists possessed higher knowledge than small orchardists.

These findings are in line with the findings of Bite (2012), who found that majority (75.50%) of the respondents had 'medium' knowledge about resource sustaining agricultural practices, while 15 per cent of the respondents had 'high' knowledge and few (9.50%) respondents had 'low' knowledge about resource sustaining agricultural practices. The mean knowledge score about resource sustaining agricultural practices was 81.17 which indicated medium level of knowledge of the respondents.

2. Aspect-wise knowledge of mango orchardists about eco-friendly management practices of mango

The aspect-wise knowledge of eco-friendly management practices of mango among the orchardists is presented in Table 2.

A perusal of data in Table 2 clearly visualized that the perfect knowledge of mango variety suitable for cultivation was possessed by both the category of orchardists and was accorded 1st rank. Grading, packaging and transport was accorded 2nd rank with little more difference between two categories. Similarly irrigation management, planting & after care and harvesting were accorded third, fourth and fifth rank in the rank order with MPS of more than 80 per cent. Unfortunately, the knowledge about soil and climate, manures & fertilizers, plant protection, nutritional deficiency & physiological disorder management were reported with lower rank from sixth to ninth, which in turn indicates the knowledge gap among the orchardists regarding these important eco-

Table 2: Knowledge of eco-friendly management practices among the respondents

S. No.	Practices	Small orchardists		Big orchardists		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Soil and climate	72.00	6	74.50	6	73.25	6
2.	Variety	99.67	1	100.00	1	99.83	1
3.	Planting and after care	82.25	4	87.50	4	84.88	4
4.	Irrigation management	90.25	3	96.00	2	93.13	3
5.	Intercropping	21.66	10	26.67	11	24.17	10
6.	Manure and fertilizers	59.83	7	65.25	7	62.54	7
7.	Plant protection	51.86	9	58.71	8	55.29	8
8.	Nutritional deficiency and physiological disorder management	53.67	8	56.00	9	54.84	9
9.	Harvesting	81.20	5	84.56	5	82.87	5
10.	Grading, packaging and transport	91.00	2	95.67	3	93.34	2
11.	Post- harvest management for pest and diseases	9.67	11	29.00	10	19.34	11

$r_s = 0.9818^{**}$

MPS= Mean per cent score
** = significant at 1 per cent level of significance

friendly management practices.

With the results at hand, it can be concluded that the practice like post-harvest management for pest & diseases and intercropping are the areas where maximum gap exist which needs to be bridged by suitable efforts of concerned agencies.

To find out the correlation if existed between ranks accorded by two categories of orchardists for the listed practices was worked out. It was found that the rank correlation value 0.9818 was significant at 1 per cent level. This infers that the knowledge level of both categories of respondents regarding eco-friendly management practices was at par.

The findings are in line with findings of Mohammad (2000) who observed that guava orchard owners had maximum knowledge about improved varieties (100%) followed by planting (67.22%), cultural practices (66.66%), harvesting and marketing (65.33%) and propagation (55.55%). Comparatively less knowledge was found in plant protection measures (47.91%) among the guava orchard owners.

3. Comparison of knowledge between small and big orchardists about eco-friendly management practices of mango

Besides study of overall knowledge level of mango orchardists of the study area, efforts were made to find out the significance of difference between small and big orchardist about eco-friendly management practices of mango. To find out the difference in the knowledge of the respondents 'Z' test was applied. The results are presented in Table 3 as below.

Table 3: Comparison of knowledge between small and big orchardists about knowledge of eco-friendly management practices of mango

S.No.	Category of Respondents	Mean	S.D	'Z' Value
1.	Small mango orchardists	38.24	4.91	3.67**
2.	Big mango orchardists	40.97	5.56	

** Significant at 1 per cent level of significance

The data in Table 3 shows that the calculated 'Z' value was found to be greater than its tabulated value (1.95) at 1 per cent level of significance. It could be inferred that there is significant difference in knowledge between small and big orchardists about knowledge of eco-friendly management practices of mango. The mean value indicates that big mango orchardists had higher knowledge than small orchardists about eco-friendly management practices of mango. This difference in the level of knowledge of mango growers might be due to the reason that big orchardists are better exposed, more innovative and capable of spending more money for acquiring inputs and knowledge.

The present findings are in line with the findings of Singh (2010) who observed that there was significant difference in knowledge among tribal and non-tribal mango growers regarding improved mango cultivation.

CONCLUSION

The knowledge of the respondents about eco-friendly management practices was found to be average in case of majority of orchardists. There exists a tremendous knowledge gap which needs to be bridge on priority basis. It is therefore recommended that the agencies working for production and promotion of mango in the study area should come forward and make efforts to enhance the knowledge of orchardists. Since it concern with eco-friendly management practices, the special efforts are required. The area like post-harvest management for pest and diseases, intercropping, nutritional deficiency and physiological disorder management where the knowledge level was reported low, is a matter serious concern and requires initiation of educational drives for mango orchardists in the study area.

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ATTITUDE OF BENEFICIARY FARMERS TOWARDS NATIONAL HORTICULTURE MISSION

Kishan Singh*, S.S. Shekhawat, Amit Kumar*** and J.P. Lakhera******

ABSTRACT

The present investigation was conducted in randomly selected Mehsana district of Gujarat state to know the Attitude of beneficiaries about National Horticulture Mission and its relation with their profile. The data were collected personally with the help of structured interview schedule from 120 respondents from three randomly selected talukas of the district. It was observed that majority of the beneficiaries of National Horticultural Mission were middle aged, educated up to secondary school and having large land holding and occupation farming. Regarding experience in horticulture, extension contact, source of information, economic motivation risk orientation, overall awareness majority of them were under medium category and neutral Attitude of National Horticultural Mission, It was observed that out of ten independent variables, age, land holding, experience in horticulture, extension contact, sources of information, economic motivation, risk orientation and overall awareness had positive and significant relationship with Attitude, while education and occupation has negative and significant relationship with Attitude.

INTRODUCTION

The National Horticulture Mission has provided a fillip to the horticulture sector, resulting in a significant increase in Horticulture business activities, besides bringing in vibrancy in the agricultural economy. It focus in the area of horticultural research development, post harvest management, processing and marketing. The programme under horticultural development aims at increasing the production and productivity of all horticultural crops through timely adoption of improved technologies in crop production. Governments of India focus more attention towards horticultural programmes for providing relief and rescue measures to the small and marginal farmers through National Horticulture Mission.

So with aim to know the Attitude of farmers towards National Horticultural Mission, the present investigation was undertaken with the objectives : to study socioeconomic and personal characteristics of the beneficiaries of National Horticultural Mission, to know the extent of Attitude of the beneficiaries about National Horticultural Mission and to find out relationship between socio-economic and personal characteristics of the beneficiaries with their Attitude about National Horticultural Mission

RESEARCH METHODOLOGY

The present investigation was conducted in randomly selected Mehsana district of Gujarat state. Mehsana district is composed of 9 tatuka. From which three taluka viz. Mehsana, Kheralu and Satlasana were selected randomly. Four villages from each selected taluka were selected randomly. From each selected village ten beneficiaries by making sample of 120 respondents of National Horticultural Mission which had implemented this scheme in year 2005 were selected randomly. The data from selected 120 beneficiaries were collected by contacting them personally through structured interview schedule. Frequencies, percentage, standard deviation, correlation coefficient, were employed to find out the results.

RESULTS AND DISCUSSION

Socio-economic and personal characteristics of the beneficiaries of National Horticultural Mission: It can been seen from Table 1 reveals that majority of respondents (75.00%) were from middle age group

*PG. Scholar, Department of Extension Education, College of Agriculture, SDAU, Dantiwada, Gujrat, India
**Professor, Department of Extension Education, College of Agriculture, SDAU, Dantiwada, Gujrat, India
***Ph.D Scholar, Department of Extension Education, College of Agriculture, SKRAU, Bikaner (Rajasthan)
****Professor & Head, Department of Extension Education, College of Agriculture, SKRAU, Bikaner (Rajasthan)

followed by old age group (22.50%) and young age group (02.50%). Majority of respondents were educated up to secondary school level (37.50%), followed by higher secondary level (29.17%). While, 28.33 per cent of them were educated graduation and above. It was further noticed that 3.33 per cent respondents were illiterate and (1.67%) were educated only primary education.

It is also observed from Table 1 that slightly more than half (5 1.67%) belonged to mediuin size family followed by near about two fifth (39.17%) of respondent were from small family. Only one tenth (9.16%) were from big families.

Table 1 further indicates that three fourth (75.00%) of the beneficiaries of National Horticulture Mission had medium experience in horticultural crop farming whereas, 13.33 per cent and 11.67 per cent of them had low and high experience in horticulture respectively. Majority of respondents nearly half (45.00%) of the beneficiaries of National Horticulture Mission were possessed large land holding farmers .Whereas 30.00 per cent and 23.33 per cent and 01.67 per cent of them possessed medium, small and marginal size of land holding, respectively.

In case of occupation, it was noticed that farming was prime occupation for most (68.33%) of the farmers in study area. Followed by subsidiary occupation, 24.17 per cent and 7.50 per cent of the respondents were engaged in farming along with animal husbandry and farming along with business, respectively. In case of extension contact, 49.17 per cent of respondents had medium extension contact, However, 26.67 per cent had high and 24.16 per cent were having low extension contact. Table 1 clearly indicates that great majority of the respondents (70.83%) were using medium number of sources of information, followed by 17.50 per cent of respondents were using low number of sources of information. Only 14 respondents (11.67%) were using sources of information to high extent.

In case of Economic motivation, it was noticed that nearly three fourth (70.83%) of the beneficiary respondents belonged to medium economic motivation category. Whereas, less than one fifth (14.17%) and more than one tenth (15.00%) of the beneficiaries had low and high economic motivation. Table 1 clearly shows that 79.17 per cent of the respondents were having medium risk bearing ability, followed by 10.83 per cent of the respondents were with high risk bearing ability and one tenth (10.00%),respectively. These findings are consistent with the observations of Hiremath (1993), Sinha (1984). Sharnagat (2008), Pise (2006), Meshram (2006), Ramakrishna (1986), Gopalan (1988).

Awareness of the respondents about National Horticultural Mission: Table 2 indicates that most of the respondents (46.67%) were having high level of awareness about National Horticultural Mission, followed by 27.50 per cent of respondents were with medium level of awareness. 25.83 per cent of the respondents were having low level of awareness. These results are in agreement with the findings of Ramakrishna (1986) and Gopalan (1988).

Relationship between personal characteristics of beneficiary farmers and their attitude towards National Horticulture Mission: From Table 3 reveals that land holding (0.2614) and extension contact (0.2671) had positive and significant correlation with attitude of beneficiaries towards National Horticulture Mission. The variables like age (0.1254), experience in horticulture (0.1014), Sources of information (0.1554), economic motivation (0.0536) and risk orientation (0.0798) shows positive and non-significant relationship with attitude of beneficiaries

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

(N=120)

S. No.	Category	Frequency	Percentage
Age			
1	Young	03	02.50
2	Middle	90	75.00
3	Old	27	22.50

Cont...

Education			
1	Illiterate	04	03.33
2	Primary education	02	01.67
4	Secondary education	45	37.50
4	Higher secondary education	35	29.17
5	Graduation and above	34	28.33
Experience in horticulture			
1	Low	16	13.33
2	Medium	90	75.00
3	High	14	11.67
Land holding			
1	Marginal	02	01.67
2	Small	28	23.33
3	Medium	36	30.00
4	Large	54	45.00
Occupation			
1.	Farming	82	68.33
2	Farming with Animal husbandry	29	24.17
3	Farming with business	09	7.50
Extension contact			
1	Low extension contact	32	26.67
2	Medium extension contact	59	49.17
3	High extension contact	29	24.16
Sources of information			
1	Low	21	17.50
2	Medium	85	70.83
3	High	14	11.67
Economic motivation			
1	Low economic motivation	17	14.17
2	Medium economic motivation	85	70.83
3	High economic motivation	18	15.00
Risk orientation			
1	Low risk orientation	12	10.00
2	Medium risk orientation	95	79.17
3	High risk orientation	13	10.83

towards National Horticulture Mission. While, variables like, education (-0.0252) and occupation (-0.1174) had negative and non-significant relationship with attitude of beneficiaries towards National Horticulture Mission.

Table 2: Distribution of beneficiaries according to their overall awareness

S. No.	Category	Respondents	
		Freq-uency	%
1	Low awareness (less than 22.31 score)	31	25.83
2	Medium awareness (between 22.31 to 23.41 score)	33	27.50
3	High awareness (more than 23.41 score)	56	46.67
	Total	**120**	**100.00**

Table 3 : Relationship between the characteristics of beneficiaries and the attitude towards National Horticulture Mission

S. No.	Independent Variables	Correlation Coefficient ('r' value)
1.	Age	0.1254
2.	Education	-0.0252
3.	Occupation	-0.1174
4.	Land holding	0.2614*
5.	Experience in horticulture	0.1014
6.	Extension contact	0.2671*
7.	Sources of information	0.1554
8.	Economic motivation	0.0536
9.	Risk orientation	0.0798
10.	Awareness	0.1001

CONCLUSION

It can be concluded that majority of the respondents possessed positive attitude towards National Horticulture Mission. It was further noted that age, land holding, experience in horticulture, extension contact, sources of information, economic motivation, and risk orientation had positive and significant correlation with attitude of respondents towards National Horticulture Mission.

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CONSTRAINTS FACED BY THE ATMA BENEFICIARY AND NON-BENEFICIARY FARMERS IN ADOPTION OF MUSTARD PRODUCTION TECHNOLOGY IN ALWAR DISTRICT OF RAJASTHAN

Amit Kumar*, L.S. Bareth, Hans Raj Sain*** and J.P. Lakhera******

ABSTRACT

A study was conducted in Alwar district of Rajasthan to study the constraints level of beneficiary and non-beneficiary farmers in adoption of regarding mustard production technology. Three panchayat samities namely Behror, Laxmangarh and Mundawar were selected for the investigation purpose where trainings were conducted under ATMA on mustard crop. The Department of Agriculture, Govt. of Rajasthan had imparted six days training on mustard production technology in six villages under ATMA Programme. All the respondents who had received training on mustard production technology were called beneficiary farmers, Further, village-wise list of mustard growers who have not received any training under mustard production technology were prepared with the help of Agriculture Supervisor, Deptt. of Agriculture who were termed as non-beneficiary farmers . Thus, 100 beneficiary and 100 non-beneficiary farmers were selected for the study purpose making a total of 200 respondents. The data were analyzed by using mean percent score. The finding of the study clearly indicated that marketing constraints (55.87 MPS) were the major constraints faced by mustard growers followed by ecological (53.50 MPS) and technological (36.51 MPS) constraints.

INTRODUCTION

Mustard is one of the important oil seed crops of the India. In India area (5.92 million hectare) and production (6.78 MT) of mustard with an average productivity of 1145 kg/ha during 2011-12. In Rajasthan, mustard is cultivated over an area of 25.30 lakh ha with the production of 27.00 lakh tonnes with the average yield is 1068 kg/ha. In Rajasthan state the mustard is mostly cultivated in Alwar, Bharatpur, Sawaimadhopur, Karoli, Dholpur, Jaipur, Sikar, Jhunjhunu and Sri Ganganagar districts.

RESEARCH METHODOLOGY

Alwar district of Rajasthan was purposely selected for the study. Three panchayat samities namely Behror, Laxmangarh and Mundawar were selected for the investigation where trainings were imparted under ATMA on mustard crop. From the mentioned three panchayat samities, where the Department of Agriculture, Govt. of Rajasthan had imparted six days training on mustard production technology in six villages under ATMA Programme, all the respondents who had received training on mustard production technology were included for the study purpose and were called beneficiary farmers. Further, village wise list from the same villages of mustard growers who had not received any training on mustard production technology was prepared. 100 beneficiary and 100 non-beneficiary farmers were selected for the study purpose with a total of 200 respondents. Personal interview method was applied for data collection.

RESULTS AND DISCUSSION

All the possible constraints being faced by the beneficiary and non-beneficiary farmers were grouped into three major categories viz., technological, ecological and marketing constraints. The results are presented under the following heads

Technological constraints : Table 1 reveals that the beneficiary as well as non-beneficiary and overall mustard growers perceived more constraints related to lack of knowledge & confidence in method of soil

*Ph.D Scholar, Department of Extension Education, College of Agriculture, SKRAU, Bikaner (Rajasthan).
**Professor, Department of Extension Education, College of Agriculture, SKRAU, Bikaner (Rajasthan).
***PG. Student, Department of Extension Education, College of Agriculture, SKRAU, Bikaner (Rajasthan).
****Professor & Head, Department of Extension Education, College of Agriculture, SKRAU, Bikaner (Rajasthan).

treatment, unavailability of labour at the harvesting time, high cost of plant protection chemicals and unavailability of fertilizers at peak season with rank 1st, 2nd, 3rd and 4th respectively.

In case of beneficiary and non-beneficiary mustard growers another important constraints faced by them were enough labour not available at the time of weeding, high cost of herbicides and timely unavailability of seed in/ around village with rank 6th, 7th and 8th, respectively. Further, in case of non-beneficiary mustard growers, they also faced the constraints regarding lack of knowledge about chemical weed management, unavailability of technical guidance, inadequate storage facility and lack of knowledge about seed treatment and assigned the rank 9th, 10th, 11th and 12th, respectively

Ecological constraints : From the Table 2 that major constraints perceived by beneficiary as well as non-beneficiary and over all mustard growers were losses due to frost, followed by very low temperature during night and High humidity affects the yield (in the month of February) with rank 1st, 2nd and 3rd, respectively. The another important constraints were high incidence of diseases due to unfavorable environment and untimely rains/hails at the time of maturity/harvesting and assigned the rank 4th& 5th by beneficiary farmers, and 5th & 4th rank by non-beneficiary farmers, respectively.

Marketing constraints : Table 3 shows that the beneficiary as well as non-beneficiary and over all mustard growers perceived more constraints related to lack of encouragement to establish oil extraction mill at cooperative level, low price just after harvest, proper marketing facilities are not provided by the Govt., lack of regulated market, low price of higher quality product, lack of knowledge about market rate/ supporting price, unawareness about procurement and lack of storage facility with rank 1st, 2nd, 3rd, 4th, 5th, 6th, 7th and 8th, respectively. Similarly they perceived least constraints in adoption of mustard production technology regarding bounded by local businessmen due to advance debt, difficulty to sell

Table 1: Technological Constraints perceived by the farmers in adoption of mustard production technology

S. No.	Technological Constraints	Beneficiary Farmers (n=100)		Non-Beneficiary Farmers (n=100)		Pooled (n=200)	
		MPS	Rank	MPS	Rank	MPS	Rank
I	**Field Preparation**						
1	Lackofknowledge about field preparation	6.00	34	9.00	34	7.50	34
2	High cost of field preparation implements	10.00	33	12.00	33	11.00	33
II	**Soil treatment**						
1	Lackof knowledge andconfidenceinmethodof soil treatment	74.00	1	79.00	1	76.50	1
2	Soil treatment chemicalscostly	35.00	13	38.00	18	36.50	15
3	Not convinced about profit	12.00	30	19.00	32	15.50	32
III	**Use of high yielding varieties**						
1	Timely unavailability of seed in/ around village	49.00	8	54.00	8	51.50	9
2	Seed do not available in required quantity	30.00	18	32.00	22	31.00	20
3	Require more organic manure & fertilizer	17.00	28	22.00	30	19.50	30

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IV	**Seed Treatment**						
1	Lack of knowledge about seed treatment	38.00	12	49.00	12	43.50	10
2	Unavailabilityof suitable equipment forseedtreatment	23.00	23	22.00	28	22.50	27
3	Unavailabilityofchemicalsfor seed treatment in time	40.00	11	42.00	16	41.00	14
V	**Sowing Time, Seed Rate & Spacing**						
1	Lackofknowledgeaboutrecommended seedrate	12.00	31	21.00	31	16.50	31
2	Delaysowingreduces theyield	14.00	29	25.00	27	19.50	29
3	Moreinsectpestincidence in delay sowing	19.00	26	22.00	29	20.50	28
4	Lackofseed cum-fertilizer drillforsowing	23.00	21	31.00	25	27.00	23
VI	**Fertilizer Application**						
1	Lack of knowledge about recommended dose of fertilizer	28.00	19	44.00	14	36.00	16
2	Unavailability of FYM	11.00	32	39.00	17	25.00	25
3	unavailabilityoffertilizers at peak season	55.00	5	58.00	5	56.50	4
4	Reduction of soil fertility with use of chemical fertilizers	19.00	27	38.00	19	28.50	22
VII	**Weed management**						
1	Lackofknowledge about chemical weed management	31.00	16	54.00	9	42.50	12
2	Enoughlabour notavailable at the time of weeding.	54.00	6	57.00	6	55.50	6
3	Manualweedingisbetter	21.00	25	46.00	13	33.50	17
4	Highcost of herbicides	52.00	7	55.00	7	53.50	8
5	Hazardoustoenvironment and health	23.00	22	27.00	26	25.00	26
6	Unavailabilityofherbicides at local market	42.00	10	44.00	15	43.00	11
VIII	**Plant Protection Measures**						
1	Lackofknowledge about PlantProtectionMeasures	47.00	9	65.00	3	56.00	5
2	Harmfulresidualeffect	22.00	24	32.00	23	27.00	24
3	Harmful to human beings at the time of operation	27.00	20	31.00	24	29.00	21
4	Unavailability of sprayer/dusters in local area	31.00	15	35.00	21	33.00	18
5	Highcost of plant protection chemicals	60.00	3	62.00	4	61.00	3
6	Unavailability of recommended plant protection chemicals at local market	30.00	17	36.00	20	33.00	19
IX	**Harvesting, Threshing & Storage**						
1	Unavailabilityoftechnicalguidance	34.00	14	51.00	10	42.50	13
2	Unavailabilityof labour at the harvesting time	68.00	2	67.00	2	67.50	2
3	Inadequatestoragefacility	58.00	4	50.00	11	54.00	7

Table 2 : Ecological constraints as perceived by the respondents in adoption of mustard production technology

S. No.	Constraints	Beneficiary Farmers (n=100)		Non-Beneficiary Farmers (n=100)		Pooled (n=200)	
		MPS	Rank	MPS	Rank	MPS	Rank
1	Very low temperature during night	75.00	II	77.00	II	76.00	II
2	Losses due to frost	93.00	I	94.00	I	93.50	I
3	Untimely rains/hails at the time of maturity/harvesting	39.00	V	46.00	IV	42.50	IV
4	High incidence of diseases due to unfavorable environment	43.00	IV	38.00	V	40.50	V
5	High humidity affects the yield (in month-February)	69.00	III	68.00	III	68.50	III

Table 3 : Marketing constraints as perceived by the respondents in adoption of mustard production technology

S. No.	Constraints	Beneficiary Farmers (n=100)		Non-Beneficiary Farmers (n=100)		Pooled (n=200)	
		MPS	Rank	MPS	Rank	MPS	Rank
1	Lack of storage facilities	49.00	VIII	52.00	VIII	50.50	VIII
2	Lack of transportation facilities	34.00	IX	40.00	IX	37.00	IX
3	Lack of knowledge about market rate/supporting price	58.00	VI	69.00	IV	63.50	VI
4	Proper marketing facilities are not provided by the Govt.	83.00	III	84.00	III	83.50	III
5	Incorrect weight & measurement by middleman/ businessmen	29.00	XI	34.00	X	31.50	X
6	Low price of higher quality product	63.00	V	68.00	V	65.50	V
7	Bounded by local businessmen due to advance debt	23.00	XII	20.00	XII	21.50	XII
8	Difficulty to sell produce in interior areas at appropriate rate	30.00	X	26.00	XI	28.00	XI
9	Unawareness about procurement	51.00	VII	54.00	VII	52.50	VII
10	Low price just after harvest	85.00	II	86.00	I	85.50	II
11	Lack of regulated market	66.00	IV	67.00	VI	66.50	IV
12	Lack of encouragement to establish oil extraction mill at cooperative level	88.00	I	82.00	II	85.00	I

produce in interior areas at appropriate rate and incorrect weight & measurement by middleman/ businessman and accordingly the rank were assigned as 12th, 11th and 10th, respectively.

Overall constraints perceived by the respondents in adoption of improved mustard cultivation practices: The data presented in Table 4 reveal that the beneficiary and non-beneficiary mustard growers perceived more constraints related to marketing, ecological and technological constraints with rank 1st, 2nd and 3rd, respectively.

Table 4 : Overall constraints perceived by the respondents in adoption of improved mustard cultivation practices

S. No.	Constraints related to	Beneficiary Farmers (n=100)		Non-Beneficiary Farmers (n=100)		Pooled (n=200)	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Technological Constraints	32.79	III	40.23	III	36.51	III
2.	Ecological Constraints	53.17	II	53.83	II	53.50	II
3.	Marketing Constraints	54.92	I	56.83	I	55.87	I

CONCLUSION

Beneficiary as well as non-beneficiary and over all mustard growers perceived more constraints such as lack of knowledge & confidence in method of soil treatment, unavailability of labour at the harvesting time, high cost of plant protection chemicals and unavailability of fertilizers at peak season in technological constraints category. In the category of ecological constraints, they perceived losses due to frost, followed by very low temperature during night and high humidity affects the yield (in the month of February). Further they perceived more constraints i.e. lack of encouragement to establish oil extraction mill at cooperative level, low price just after harvest, proper marketing facilities are not provided by the Govt. and lack of regulated market in marketing constraints category.

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DOCUMENTATION AND STANDARDIZATION OF INDIGENOUS PRACTICES REGARDING CHILD CARE IN BIKANER DISTRICT OF RAJASTHAN

Prasanlata Arya* and Rajandra Rathor**

ABSTRACT

The present study was conducted in Bikaner district of Rajasthan. There are six panchayat samities, out of these two panchayat samities were selected randomly for study area i.e. Bikaner and Nokha. For rural locale two villages were selected randomly from each panchayat samiti. For urban local Bikaner city was selected. It was divided two zones like East and west. From each zone two wards were selected. For the sample selection older women above 50 years of age was selected for the study. From each village and ward, 30 women were selected randomly. Thus, total 240 respondents constituted the sample size from rural and urban area. The data were collected through interview schedule. The study revealed that all the respondents in urban as well as the rural area were followed indigenous practices for care of baby was first bath given to infant just after birth, take temperature of bath water according to season, used old cloth diaper and keep iron knife near to bed of the baby. Maximum practices were considered logically correct by ayuravedi doctors.

INTRODUCTION

Indigenous knowledge is developed and adopted continuously to gradually changing environments and passed down from generation to generation and closely interwoven with peoples cultural values. Indigenous knowledge is also the social capital of the poor, their main asset to invest in the struggle for survival, to produce food, to provide for shelter or to achieve control of their own lives. Women possess an enormous amount of knowledge about food production and processing, child rearing, clot*hing* for family, managerial work for various family aspects, agriculture, natural resource management, human and animal care and various household works over the centuries. At present, insufficient pre, peri and postnatal care is the main cause of maternal and child health problems in the world especially in developing countries. Of all deaths which occur in the first five years of life, 36 per cent are neonatal deaths. The various household works over the centuries. At present, insufficient pre, peri and postnatal care is the main cause of maternal and child health problems in the world especially in developing countries. Of all deaths which occur in the first five years of life, 36 per cent are neonatal deaths. The neonatal mortality may depend significantly on interventions involving promotion or adoption of traditional care and behaviours practiced at home. Culture values, attitudes, beliefs and behaviours affect life style and health of mother and babies, some of these practices have no negative effects on their babies. However, some traditional practices have harmful effect on babies and mother health. Documentation of such practices not only helps in probing the past but also help in bringing to light even fragmentary information on traditional method of our ancestor. Besides this, it would help to preserve for posterity the age old practices remain unrecorded and undocumented. Thus, in this study investigator documented child care practices, that is generally done by the Indian women. Hence, present study was undertaken with following specific objectives:

1. To document the existing indigenous knowledge regarding child care practices in study area.

RESEARCH METHODOLOGY

The study was conducted in Bikaner district of Rajasthan which was selected purposely. There are six panchayat samities out of these two panchayat samities were selected randomly for study area i.e. Bikaner and Nokha. For rural locale two villages were selected randomly from each panchayat samiti. From Bikaner panchayat samiti Gadwala and Jamsar village and from Nokha panchayat samiti Bhamatsar and

*Assistant Professor, Deptt. of Ext. Education and Communication Management, SKRAU, CHSc. Bikaner.
**Professor, Deptt. of Extension Education, SKN Agriculture University, Jobner (Jaipur).

Nokha village were selected. For urban local Bikaner city was selected. It was divided into two zones like East and west. From each zone two wards were selected i.e. 24 and 45 ward from east zone and wards 16 and 60 from west zone. For the sample selection older women above 50 years of age was selected for the study. From each village and ward, 30 women were selected randomly. Thus, total 240 respondents constituted the sample size from rural and urban area. The data were collected through interview schedule.

RESULTS AND DISCUSSION

Documentation of the indigenous knowledge regarding child care practices: In present study only those indigenous practices have been reported which were followed by the respondents for the care of child. There are nine aspects included and the related information about these aspects has been presented in Table 1.

(i) First food given to infant : On overall basis, majority of the respondents (45%) introduced first feed to new born baby in the form of jaggery followed by *ajwain* & jaggery (20.83%), *ajwain*, jaggery and desi *ghee* (6.25%), mother milk (12.50%), milk of goat (11.25%) and traditional mixture of ber (plant) keel, *chandelia* (a desert plant), jaggery, panbrahmi goli,1-2 tulsi leaves (4.16%). The table further shows that 75 per cent of urban respondents have given first feed to new born baby in form of jaggery and 25 per cent respondents have given mother milk to new born baby. In rural areas, 41.66 per cent respondents have given first feed to new born baby *ajwain* and jaggery followed by jaggery (15%), *ajwain* jaggery and desi *ghee* (12.5%), traditional mixture of ber plant, Keel, Chandelia (a desert plant), Jaggery, Pan Brahmi Goli, 1-2 leaves of *Tulsi* (8.3%) and milk of goat (22.50%). In rural areas goat milk were given as first feed to new born baby because they believe that the secretion of mother milk was not start first 2-3 days after delivery so they feed their baby goat milk till start milk secretion of mother.

Cent per cent respondents believed that jaggery, *ajwain*, jaggery and traditional mixture help to clean the digestive tract of child and develop proper digestion. Goat milk is very light and easily digestible and is very much similar to mother milk.

The findings of the study were supported with the findings of Winch *et al*. (2005) and Kaur and Singh (2012) they reported that babies were first fed with sugar, water, honey and ready made gutty by the people.

(ii) Time of starting breast feeding : Table 1 exhibts that majority of the respondents (83.33%) start breast feeding at the time of twinkling stars followed by (16.67%) start breast feeding after one hour of birth. Majority of respondents (75%) in urban areas and (91.67%) in rural areas start breast feeding at the time of twinkling stars, while, 25.0 per cent respondents in urban areas and 8.33 per cent in rural areas start breast feeding one hour after birth. Most of the respondents beleived that these are traditionally practices and should be followed.

The findings are in concernences with findings of Ozyazicioglu and Polat (2004) noted that 84 per cent of the mother breast feed their babies soon after delivery, but that the rest did not breastfeed their babies until they heard three to five Azaans.

(iii) First mother milk (colostrum) given to infant : On overall basis, 77.08 per cent of respondents gave first mother milk to their baby and rest do not follow the practice. Majority of urban (62.50%) and rural (91.67%) respondents gave first mother milk to their baby because they believed that it is stronger substance and make child strong and healthy. Rest of the respondents do not give the first mother milk to their baby because they believed that it is bad and dirty milk as it was stored in mother from 9th months and is very harmful for the child health and they discard it without giving to child. Similar findings have also been reported by Reissland and Brughart (1998), Mattson (2000) and Roy *et al*. (2010) they reported that women thought colostrums to be bad or dirty and therefore did not give it to their babies.

(iv) First bath given to infant : Almost all respondents of urban and rural areas were giving first bath to infant just after birth because they believed that after bath the baby clean out, feel comfort and sleep for longer duration.The findings of the study are supported by the findings of Pradhan

Table 1: Distribution of respondents by indigenous practices regarding care of child

S. No.	Indigenous practices	Urban respondent (n=120)	Rural respondent (n=120)	Total respondent (N=240)
		F (%)	F (%)	F (%)
1.	First food given to infant			
	(a) Jaggery	90 (75.00)	18 (15.00)	108 (45.00)
	(b) Ajwain and Jaggary	-	50 (41.66)	50 (20.83)
	(c) Ajwain, Jaggary and desi *ghee*		15(12.5)	15 (6.25)
	(d) Milk of goat		27 (22.50)	27 (11.25)
	(e) Traditionl mixture of Ber (plant) keel, *chandelia* (a desert plant), jaggary, Pan Brahmigoli, 1-2 leaves of tulsi		10 (8.3)	10 (4.16)
	(f) Mother milk	30 (25.00)	-	30 (12.50)
2.	Time of starting breast feeding to infant after birth			
	(a) One hour after birth	30 (25.00)	10 (8.33)	40 (16.67)
	(b) In twinkling of stars	90 (75.00)	110 (91.67)	200 (83.33)
3.	First mother milk (colostrum) given to infant			
	(a) Yes	75 (62.50)	110 (91.67)	185 (77.08)
	(b) No	45 (37.50)	10 (8.33)	55 (22.92)
4.	First bath given to infant			
	(a) Just after birth	120(100.0)	120 (100.0)	240 (100.0)
5.	Practices followed during bath of baby			
	(a) Water temperature according to season	120(100.0)	120 (100.0)	240 (100.0)
	(b) Oil massage	95 (79.17)	75 (62.50)	170 (70.83)
	(c) Gold, silver, barley, *ghee*, *ajwain*, coconut, milk and curd are added in bath water	55 (45.83)	25 (20.83)	80 (33.33)
	(d) A mixture made up	85 (70.83)	75 (62.50)	160 (66.67)
6.	Type of cloth used for the baby			
	(a) Old clothes of elderly person	93 (77.50)	120 (100.0)	213 (88.75)
	(b) Soft cotton clothes	27 (22.50)	-	27 (11.25)
7.	Type of napkins used for the baby			
	(a) Cloth diaper (old)	120(100.0)	120(100. 0)	240(100.00)
8.	Any other practices followed for care of baby			
	(a) Keep water near bed of baby	75 (62.50)	90 (75.00)	165 (68.75)
	(b) Keep iron knife	120(100.0)	120 (100.0)	240(100.00)
	(c) Keep holy book	25 (20.83)	-	25 (10.42)
	(d) Wheat or bajra put on near the four pillar of cot	23 (19.17)	75 (62.50)	98 (40.83)
	(e) Kept a pot cow urine at the main gate of house and entered person first sprinkle urine and then entered	25 (20.83)	-	25 (10.42)

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	(f) Tied *neem* leaves on baby's room	25 (20.83)	-	25 (10.42)
	(g) Making Rai pillow for child	15 (12.50)	-	15 (6.25)
	(h) Home prepared kajal is used in baby eyes	65 (54.17)	90 (75.00)	155 (64.58)
	(i) A pen and copy is put near to baby after six days of birth (a cermoney will celebrate)	78 (65.00)	-	78 (32.50)
	(j) Rai and salt tie in red cloth and put near to baby	90 (75.00)	95 (79.17)	185 (77.08)
9.	Indigenous treatment given in general diseases to the baby			
	(i) Stomach pain			
	(a) Gutty : Mixture of *Jaiphal*, *harad* and *saindha namak*	75 (62.50)	35 (29.17)	110 (45.83)
	(b) Boiled water of Ajwain and Jaggery	80 (66.67)	95 (79.17)	175 (72.92)
	(c) Boiled *hing* water message on naval of infant	65 (54.17)	-	65 (27.08)
	(ii) Cold			
	(a) Heated garlic with mustard oil massage on hands, feet and chest	65 (54.17)	-	65 (27.08)
	(b) Mix *kapoor* and mustard oil and massage on chest and nose of baby	35 (29.17)	-	35 (14.58)
	(iii) Constipation			
	(a) Gutty : mixture of Harad, *Jaiphal* and black salt	110(91.67)	100 (83.33)	210 (87.50)
	(b) Soap kibatti	65 (54.17)	-	65 (27.08)
	(iv) Diarrhea			
	(a) Lemon juice with raw milk	75 (62.50)	-	75 (31.25)
	(b) Boiled kachha mango seed with water and given to baby	35 (29.17)	-	35 (14.58)
	(c) *Jaiphal* mixed with cold water given to baby	110(91.67)	100 (83.33)	210 (87.50)
	(v) Fever			
	(a) Mixture of heated *fitkari* and *Suhaga*	65 (54.17)	-	65 (27.08)
	(b) *Jaiphal* with Luke warm water	105(87.50)	110 (91.67)	215 (89.58)
	(c) *Mulethi* mix with honey	55 (45.83)		55 (22.92)
	(vi) Rashes			
	(a) Malai	80 (66.67)	-	80 (33.33)
	(b) Butter	80 (66.67)	-	80 (33.33)

(2002) and Negi *et al*. (2015). According to them many families followed a tradition of bat*hing* of new born baby just after birth such as 20-30 minutes after birth.

(v) Practices followed during bath of baby : Almost all of the respondents of urban and rural areas were using water temperature according to season during bath of babies, while, 79.17 per cent of urban and 62.50 per cent rural respondents doing oil massage during bath of baby. About 45.83 per cent in urban area and 20.83 per cent in rural areas of respondents added gold, silver, barley, *ghee*, *ajwain*, coconut, milk and curd in bat*hing* water, while 70.83 per cent in urban and 62.50 per cent in rural areas used a mixture made up of wheat or barley flour, oil or desi *ghee* which they rub on baby forehead, hand, legs and whole body.

On overall basis, cent per cent of respondents

using water temperature according to season during bath of babies followed by oil messages (70.83%), a mixture made up of wheat or barley, flour, oil or desi *ghee* rub on baby forehead, hand, legs and whole body (66.67%) and gold, silver, barley, *ghee*, *ajwain*, coconut, milk and curd are added in bath water (33.33%).

The reason given by the respondents behind these practices are that the water temperature according to season protect from cold and disease, massage with mustard oil make the baby born strong and baby sleep well and addition of gold, silver etc. in water is good for baby and rubbing with mixture (wheat or barley) flour, oil or desi *ghee* make baby skin soft and clean remove unnecessary hairs on baby is body.

The findings are in concurrence with findings of Yalin (1998), Ozden (1998) and Platin and Khorshid (1994) they reported that gold, silver, hellebore, forty g*rai*ns of rice *etc*. added by women in water of baby bath. So that their babies or their mouth do not smell bad in their later lives.

(vi) Types of clothes used for baby : Almost all respondents of rural area and 77.50 per cent respondents of irrespective area used old cloth of elderly person and 22.50 per cent urban respondents used soft cotton cloths for new born baby. On overall basis, 88.75 per cent respondents used old cloth of elderly person and 11.25 per cent respondents used soft cotton cloths for new born baby. The reason given by them was that new born child will have longer life similar to their grand parents.

Similar findings have been also reported by Chandwadhkar (1968) and Kaur and Singh (2012) they reported that old clothes or old clothes of elderly person were used for clot*hing* the new born child for the first time for long life of new born.

(vii) Types of napkin used for baby : All the respondents used old cloth diaper for baby in urban and rural areas.

(viii) Any other practices followed for care of body: In case of urban areas, hundred per cent respondents keep iron knife near to baby followed by *rai* and salt tied in red cloth and put near to baby (75%), a pen and copy is kept near to baby after six days of birth (65%), keep water near bed of baby (62.50%), home prepared kajal is used in baby eyes (54.17%), tied *neem* leaves on baby's room and kept a pot cow urine at the main gate of house and entered person touch urine and then entered (20.83%), keep holy book (20.83%), Wheat or bajra kept on near the four pillar of cot (19.17%) and making Rai pillow for child (12.50%).

In rural areas, all respondents keep iron knife near to baby followed by *rai* and salt tied in red cloth and put near to baby (79.17%), home prepared kajal is used in baby eyes (75.00%), keep water near bed of baby (75%) and wheat or bajra put on near the four pillar of cot (62.50%).

On overall basis, all respondents keep iron knife near to baby followed by *rai* and salt tied in red cloth and put near baby (77.08%), near bed of baby water was also kept (68.75%), home prepared kajal is used in baby eyes (64.58%), wheat or bajra spead near the four pillar of cot (40.83%), a pen and copy kept near baby after six days of birth (32.50%), a holy book is also (10.42%), cow urine pot is also kept at the main gate so that person entering the house should first sprinkle the urine and then enter (10.42%), *neem* leaves are tied and hanged on baby's room (10.42%) and making *Rai* pillow for child (6.25%).

The informal discussion with respondents about why they are following these practices they responded that all these practices protect mother and child from bad spirits, *neem* leaves protect from mosquito and fly, *rai* pillow make baby neck st*rai*ght and head become round and kajal is good for baby eyes, copy and pen kept near to the baby in the impression that goddess will come and write future of the baby.

Similar findings have also been reported by Choudhary (1997), Zoysa *et al*. (1998) and Kaur and Singh (2012) that black dot of Kajal was placed on the new born, keeping iron and water under the cot of mother and baby as protected from bad spirits.

(ix) Indigenous treatment given in general diseases to the baby

Stomach pain : In case of urban areas, 66.67 per cent of respondents gave *ajwain* and jaggary

boiled in water to their baby when they suffer with stomach pain followed by gutty of *Jaiphal*, *harad* and *saindha namak* (black salt) (62.50%) and massage is done naval of infant with the use of *hing* boiled in water (54.17%). Similarly, in rural areas, majority of respondents (79.17%) gave *ajwain* and jaggery boiled water to their baby when they suffer stomach pain followed by gutty of *Jaiphal*, *harad* and *saindha namak* (black salt) (29.17%).

On overall basis, majority of respondents (72.92%) gave *ajwain* and jaggary boiled in water to their baby when they suffer from stomach pain followed by gutty of *Jaiphal*, *harad* and *saindha namak* (45.83%) and massage is done naval of infant with the use *hing* boiled in water (27.08%).

Reasons given by the respondents behind following above practices was that gutty cure's stomach pain fast their elders advised them these treatment ie. *hing*, *ajwain*, jaggery, *jaiphal*, *harad*, *sandha namak* are helpful in digestion.

Cold : To cure cold mainly two practices followed by the respondents. About 54.17 per cent urban respondents were doing massage of heated garlic with mustard oil massage on hands, feet and chest and 29.17 per cent respondents were doing massage with mixture of *kapoor* and mustard oil on chest and nose of baby, contrast above two practices were not followed in rural areas. The reason given by them was hot mustard oil cure's cold fast and advised by their older people.

Constipation : Two practices are mainly followed by the respondents to cure constipation of baby. About 91.67 per cent respondents in urban areas and 83.33 per cent respondents of rural areas were giving gutty which was mixture of Harad, *Jaiphal* and black salt to the infant to cure constipation. In urban area, 54.17 per cent respondents were putting soap kibatti in the anus of infant to cure constipation but this practice is not followed by rural area. The reason given by respondents was all these products have good digestive quality. On overall basis majority of respondents (87.50%) were give gutty followed by soap kibatti (27.08%) to cure the problem of constipation.

Diarrhea : Three practices were followed by the respondents to cure diarrhea of infant. Majority of respondents (91.67%) gave *jaiphal* mixed with cold water to baby followed by lemon juice with raw milk (62.50%) and boiled kachha mango seed with water to baby (29.17%) in urban areas, while, in rural area, majority of respondents (83.33%) gave *jaiphal* mixed with cold water to their baby.

On overall basis, 87.50 per cent respondents were giving *jaiphal* mixed with cold water to baby followed by lemon juice with raw milk (31.25%) and boiled kachha mango seed with water to baby (14.58%). The reason given by the respondents these practices were advised by their elders.

Fever : Three practices are mostly followed by the respondents to cure fever of baby. Regarding the fever, 91.67 per cent respondents of rural area gave the *jaiphal* with luke warm water to cure fever of baby, while, in urban area, 87.50 per cent respondents give the *jaiphal* with luke warm water. The other two practices, mixture of heated *fitkari* and *Suhaga* and *Mulethi* mix with honey were given by 54.17 and 45.83 per cent of respondents of urban area, while, these practices were not followed in rural areas.

On overall basis, 89.58 per cent respondents gave the *jaiphal* with luke warm water to cure fever of baby followed by mixture of heated *fitkari* and *Suhaga* (27.08%) and *Mulethi* mix with honey (22.92%). The reason given by the respondents behind these practices are that all t*hing*s that are given in fever are considered hot in nature and cure cold fast and also advised by elder female.

Rashes : On overall basis 33.33 per cent respondents were followed both practices. Majority of respondents (66.67) of urban area use *malai* and cream on the rashes and in rural area none of the respondents use these practices. The reason given by the lrespondents that *malai* and butter make skin soft and cure rashes.

The findings supported with findings of Negi *et al*. (2015), they reported that various indigenous practices related to child health such as stomach pain, vomiting, fever, cold and cough, diarrhea etc. were followed by the rural women.

CONCLUSION

The indigenous practices regarding to care of child followed by majority of the respondents such as first food given to new born baby was (Jaggery, jaggery and *ajwain*, *ajwain*, jaggery and desi *ghee* and goat milk), given first mother milk (colostrums) to their baby, in bath practices (temperature of bath water according to season, massage of baby with mustard oil), tied *neem* leaves at gate, used *rai* pillow, indigenous treatment given in general diseases i.e. stomach pain, cold constipation, diarrhea, fever and rashes etc. All these practices considered logically correct by the experts field of Auyraveda.

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INTERRELATIONSHIP OF VARIOUS PRICE CONCEPTS FOR IMPORTANT FOODGRAINS OF RAJASTHAN

Latika Sharma* and Nitu Mehta (Ranka)**

ABSTRACT

The main objective of governments price policy for agriculture produce aims at ensuring remunerative prices to the growers for their produce with a view to encourage higher investment and production. To be remunerative to the farmers, it is very important that these Minimum Support Prices announced by the government must cover the cost of production of crops being incurred by the farmers. Similarly the Farm Harvest Prices received by the farmers also must be remunerative enough to cover the cost of production of crops and to make the farming an economic enterprise. To be remunerative to the farmers, it is very important that these Minimum Support Prices announced by the government must cover the cost of production of crops being incurred by the farmers. Similarly the Farm Harvest Prices received by the farmers also must be remunerative enough to cover the cost of production of crops and to make the farming an economic enterprise. The pattern of farm harvest prices, minimum support prices and cost of production for four important food grain crops of Rajasthan from 1992 to 2009 were studied and the interrelationship of these prices and cost were analyzed. Farm harvest prices which the farmer gets at his farm or village site during harvest period were affected significantly by the minimum support prices (MSP) announced by the government and set a higher level. This relation was observed highly proportional for wheat and gram and less proportional for maize and bajra in Rajasthan. The MSP of wheat and to some extent bajra effectively reflected the changes in the cost of production of these crops whereas in maize and gram MSP reflected less proportional change than changes in their cost of production.

INTRODUCTION

The strategic approach for agricultural development in the regime of economic planning in the country included evolution and dissemination of appropriate technologies on one side and support through institutional frame work and policy interventions on the other side. Technological changes and price incentives are important instruments for accelerating growth in agriculture sector. Once proper technology is available then positive price policy plays a significant role in stimulating production through allocation of desired level of resources between the agriculture sector and non agriculture sector and also within the agriculture sector. Agricultural price policy is of importance with respect to income distribution also. It affects capital formation in the industrial sector by its influence on distribution of income, wage rates, industrial profit and net government revenue. But the main objective of governments price policy for agriculture produce aims at ensuring remunerative prices to the growers for their produce with a view to encourage higher investment and production. Minimum support prices (MSP) for major agricultural crops are announced each year which are fixed after taking into account the recommendations of Commissions for Agricultural Costs and Prices (CACP).

To be remunerative to the farmers, it is very important that these Minimum Support Prices announced by the government must cover the cost of production of crops being incurred by the farmers. Similarly the Farm Harvest Prices received by the farmers also must be remunerative enough to cover the cost of production of crops and to make the farming an economic enterprise. This study is an attempt to study the trend in Farm Harvest Prices, Minimum Support Prices and Cost of Production of some selected cereal crops of Rajasthan and to examine the inter-relationship of different prices and cost (support prices, farm harvest prices and cost of production).

RESEARCH METHODOLOGY

The concept of the type of prices and cost chosen

*Department of Agricultural Economics & Management, Rajasthan College of Agriculture, MPUAT, Udaipur-313001
**Department of Agricultural Economics & Management, Rajasthan College of Agriculture, MPUAT, Udaipur-313001

for the analysis are summarized below-

1. **Farm Harvest Price:** These represent the average wholesale prices at which the commodity is disposed off by the producers at village site during the prescribed post harvest period of 6 to 8 weeks. Farm harvest prices are collected from each selected market in state and then the state average for the whole season is worked out.
2. **Minimum Support Price:** This is the price fixed by the government to protect the producer-farmers against excessive fall in price during bumper production years. These prices give a sort of price guarantee to the farmers.
3. **Cost of Production (Cost C_2):** Cost C_2 includes the paid out and imputed cost per unit of production.

Interrelationship of price and Cost: Let FHP, MSP and COP denote farm harvest price, minimum support price and cost of production respectively of a commodity. It is intended to explore whether prices are a function of cost of production and whether farm harvest prices are a function of minimum support prices. A state level average of farm harvest price and cost of production has been considered for this study.

FHP = f (COP)

MSP = f (COP)

FHP = f (MSP)

Four major cereal crops of Rajasthan were purposively selected for the study. These are Wheat and Gram from Rabi season and Maize and Bajra from Kharif season. The study is based on the secondary data from 1992 to 2009 published by DES, Ministry of Agriculture, Government of India.

RESULTS AND DISCUSSION

Figure 1 shows the scatter diagram of farm harvest price, minimum support price and cost of production of wheat from 1992 to 2008. In all the years' farm harvest price and minimum support price of wheat are higher than the cost of production of wheat in Rajasthan. This shows that wheat is a profitable crop for farmers of Rajasthan as they are able to get remunerative prices over and above their cost of production (Cost C2). The shape of curves of FHP and MSP show exponential growth whereas the shape of COP curve is showing linear positive growth. Farm harvest prices of wheat have always remained more than minimum support price announced by the government. Minimum support prices of wheat between 1999 to 2004 have grown at a slow rate but since 2005 they have gained momentum. Cost of production of wheat (Cost C2) has also shown a peak in 2006 and again in 2008. More or less the status of prices of wheat vis a vis cost of production has been ideal situation making it a remunerative crop for farmers of Rajasthan. Table 1 shows the interrelationship between farm harvest price and cost of production; minimum support price

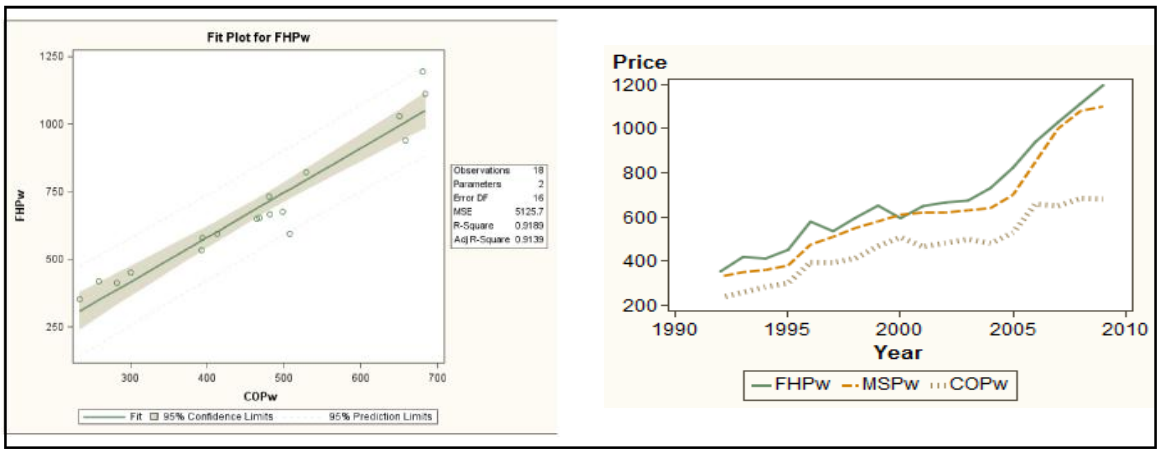

Fig. 1

and cost of production; and farm harvest price and minimum support price of wheat in Rajasthan assuming linear relationship.

Table 1 shows that the farm harvest price of wheat are associated positively with the cost of production. Similarly minimum support price of wheat also show a positive significant association with the cost of production .The slope of both the price lines are more than unity and the coefficient of determination is above 90 percent. This signifies that more than ninety percent of the variation in farm harvest price and minimum support price can be explained by variation in cost of production of wheat. It shows that the minimum support prices announced by the government helps to set the farm harvest prices at a higher level every year. With coefficient value being 1.01 the association between these two is almost proportional.

Bajra : Figure 2 shows the line plot of farm harvest price, minimum support price and cost of production (Cost C_2) of bajra in Rajasthan. The farm harvest prices and the cost of production of bajra are showing wide fluctuation whereas minimum support prices of bajra are more or less growing at a stable rate. The rise and fall of farm harvest price and cost of production of bajra is in synchronization. In most of the years the cost of production of bajra is higher than the minimum support prices announced by the government. After 2007 the minimum support price shows considerable increase due to government policies thus making bajra a profitable crop for the farmers of Rajasthan.

Table 2 shows the interrelationship between different prices and cost of production of bajra in Rajasthan. Equation 1 shows significant relationship at 1% level of significance between farm harvest prices and cost of production of bajra. The farm harvest prices are proved to have a high association to cost of production of bajra. Here the cost of production includes the imputed values of family labour, interest on owned assets and owned land. The high R^2 value (81.36 per cent) and the b value (1.056) realized confirms that the farm harvest prices of bajra are determined by its cost of production. Table 2 shows the association of minimum support price of bajra with cost of production of bajra. The

Table 1: Inter-relationship of prices and cost in Wheat

S.No.	No. of Obs.	Linear regression equation	R-Square	S. Error	F-Value	Pr>F
1	18	FHPw= -77.08+1.65COPw	0.9189	0.1223	181.36	<.0001
2	18	MSPw= -122.07+1.62COPw	0.9328	0.1087	222.21	<.0001
3	18	FHPw= 48.79+1.013MSPw	0.9794	0.0367	762.03	<.0001

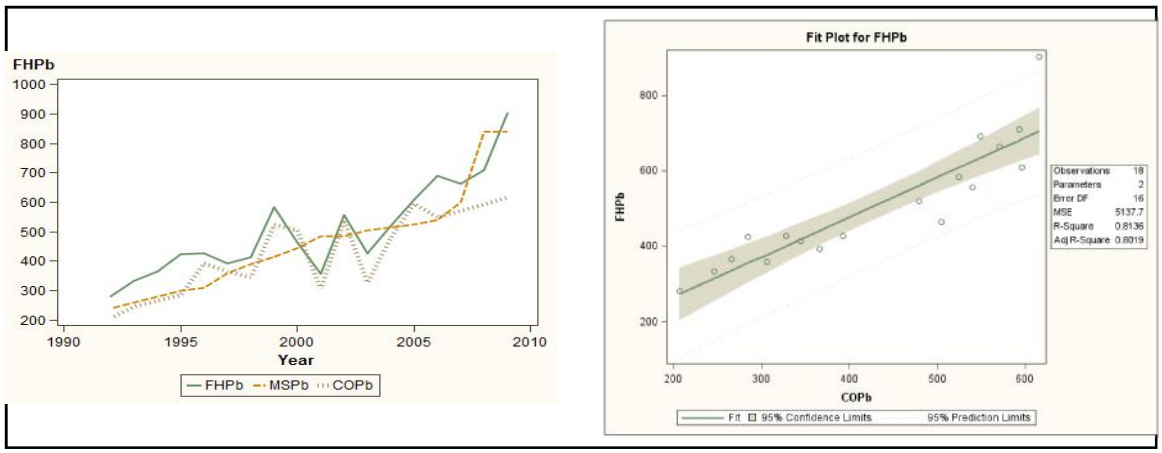

Fig. 2

association is significant at 1% level of significance but the parameter estimate is slightly less than 1(0.999). This signifies that the association between minimum support price of bajra is almost proportional to cost of production of bajra and about 63 percent variation in minimum support price of bajra can be explained by variation in its cost of production. Thus although the relation is significant, R^2 value is not very high Table 2 shows the relationship between farm harvest prices of bajra and minimum support price of bajra. A significant relationship between these two signifies that the minimum support price which are announced by the government before the sowing period, facilitates to determine the farm harvest price at a higher level although the changes in farm harvest price are less proportionate to changes in minimum support price (b= 0.81). Thus in case of bajra crop in Rajasthan the relationship between prices and cost is significant but less than proportional.

Maize : Maize is a staple food crop of Southern Rajasthan. Figure 3 signifies that maize is an unprofitable crop in Rajasthan as its cost of production (Cost C_2) is throughout higher than the farm harvest price realised by the farmer from the trader on the farm or at village site during the harvest period as well as the minimum support price of maize which announced by the government annually. Although the farm harvest price and minimum support price both have shown a rise after 2006 but still the minimum support price is less than cost of production making it a non remunerative crop for farmers of Rajasthan.

Table 3 shows the relationship between farm harvest price and cost of production of maize; minimum support price and cost of production of maize; and farm harvest price and minimum support price of maize in Rajasthan. The price-cost and price-price relationship show positive correlation in case of maize. The cost of production pushed up the farm harvest price and minimum support price of maize. However the farm harvest price and minimum support price increased at a less than proportionate rate with cost of production as evidenced by the slope of the linear relationship of these two prices with cost of production of maize. Table 3 shows a higher correlation between farm harvest prices and minimum

Table 2: Inter-relationship of prices and cost in Bajra

S.No.	No. of Obs.	Linear regression equation	R-Square	S. Error	F-Value	Pr>F
1	18	FHPb= 54.093+1.06COPb	0.8136	0.1264	69.82	<.0001
2	18	MSPb= 34.497+0.99COPb	0.6291	0.1919	27.14	<.0001
3	18	FHPb= 30.57+0.812MSPb	0.765	0.1125	52.10	<.0001

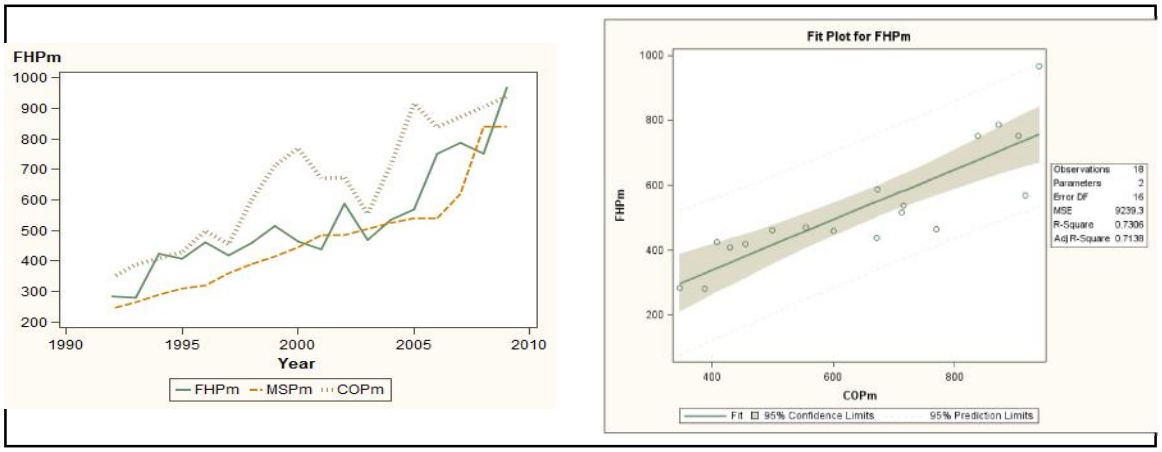

Fig. 3

Table 3: Inter-relationship of prices and cost in Maize

S.No.	No. of Obs.	Linear regression equation	R-Square	S. Error	F-Value	Pr>F
1	18	FHPm= 28.055+0.77COPm	0.7306	0.1177	43.39	<.0001
2	18	MSPm= -28.49+0.76COPm	0.7693	0.1046	53.35	<.0001
3	18	FHPm= 93.13+0.93MSPm	0.8106	0.1133	68.47	<.0001

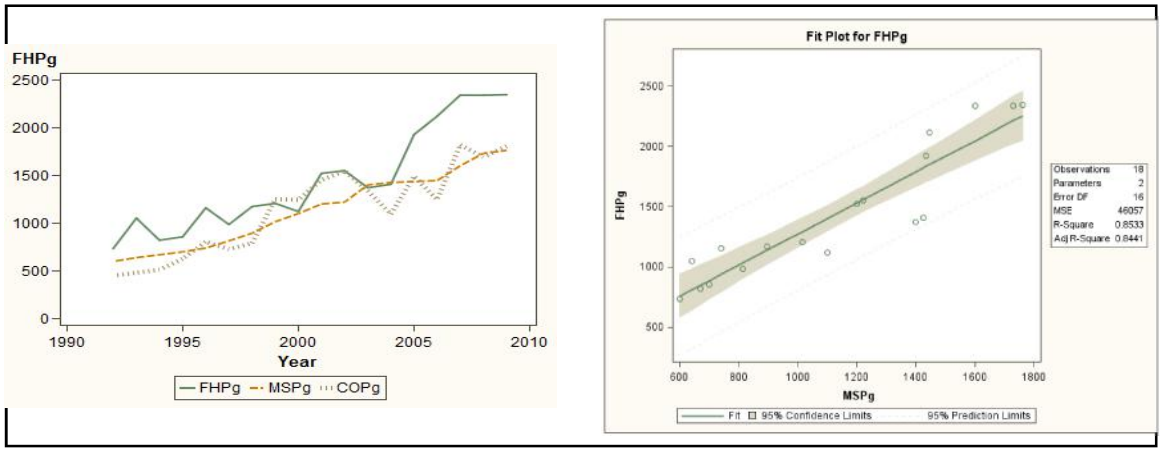

Fig. 4

Table 4: Inter-relationship of prices and cost in Gram

S.No.	No. of Obs.	Linear regression equation	R-Square	S. Error	F-Value	Pr>F
1	18	FHPg= 277.59+1.03COPg	0.7695	0.1412	53.41	<.0001
2	18	MSPg= 250.16+0.77COPg	0.8555	0.0801	94.73	<.0001
3	18	FHPg= -14.41+1.29MSPg	0.8533	0.1336	93.06	<.0001

support prices. Farm harvest prices are affected by minimum support prices and set on a higher plane. The parameter estimate closer to unity (0.94) and high coefficient of determination supports to the fact.

Gram : The movement of farm harvest price, minimum support price and cost of production of gram in Rajasthan are shown in figure 4. The cost of production, minimum support price and farm harvest prices of gram are linear positive growth. For most of the part the cost of production of gram has remained below minimum support price except between the years 1999 to 2002. The farm harvest prices which the farmer gets at village site during harvest season have been consistently above the minimum support price and cost of production. After 2005 the gap between farm harvest price and minimum support price has widened significantly.

The relationship of farm harvest price of gram with its cost of production and that of minimum support price of gram with its cost of production is shown in table 4. It shows that the both the prices are effected significantly by the cost of production of gram. However the effect of changes in cost of production of gram is more prominent on farm harvest price of gram than on minimum support price. The association is more than proportional in case of farm harvest prices whereas it is less than proportional in case of minimum support price with the cost of

production in gram. Minimum support price also have a significant impact on farm harvest prices and they help set it at a higher level. Almost eighty five percent variation in farm harvest price can be explained by variation in minimum support price in case of gram.

CONCLUSION

A significant relationship exists between different type of prices for agricultural crops and their cost of production. Farm harvest prices which the farmers gets at his farm site during harvest period are affected by the minimum support prices and set at a higher level. This relation is highly proportional for wheat gram and less proportional for maize and bajra. Minimum support price s on the other hand are also affected by cost of production of crops as cost of production is one factor among many considered by the government while deciding the support prices. The MSP of wheat and to some extent bajra effectively reflects the changes in cost of production of these crops whereas in maize and gram MSP reflects less proportional changes than changes in their cost of production. The relationship of farm harvest price to cost of production is stronger than the relationship between minimum support price and cost of production. Wheat comes out to be a profitable and maize unprofitable crop for the farmers of Rajasthan.

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SOCIO-ECONOMIC CONSTRAINTS IN MARKETING AND ADOPTION OF GROUNDNUT PRODUCTION TECHNOLOGY IN RAIGAD DISTRICT

Talathi M.S.* and Mahadik R.P.**

ABSTRACT

The present study was conducted in Mahad, Mangaon, Poladpur and Rohatahsils of Raigad district in Konkan region to know the problems perceived by the groundnut growers in adoption of groundnut production technologies and in marketing of groundnut. Also to obtain suggestions from groundnut growers for better adoption of improved technologies and better marketing by interviewing 120 groundnut growers. The constraints faced by the groundnut growers in continuation of the technologies were 'high labour charges' (90%), 'Market availability nearby village is main problem'(90%) 'FYM and fertilizer application, plant protection measures are costly' (75%), 'Costly seed material' (69.16%), 'Unavailability of sufficient quantity of F.Y. M.' (60.33%), 'Less market price to nuts' (60.33%), 'Less technical information to farmers about new varieties (59.17%), 'Damage due to monkey and wild animals' (57.50%), 'Supply of seed material was delayed' (50%), "Oil mill is far away from village (49.17%), "Plastic mulching is not available at village level' (48.33%), 'Nut is being stolen' (48.33%) 'Application of fertilizer is delay due to irregular supply of water' (45.83%) 'Less price for groundnut cake' (45.83%) and 'Less co-operation among groundnut growers. (32.50%). The suggestions were 'more emphasis should be given on Grambijotpadan of groundnut' (71.67 %), Government should be support groundnut growers by providing minimum support price. (59.16%), 'Plastic mulch should be available by the government regularly on subsidized rate' (51.67 %),'input supplying agencies should be promoted to run on co-operative basis within villages' (50.83 %), 'demonstration of groundnut seed sowing machine should be organized' (45.83%)', 'Konkan Trombaytapora seed should be available in time' (40.83 %), and 'Value added industry should be revitalized through NGOs with the help of groundnut growers' (40.83%). It is recommended that more emphasis should be given on Grambijotpatan of groundnut in the area to met out the requirement of seed materail in the cultivable area and plastic mulch should made available on subsidized rate for better promotion of groundnut.

INTRODUCTION

Groundnut (*Arachis hypogaea* L.) is considered as the world's fourth largest source of edible oil. The Raigad district comprises 278.00 hectares area under groundnut crop and had 14.42 q/ha productivity in the year 2013. Due to the efforts of government and non-government agencies the day by day area under groundnut is increasing. But many problems are in adoption of new technology and in marketing of groundnut. Therefore, this study was conducted in Raigad district with following specific objectives.

1. To know the problems perceived by the groundnut growers in adoption of groundnut production technologies and in marketing of groundnut.
2. To obtain suggestions from groundnut growers for better adoption of improved technologies and better marketing.

RESEARCH METHODOLOGY

The present study was conducted in Mahad, Mangaon, Poladpur and Rohatahsils of Raigad district in Konkan region. The district is selected purposively, because area under groundnut cultivation has increased recently. The list of groundnut growing villages was obtained fromTaluka Agriculture Officer. From the list, villages from each tahsil were selected randomly. Total ten villages were selected. The list of groundnut growers in each selected village was obtained from Agriculture Assistant of Agriculture Department and from each selected village, groundnut growers were randomly selected. Thus, the total sample of 120 groundnut growers was selected for the study. Data were collected by conducting personal interview and subjected to appropriate statistical analysis.

*Programme Co-ordinator, Krishi Vigyan Kendra, Roha. Dr. B.S. Konkan Krishi Vidyappeth, Dapoli (Maharashtra).
**Subject Matter Specialist (Ex.), Krishi Vigyan Kendra, Roha. Dr. B.S. Konkan Krishi Vidyappeth, Dapoli (Maharashtra).

RESULTS AND DISCUSSION

The findings of the present study are presented hereunder.

1. Constraints faced by groundnut growers in adoption of technology and marketing of groundnuts: The constraints faced by groundnut growers in adoption of technology and marketing are presented in Table 1.

Table 1.Constraints faced by the groundnut growers in adoption of technology and marketing of groundnuts

S. No.	Constraints	Groundnut growers (N =120)
1.	High labour charges	108 (90.00)
2.	Market availability nearby village is main problem.	108 (90.00)
3.	FYM and fertilizer application, plant protection measures are costly.	90 (75.00)
4	Costly seed material	83 (69.16)
5.	Less market price to nuts	82 (60.33)
6.	Unavailability of sufficient quantity of F.Y. M.	82 (60.33)
7.	Less technical information to farmers about new varieties.	71 (59.17)
8.	Damage due to monkey and wild animals	69 (57.50)
9.	Supply of seed material was delayed.	60 (50.00)
10.	Oil mill is far away from village	59 (49.17)
11.	Plastic mulching is not available at village level	58 (48.33)
12.	Nuts are being stolen	58 (48.33)
13.	Application of fertilizer was delayed due to irregular supply of water.	55(45.83)
14.	Less price for groundnut cake	55 (45.83)
15.	Less co-operation among groundnut growers	39 (32.50)

The constraints faced by the groundnut growers in continuation of the technologies were 'high labour charges' (90%), 'Market availability nearby village is main problem'(90%) 'FYM and fertilizer application, plant protection measures are costly' (75%), 'Costly seed material' (69.16%), 'Unavailability of sufficient quantity of F.Y. M.'(60.33%),' Less market price to nuts' (60.33%), 'Less technical information to farmers about new varieties' (59.17%),' 'Damage due to monkey and wild animals' (57.50%), "Supply of seed material was delayed' (50.00%), "Oil mill is far away from village (49.17%), "Plastic mulching is not available at village level' (48.33%), 'Nut is being stolen' (48.33%) 'Application of fertilizer is delay due to irregular supply of water' (45.83%) 'Less price for groundnut cake' (45.83%) and 'Less co-operation among groundnut growers. (32.50%) in the study area.

2. Suggestions for better adoption of groundnut cultivation technology : The results of the present investigation in respect of suggestions for better adoption of groundnut cultivation technology and better marketing are presented in Table 2.

Table 2. Suggestions to overcome the constraints in adoption and marketing of groundnut

S. No.	Suggestions	Freq-uency	Rank
1	More emphasis should given on Grambijotpadan of groundnut	86 (71.67)	I
2.	Government should be support groundnut growers by providing minimum support price	71 (59.16)	II
3.	Plastic mulch should be available by the government regular on subsidized rate	62 (51.67)	III
4.	Input supplying agencies should be promoted to run on co-operative basis within villages	61 (50.83)	IV
5.	Demonstration of groundnut seed sowing machine should be organized	55 (45.83)	V
6	Konkan Trombaytapora seed should be available in time	49 (40.83)	VI
7.	Value added industry should be revitalized through NGOs with the help of groundnut growers	49 (40.83)	VII

Table 2 reveals that suggestions were 'more

emphasis should be given on Grambijotpadan of groundnut' (71.67 %), Government should be support groundnut growers by providing minimum support price (59.16%), 'Plastic mulch should be available by the government regularly on subsidized rate' (51.67 %),'input supplying agencies should be promoted to run on co-operative basis within villages' (50.83 %), 'demonstration of groundnut seed sowing machine should be organized' (45.83%)', ''Konkan Trombaytapora seed should be available in time' (40.83 %), and 'Value added industry should be revitalized through NGOs with the help of groundnut growers' (40.83%). These suggestions will help in better adoption and marketing of groundnuts in the study area.

CONCLUSION

It is concluded that constraints faced by farmers were mainly unavailability of seed material in time, high labour wages, costly fertilizers and insecticides, unavailability of FYM, market availability, less market rate, lack of complete technical knowhow, lack government support are some of the important constraints perceived by the groundnut growers.

While Gram bijotpadan programme, supportive price and plastic mulch on subsidized rate were some of the important suggestions offered by the respondents for better adoption.

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UTILIZATION OF MASS MEDIA AMONG COLLEGE STUDENTS IN BIKANER DISTRICT OF RAJASTHAN

Monika*, Neena Sareen, Deepali Dhawan*** and Suman Sharma******

ABSTRACT

Mass media influence our daily life more than any other cultural institution. They are our main sources of news and entertainment. They define our purchase decision, voting behaviour, academic achievement and so on. Because of this all-encompassing impact of mass media, politicians, businessmen and government agencies depend on media to influence people. The College students need news/information for various reasons on one hand it can be used to socialize and on the other to make decisions and formulate opinions. The aim of the research was to find out the purpose of utilization of selected mass media among college students. The study concluded that most of the students used multimedia for different purposes such as entertainment programmes, making calls/ receiving call, social networking sites, news items, sports types news, beauty tips, recipes, fashion and educational news.

INTRODUCTION

Mass media are a powerful influence in the present era. Starting from book to internet it has a catalytic action to the wide population. It acts as a mass mobilize unsuspecting of literacy. It distributes message abruptly where administrative can't reach. Mass media touches the heart of the darkest spot of the globe. Mass media really connect the whole universe with a noble mission to share the sorrows and sufferings, pains and strains, success stories of the society. Media weather it is print media or electronic media play an important role in the lives of youth. Internet is quite familiar term for students. Every student in college campus talks about importance of internet. Newspapers provide up-to-date information on local, state/provincial, national, and world issues. Magazines provide information on current happenings around the world; they also provide information for research, entertainment and leisure. College students also watch TV as it is a source of entertainment and enhances their social life. Radio is still the most effective and easily accessible medium of information even in the era of modern technology. Cell phones are an integral part of college life and culture. Even a casual observation of today's college students will reveal cell phones being used, both overtly and covertly, in every possible campus setting, including the classroom. So the present investigation was planned to be conducted on Purpose of mass media Utilization Among College Students in Bikaner District of Rajasthan.

RESEARCH METHODOLOGY

The study was conducted in Bikaner district of Rajasthan. One hundred Boys from Dungar College Bikaner Raj. and One hundred Girls from M.S. College was selected by proportionate random sampling technique from undergraduate level from all the three streams i.e. Arts, Science, and commerce. Data were collected from UG students of Dungar college and M.S. College, Bikaner through survey method using questionnaire. Statistical tools like frequency, percentage etc. were used to analyse the data. The study was delimited to only Undergraduate College students enrolled in the two colleges Dungar College and Maharani Sudarshana College (M.S. College) of Bikaner.

RESULTS AND DISCUSSION

One of the objectives of present investigation was to find out that for which purpose the college students use different electronic and print media. In other words to find out for which category of

*M. Sc. Student, Department of HECM, College of Home Science, SKRAU, Bikaner.
**Professor & Head, Department of HECM, College of Home Science, SKRAU, Bikaner.
***Professor & Dean, Department of HECM, College of Home Science, SKRAU, Bikaner.
****Ph.D. Research Scholar, Agriculture (Extension Education), SKRAU, Bikaner, Rajasthan (334006).

information college students watch television, use mobile, listen radio, surfing internet and print media. Results regarding purpose of using different electronic and print media are given in the preceding section.

1. The purpose for watching Television by the college students: It can be clearly seen from the Table 1 that the purposes for which college students were found watching television were of six types viz., Educational programmes, News programmes, Health programmes, Advertisement , Sports, Entertainment programmes. Table 1 shows that majority of boys (65%) were watching television for entertainment programmes, followed by (56 %) for news, (54%) for sports,(46 %) for education programmes, (25%) for advertisement and (23%) for health programmes. Whereas majority of girls (88%) were watching television for entertainment programmes, followed by (76 %) for news, (42%) for sports,(70 %) for education programmes,(47%) for Advertisement and (50%) for Health programmes. It can be inferred that girls were more interested in watching television as compared to boys. This finding is supported by the findings of Arulchelvan and Viswanathan (2008) and Mishra et.al.(2012).

2. The purpose for listening radio by the college students : Data given in Table 2 revealed that majority of boys (41%) were listening radio for entertainment programmes, followed by (25 %) for news, (24%) for sports, (21 %) for education programmes, (19%) for Advertisement and (20%) for Health programmes. Whereas majority of girls (56%) were listening radio for entertainment programmes, followed by (39 %) for news, (24%) for sports, (32 %) for education programmes, (22%) for Advertisement and (22%) for Health programmes. It can be inferred that girls were more interested in listening radio as compared to boys. This finding is supported by the findings of Arulchelvan and Viswanathan (2008).

Table 1: Distribution of respondents according to the purpose for watching Television

Boys n=100 Girls n=100

S.No.	Purpose of watching television	Television					
		Boys		Girls		Total	
		F	%	F	%	F	%
1.	Educational programmes	46	46.0	70	70.0	116	58.0
2.	News programmes	56	56.0	76	76.0	132	66.0
3.	Health programmes	23	23.0	50	50.0	73	36.5
4.	Advertisement	25	25.0	47	47.0	72	36.0
5	Sports	54	54.0	42	42.0	96	48.0
6.	Entertainment programmes:	65	65.0	88	88.0	153	76.5

Table 2: Distribution of respondents according to the purpose for listening radio

Boys n=100 Girls n=100

S.No.	Purpose of listening radio	Radio					
		Boys		Girls		Total	
		F	%	F	%	F	%
1.	Educational programmes	21	21.0	32	32.0	53	26.5
2.	News programmes	25	25.0	39	39.0	64	32.0
3.	Health programmes	20	20.0	22	22.0	42	21.0
4.	Advertisement	19	19.0	22	22.0	41	20.5
5.	Sports	24	24.0	24	24.0	48	24.0
6.	Entertainment programmes	41	41.0	56	56.0	97	48.5

3. The purpose for using mobile phone by the college students: Data given in Table 3 reveal that majority of boys (100 %) were found using mobile phone for Making calls and receiving calls followed by (94 %) sending SMS, (87%) taking photo, (83%) using as alarm clock ,(81 %) using sound recorder,(80%) using internet in mobile and (80 %) listening to music ,(79 %) using image editor, (79%) using browser the web ,(74 %) using calculator ,(73%) shooting video , (72%) sending and receiving e-mail.,(70%) Put down note or task,(69%) playing games. Whereas, majority of girls (96 %) were found using mobile phone for Making calls /receiving call followed by (90 %) using as alarm clock, (88%) sending sms, (85 %) listening to music, (80%) shooting video ,(79 %) using image editor, (78%) using internet in mobile ,(77%) using browser the web ,(76 %) using calculator,(75 %) using sound recorder, (73%) taking photo (73%) sending and receiving e-mail,(63%) playing games,(60%) Put down note or task. It can be inferred that boys were more interested in using mobile phone as compared to girls. This finding is supported by the findings of Nawaz and Ahmad (2012).

4. The purpose for using internet by the college students: Data given in Table 4 reveal that majority of boys (89 %) were found using internet for chatting, followed by (81 %) for sending mail , (79%) for downloading information ,(76%) for using social networking sites, (71 %) for reading mail, (69%) for image editing (68%) for downloading song, and for, (61 %) for downloading images, (59%), for downloading game. Whereas, majority of girls (81 %) were found using internet for sending mail, followed by (82 %) for chatting, (78%) for downloading information, (76 %) for reading mail, (75 %) for downloading song,(70%) for using internet social networking, (68 %) for downloading images, (67%) for downloading application, (63%) for downloading game,(61%) for image editing. It can be concluded from the finding that majority of respondents both boys and girls were using internet rigoursly. This finding is supported by the findings of Venkata *et al*. (2014).

5. The purpose for reading newspaper and

Table 3: Distribution of respondents according to the purpose for using mobile phone

Boys n=100 Girls n=100

S.No.	Purpose of use mobile phone	Phone					
		Boys		Girls		Total	
		F	%	F	%	F	%
1.	Make calls /receive call	100	100.0	96	96.0	196	98.0
2.	Use as alarm clock	83	83.0	90	90.0	173	86.5
3.	Send SMS	94	94.0	88	88.0	182	91.0
4.	Listen to music	80	80.0	85	85.0	165	82.5
5.	Enjoy mobile games	69	69.0	63	63.0	132	66.0
6.	Use calculator	74	74.0	76	76.0	150	75.0
7.	Put down note or task	70	70.0	60	60.0	130	65.0
8.	Take photo	87	87.0	73	73.0	160	80.0
9.	Shoot video	73	73.0	80	80.0	153	76.5
10.	Sound recorder	81	81.0	75	75.0	156	78.0
11.	Image editor	79	79.0	79	79.0	158	79.0
12.	Browser the web	79	79.0	77	77.0	156	78.0
13.	Send/receive e-mail	72	72.0	73	73.0	145	72.0
14.	Use internet in mobile	80	80.0	78	78.0	158	79.0

Table 4: Distribution of respondents according to the purpose for using internet

Boys n=100 Girls n=100

S.No.	Purpose of internet use	Internet					
		Boys		Girls		Total	
		F	%	F	%	F	%
1.	Chatting	89	89.0	80	80.0	169	84.5
2.	Sending mail	81	81.0	81	81.0	162	81
3.	Reading mail	71	71.0	76	76.0	147	73.5
4.	Downloading information	79	79.0	78	78.0	157	78.5
5.	Downloading songs	68	68.0	75	75.0	143	71.5
6.	Downloading game	59	59.0	63	63.0	122	61
7.	Downloading images	61	61.0	68	68.0	129	64.5
8.	Downloading applications	68	68.0	67	67.0	135	67.5
9.	Image editor	69	69.0	61	61.0	130	65
10.	Use internet social networking	76	76.0	70	70.0	146	73

Table 5: Distribution of respondents according to the purpose for reading newspaper and magazine

Boys n=100 Girls n=100

S.No.	Purpose for reading newspaper and magazine	Newspaper/magazine					
		Boys		Girls		Total	
		F	%	F	%	F	%
1.	News items	81	81.0	87	87.0	168	84.0
2.	Feature articles	41	41.0	54	54.0	95	47.5
3.	Beauty tips	35	35.0	68	68.0	103	51.5
4.	Recipes	28	28.0	77	77.0	105	52.5
5.	Success story	43	43.0	70	70.0	113	56.5
6.	Educational news	54	54.0	75	75.0	129	64.5
7.	Serial story types	39	39.0	63	63.0	102	51.0
8.	Interview types	46	46.0	60	60.0	106	53.0
9.	Family resource management	37	37.0	50	50.0	87	43.5
10.	Advertisement	46	46.0	61	61.0	107	53.5
11.	Question answer types	46	46.0	63	63.0	109	54.5
12.	Sports types	68	68.0	64	64.0	132	66.0
13.	Fashion	46	46.0	60	60.0	106	33.0
14.	Puzzles	47	47.0	66	66.0	113	56.5
15.	Jokes	48	48.0	73	73.0	121	60.5
16.	Cooking method	27	27.0	57	57.0	84	42.0
17.	Health	25	25.0	60	60.0	85	42.5
18.	Popular articles	30	30.0	47	47.0	77	38.5
19.	Matrimonial	28	28.0	49	49.0	77	38.5
20.	Personal problems, issues, matters or topics	27	27.0	40	40.0	67	33.5

magazine by the college students: Data given in Table 5 show that majority of boys (89 %) were reading newspaper and magazine for news items followed by (68 %) for sports news, (54%) for educational news, (47%) for puzzles, (46 %) Fashion, question answer types, Advertisement, and interview types, (43 %) for success story,(41%) feature articles ,(39 %) Serial story types, (37%) for Family resource management, (30%) Popular articles (29%) Beauty tips, (28 %) Matrimonial, (27 %) Cooking method, (27 %) Personal problems, issues, matters or topics, (25%) Health. Whereas, majority of girls (87 %) were reading newspaper and magazine for news items followed by, (75%) for educational news, (70 %) for success story, (66%) for puzzles, (64%) for sports news, (63%) for question answer types, and Serial story types, (61%) for Advertisement, (60%) Health, Fashion, interview types, (57%) Cooking method, (56%) Beauty tips, (54%) feature articles, (50%) for Family resource management, (49 %) Matrimonial, (47%) Popular articles, (40%) Personal problems, issues, matters or topics. It can be concluded that majority of boys and girls were reading newspaper for news item. On the other hand majority of boys were reading news paper and magazine for sports news items and majority of girls were interested in reading fashion, cooking and beauty tips items. This finding is supported by the findings of Tripathi *et al.* (2016).

CONCLUSION

From the above findings it can be concluded that the study conclude majority of boys were found watching television for entertainment programmes, whereas majority of girls were watching television for entertainment programmes. Majority of boys and girls were found using mobile phone for making calls/ receiving call, send sms and use internet in mobile and taking photo. Majority of boys and girls were found using internet for chatting, for sending mail, for downloading information and for using social networking sites. Majority of boys were reading newspaper and magazine for news items, sports types and educational news whereas majority of girls were reading newspaper and magazine for news items, beauty tips, recipes, fashion and educational news.

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SEASONAL WEATHER FORECASTING AND ADAPTATION USING INDIGENOUS KNOWLEDGE SYSTEM WITH ANIMAL FORECASTORS IN KOLLAM DISTRICT, KERALA

Bindu Podikunju* and Suma Mathew**

ABSTRACT

The study focused on how animals' related traditional knowledge is used to forecast weather. The purpose of this study is to show how Indigenous Technical Knowledge (ITK) has been used by aborigines or rural people to predict weather and seasonal changes in their environment. A descriptive survey was conducted using open ended questionnaires and interviews to collect information in order to assess peoples' understanding, attitudes and beliefs on the value of indigenous knowledge on weather prediction. Purposive sampling was applied to collect data from people purported to be rich in indigenous knowledge. The successful application of the forecasting knowledge is based on comparison with past events, observation and thorough understanding of the local environment. The study concludes that both modern and traditional methods have got some positives and weaknesses and can be used together to produce more comprehensive reports of weather forecasts for end users. The information on ITK is useful for end users including farmers, planners, educators, weather forecasters and Non Governmental Organizations [NGO's]. Traditional leaders need to be empowered to assist in the conservation of resources in their communities.

INTRODUCTION

Indigenous technical knowledge of seasonal weather forecasting could be useful in decision making at local level to exploit the seasonal distribution of rainfall in order to stabilize crop farming practices. The small holder farmers are vulnerable to climate change due to its reliance on rainfed agriculture and have the least ability to adapt. The farmers grow crops against a background of limited, and poorly distributed rainfall in space and time resulting in frequent failures. It is therefore important for farmers to integrate the issues of climate variability into resource use and development decisions (Siyakumar, 2006). Seasonal climate forecasts had been used by farmers to make appropriate crop management decisions related to crop choice, planting time, fertilizer use, area planted to a given crop, timing and tillage (Patt & Gwatta, 2002) (Ziervogel, 2004) (Patt, Ogallo, & Hellmuth, 2007). Siyakumar (2006) also argued that the introduction of seasonal climate forecast into management decisions can reduce the vulnerability of rainfed agriculture to droughts and reduce its negative impacts. Seasonal climate forecasts can be conducted based on indigenous knowledge systems indicators or scientific meteorological predictions. The knowledge of the indigenous people should be included when designing adaptations to climate change (Robinson & Herbert, 2001). Traditional weather and climate related practices that farmers of Tamilnadu, Coimbatore district follow in their farming systems to help them in forecasting weather events. These includes insect behaviour (termites, ants and dragon flies), frogs' croaking, dense fog in the morning and high sweating during the day among others (Anandaraja, Radhakrishnan, Ramasubramanian, Saravanan, & Suganthi, 2008). There is inadequate modern/ scientific weather forecasting system in some rural areas. So it is good to promote indigenous technical knowledge system methods there. There is need for research in traditional methods to compliment modern weather forecasting so as to produce more reliable and valid information for end users (Joshua, Dominic, Doreen, Tshuma, & Elias, 2012). In addition those people with valuable information, elders, are passing away and living organisms such as plants and animals are quickly disappearing or extinct due to climate change, over population and other reasons. There are few elders aware of traditional methods of weather forecasting. This makes traditional weather forecasts less reliable. The study aims and concluded

*Assistant Professor, Krishi Vigyan Kendra, Kerala Agricultural University, Kottarakkara
**Senior Research Fellow, Krishi Vigyan Kendra, Kerala Agricultural University, Kottarakkara

that both modern and traditional methods have got some positives and negatives and therefore can be used together to produce more comprehensive reports of weather forecast for end users. The information on indigenous knowledge system is useful for end users including farmers, planners, educators, weather forecasters and non-governmental organizations.

Importance of the study : Kerala is a treasure land of indigenous knowledge in agriculture and allied areas. Scientists throughout the world have started, identifying, documenting and analyzing indigenous technologies in an effort to recommend them to farmers. Despite seasonal forecasts having been issued by national meteorological offices, the extent of uptake is limited (Walker, Mukhala, Van den berg, & Manley, 2001) (Ziervogel, 2001) (Archer, 2003). Traditional agriculture is nothing but indigenous knowledge that can only serve as an alternative to modern agriculture (Arulraj & Vasanthakumar, 1996). Modern scientific weather researches can find ways of blending their findings with indigenous knowledge in order to produce more reliable forecasts as an adaptation strategy in the varying and changing climate. Most small holder farmers, however, have no access to interpret and use satellite meteorological predictions (Nicholls, 2000). So it should be increased the awareness of the indigenous weather system is based on the changes in the local nature, so it may be more accurate and useful for the farmers. The objective of the study was to explore indigenous knowledge system weather forecasts as climate change adaptation strategy in farmers in Southern region of Kerala. The study may illuminate researchers in traditional methods of weather forecasting and how they fit into the current developments in climate variability.

RESEARCH METHODOLOGY

The study was carried out in Kollam district, Kerala. Purposive sampling technique was used in administering questionnaires and interviews. 250 elder participants spread over almost all panchayaths (69 nos) in the above district were issued with questionnaires. Elders were chosen as they were believed to be informed on indigenous knowledge of weather forecasting. A broad stratum of participants was intended to access people's understanding, attitudes, views and beliefs on traditional methods of weather forecasting. These were selected on the basis that they were aged and assumed to be rich on information regarding traditional methods of weather forecasting. These elders have the knowhow of what was done in the past on predicting weather that determined their activities particularly preparation of land, planting and harvesting. Information on demographic characteristics and indigenous knowledge of forecasting the onset of the rain and dry season was collected. Data were both qualitative and quantitative. And the data were analysed and validated with subject specialists and also percentage analysis were done for the studies.

RESULTS AND DISCUSSION

Household Characteristics : Of the 250 respondents that were interviewed, nearly 90% of the respondents were aged 60 years or older which was the main target group for this study. The majority of respondents had zero to ten school years. For their livelihood, respondents grew crops (36%), kept livestock (3%) or did both (35%).

Perception of Farmers on Causes and Effects of Climate Change : Most farmers in Kollam district believed that the climate is changing. Their indicators are low rainfall being received, change in planting season, late rains, rising temperatures, erratic rainfall distribution and drying wetlands. Farmers stated different causes of climate change. They are deforestation, ozone layer depletion, technological advancement and release of industrial gases into atmosphere. They stated that humans play a major role in causing global warming. Some respondents perceive climate change as a purely natural phenomenon without any human intervention being responsible for climate change. Farmers in Kollam district noted different effects of climate change being experienced in their areas. Some of the effects mentioned were decreased yields, changes in planting time and shortage of water. Another impact is rainfall patterns have become highly unpredictable. Some farmers use indigenous knowledge on assessing the potential of a season to rain. The use of Indigenous Technical Knowledge may reduce the impact of climate variability and change on crop

production and livelihood through anticipating and managing annual climate related risks.

Indigenous Knowledge System Indicators : The climate indicators that are used to predict if there is rain or drought include plants, birds, animals, worms, atmospheric factors and even some proverbs and beliefs. Lowland and highland area had many indigenous knowledge weather indicators being used by farmers compared to midland area of Kollam district. Some conditions may be common or endemic in some area and may be rare in other areas. The results show that indicators being used by farmers are different for the different areas as natural resources available, cultural or traditional or social backgrounds that vary with location of the area (Soropa, Gwatibaya, Musiyiwa, Rusere, Mavima, & Kasasa, 2015). Indigenous knowledge forecasts are conducted based on local biophysical and mystical knowledge that has been gained through many decades of experience and are specific to an area (Ziervogel & Opere, 2010). The interpretation of these indicators in use is almost the same amongst the different respondents in different area.
Several indigenous practices or for forecasting weather were identified and some validated indigenous knowledge related to animals was described in this paper (Table 1) (Fig.1).

Respondents gave the indigenous weather and climate forecasts practices by their own experiences and subject experts analyzed and validated the data. Farmers used a number of indicators to forecast weather. The behaviour of animals can reliably be used to predict the onset of rainy season, upcoming rain and the occurrence of flood and drought since animals after their behaviour to suit upcoming natural phenomena (Acharya, 2011).

Frogs in swampy areas start croaking at night is noted as early warning sign for prediction of the start of the rainy season. The scientific reason is observed as the life cycle of frogs directly depends on water. When it rains, it is their best season to mate and establish the survival of the young tadpoles. The croaking sounds made by frogs are their mating calls. Most probably, frogs have the ability to sense atmospheric pressure and humidity. An incoming rain alters these parameters, frog detect these changes and produce the mating calls.

Table 1: Response per cent to ITKs related to animals regarding altitude of Kollam district

n=250

Indigenous Knowledge	% of respondents		
	High-land	Mid-land	Low-land
Prediction: Forthcoming rain			
Croaking of frog	89	42	74
Cattles show restlessness and sniffing the air	74	37	52
Miss Kerala fish emerge from hiding places	56	19	68
Earthworms coming up to the soil surface	82	64	84
Prediction: Forthcoming drought			
Earthworms dig deeper into the soil	82	64	84
Prediction: End of rainy season			
Channa Striata fish move from paddy fields to rivers	48	32	69

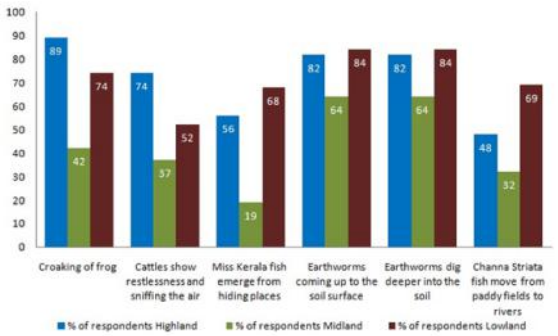

Fig. 1: Response per cent of ITKs related to animals regarding altitude of Kollam district

Cattle are the most common type of large domesticated ungulates. It includes cow, goat etc. Sometimes they show restlessness and sniffing the air with head nose. Most of the farmers' opinioned the activity of the cattle indicates forthcoming rain. Goat huddling together and facing towards sky is

also observed an indicator of upcoming rain. Because cattle have the ability to detect infrasonic sounds. They do identify an incoming storm just hours before their arrival.

Respondents observed that earthworm coming out of ground indicate the onset of rainy season while going deep into the ground indicate the onset of dry season. Earthworms need a minimum humidity in the air for their survival. They will die out in dry conditions. So they have the ability to identify atmospheric humidity. This characteristic attributes for the behaviour regard to weather.

Common snakehead is a freshwater fish and its scientific name is Channa striata. The fish is often found in ponds, paddy fields and also in rivers. Channa striata can be seen coming to the surface of the water to gulp in air. During drought, they bury themselves in mud , and remain there in dormant stage, till the next rain comes. That means they exhibit dormancy, if the habitat becomes dry by immersing themselves in pockets of mud. Studies have shown that migrations by Channa striata were mostly localized, rarely exceeding a distance of 500 meter and not strongly directional (Amilhat & Lorenzen, 2005). During the end of monsoon season they migrate from paddy fields back to rivers. It is probably due to the reverse flow of water from paddy fields back to rivers. So respondents observed that when Channa striata fish move from paddy fields to rivers is an indication of the end of monsoon season.

Miss Kerala or Sahyadria denisonii is a fresh water fish present mostly in shallow streams and are easy to catch during night. It is a stream dwelling fish with an affinity towards rocky pools, edges with thick overhanging vegetation along its banks (Ali, Raghavan, & Dhanukar, 2015). They are evidenced to emerge from hiding places during thunderstorms, may be due to the decrease in light intensity, related to nocturnal behaviour. Nocturnal behaviour in these fishes can be attributed to their shallow habitats and the diurnal behaviour of their major predators, birds. No much studies have been done on this aspect in these fishes.

CONCLUSION

Local indicators used by farmers from Kollam district for seasonal rainfall prediction have been identified from Kollam district, Kerala and validated with the reason. The study found that traditional methods of weather forecasting can be utilized for the purpose of seasonal weather predictions by local communities. Majority of respondents were aware of the indigenous technological knowledge. But low percentage of people are at the moment using it or aware of the methods. The study noted that the elder populations knowledgeable on traditional methods of weather prediction are dying with their oral knowledge. So it should be documented and validated scientifically for the future generation. The modern and traditional weather forecasters can work together to produce a comprehensive weather forecast that is more reliable and meet the needs of local communities. It was also noted that the younger generation need to be acquainted with ideas that are important in weather prediction through indigenous knowledge. Thus ITKs on weather forecasting needs to be encouraged across all age groups and conserved as these are important in weather predictions.

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CORRELATION OF PERSONAL ATTRIBUTES WITH ADOPTION BEHAVIOR OF LEGUME GROWERS IN THAR DESERT, RAJASTHAN

P.S. Bagenia* and J.P. Lakhera**

ABSTRACT

The study was conducted in Bikaner and Jaisalmer districts of Rajasthan with the sample size of 316 respondents who were cultivating arid legume i.e. cluster bean, mothbean, mungbean, horse gram and cowpea since last 5 years. Study revealed that more than half of the respondents were medium risk bearers having medium level of Farm assets, Medium Progressiveness, moderate Achievement motivation. Age group ranging from 31 to above 50 years, Literate upto middle schooling, Medium level of land holding, Partial irrigated farming situations and Annual income ranging from Rs 25,000 to 50,000. Among the variables selected under study Credit behaviour and Economic motivation were non-significantly associated with adoption of arid legume which could affect the adoption of arid legume crops in Rajasthan. However, the rest of the variables namely Age, Education, Size of land holding, Social participation, Farm assets, Achievement motivation, Risk orientation, Training received, Extension participation, Progressiveness, Source of information utilized, Socio- economic status and Knowledge level were related significantly with the adoption of arid legume crops. It bring to the found that all the variables under study exerted their influence in adoption of arid legumes crops except Credit behaviour and Economic motivation.

INTRODUCTION

The agriculture sector is the backbone of the country's economy and all time shelter for bulk of the population which provides employment throughout the year and partially restricts the migration of population from rural to urban areas. In 2007-08, agriculture accounted for 17.8 per cent of India's Gross National Product (GNP), while 70.0 per cent of India's workforce was engaged in farming (Anonymous, 2008). Out of 323 million hectares of the geographical area in India, 123.6 million is cultivated. Out of this 123.6 million, only 40 per cent of the land has fully or partially assured irrigation. The other 60 per cent is either rain-fed or non-cultivable. Arid legumes are grown in large area of 49.69 lakh hectares in India covering Jammu and Kashmir in interior, north to deep in Kerala and from western states of Rajasthan, Gujarat to rear eastern states of Orissa and West Bengal. State wise area is, however, great squared and variable. For instance, being maximum area in Rajasthan (31 lakh hectares), followed by Orissa (4.0 lakh ha.), Maharashtra (3.8 lakh ha), Karnataka (3.7 lakh ha), Gujarat (2.5 lakh ha), Haryana and Madhya Pradesh (1.5 lakh ha) in each. Besides, there are minor states also like, Bihar (60 th. ha), Kerala (75 th. ha), West Bengal, Jammu and Kashmir, Himachal Pradesh and Uttar Pradesh having 9.0, 8.0, 4.0 and 3.0 th. ha area of arid legumes, respectively. India produces 139 lakh tonnes of pulses from an area of 224 lakh hectares with an average production of 598 kg per hectare (2005-06). Whereas, the potentiality of production is more than 12 quintal/hectare in the study area. This wide gap is actual and partial yield of legume crops may be attributed to low level of adoption of scientific production technology.The per unit production of legume crops mainly depends upon the technical know-how and extent of its use by the lagume growers.

Rajasthan comprises of 59.80 per cent (31 lakh ha) of total legume area of the country (51.8 lakh hectare) but production is 42 per cent less than the national average. Pulses grown in scattered and specific agro-climatic, soil and input situations in all over India to meet varied requirements of inhabitants and livestock and legume, viz., clusterbean, cowpea, mothbean, horse gram and mungbean have pivotal and unparallel role in harsher farming conditions. These annual legumes are specifically known for

*T.A. (Ext. Edu.), COA, Bharatpur, SKRAU, Jobner-Jaipur.
**Professor & Head, COA, Bikaner, SKRAU, Bikaner-334006.

sustaining production under extreme drier-eco systems, frequently encountered with harsh and hostile growing environments with unpredicted intensities and intervals. Need-based adaptations of these legumes towards inclement weathers have recognized them as the low priced source of livelihood of farmers surviving on resource constraint arid farming. Contribution of arid legume towards taming droughts, soil health build-up, diversification of agriculture and as a source of organic foods, have pushed them from secondary to front runner legumes of the developing arid and semi-arid regions. These crops may also be grown on undulating lands, sand dunes, rocky soils, sub-plains and sub-maintain zones (Horse gram); in whole of country from and to sub-humid zones (cowpea). Arid legume due to high endosperm gum content is used for great export potential towards western countries. Similarly, cowpea, mungbean and mothbean due to use in several confectionary items of daily uses has industrial base in Bikaner (Bhujia, Dalmoth, mangodies and Papad etc.). Considering the importance of legume crops, an attempt has been made to study the factors affecting adoption of these arid legumes with the following specific objectives:

(1) To study the personal socio-economic and psychological characteristic of arid legume growers.

(2) To explore the relationship between adoption of arid legume crops production technology and characteristic of arid legume growers.

RESEARCH METHODOLOGY

The present study conducted in the year 2013-14 in Thar Desert of Rajasthan state comprises of ten agro-climatic zones and hyper arid partially irrigated western plain Zone-Ic was selected purposely for the study. As this zone is comprised of three districts. Out of these, Bikaner and Jaselmer districts were selected randomly. From the selected districts 50 per cent panchayat samities were selected randomly (total numbers of four panchayat samities were selected out of eight Panchayat samities). Ten per cent gram panchayats were selected from selected panachayat samities and hence, 19 gram panchayats were also randomly selected. One village was randomly selected from each gram panchayat. A list of all the farmers who were growing at least three crops out of five legume crops of the study area i.e. clusterbean, mungbean, mothbean, horse gram and cow pea since last 5 years was prepared from each selected village. From this list 40 per cent respondents were selected randomly. Making of total sample of the 316 respondents. The selected farmers were interviewed with a help of a specially structured schedule. The data were tabulated and analyzed with the help of frequency, per centage, mean, standard deviation, correlation coefficient and multiple regression.

RESULTS AND DISCUSSION

Table 1 reveals that 56.97 per cent of total respondents were in middle Age group of 31 to 50 years, 28.16 per cent farmers were in the old age group of above 50 years, while 14.87 per cent respondents were in the age group of 22 to 30 years, whereas, more than half of the respondents (55.07%) were literate and they could read and write and up to middle schooling, 24.36 per cent farmers belonged to the literate level of education who could neither read and write, while 20.57 per cent farmers had formal schooling. From this educated group, 12.87 per cent farmers were educated upto graduation level, Table also reveals that 53.80 per cent farmers had medium size of land holding, 31.96 per cent farmers were having big size of land holding and 14.24 per cent farmers were having small size of land holding whereas, 47.47 per cent respondents had medium social participation followed by low (38.29%) and high (14.24%) level of social participation. It can be seen from the table that more than 60.13 per cent of the respondents had medium level of farm assets followed by low (20.25%) and high (19.62%) level of farm assets. However, 48.74 per cent of the respondents had medium level of credit behaviour followed by low (37.66%) and high (13.60%) level of credit behaviour. The table further reveals that more than half (58.86%) of the arid legume growers had medium level of achievement motivation, whereas 28.80 per cent and 12.34 per cent of the respondents had high and low level of achievement motivation respectively. Table 1 further indicates that the majority (63.30%) of the respondents were medium level of risk orientation group while, 15.50 and 21.20 per cent farmers had low and high level of risk orientation however, less than 40 per cent of the respondents were in medium level of training

Table 1: Distribution of respondents according to their personal characteristics

Personal Characteristics	Number of respondents	Percen-tage	Mean	S.D.
Age				
Young (up to 30 years)	47	14.87		
Middle (31 to 50 years)	180	56.97		
Old (above 50 years)	89	28.16		
Education				
Illiterate (cannot read and write)	77	24.36		
Literate (read upto middle)	174	55.07		
Educated (above middle school)	65	20.57		
Size of land holding				
Small (below 2.0 ha)	45	14.24		
Medium (2.0 to 6.0 ha.)	170	53.60		
Big (above 6.0 ha)	101	31.96		
Social participation			2.69	1.13
Low (score below 1.68)	121	38.29		
Medium (score from 1.68 to 3.88)	150	47.47		
High(score Above 3.88)	45	14.24		
Farm assets	4.43	3.40		
Low (score below 1.039)	64	20.25		
Medium (score from 1. 039 to 7.95)	190	60.13		
High (score above 7.95)	62	19.62		
Credit behaviour			1.13	1.02
Low (score below 0.334)	119	37.66		
Medium (score from 0.334 to 1.83)	154	48.74		
High (score above 1.83)	43	13.60		
Achievement motivation			3.87	1.19
Low (score below 2.65)	39	12.34		
Medium (score from 2.65 to 4.97)	186	58.88		
High (score above 4.97)	91	28.80		
Risk orientation			84.69	10.09
Low (score below 76.92)	49	15.50		
Medium (score from 76.92 to 98.32)	200	63.30		
High (score above 98.32)	67	21.20		
Training received			1.0	0.89
Low (score below 0.15)	92	29.10		
Medium (score from 0.15 to 1.85)	115	36.40		
High (score above 1.85)	109	34.50		

Cont...

Extension participation			23.37	8.21
Low (score below 15.70)	36	11.40		
Medium (score from 15.70 to 32.24)	206	65.19		
High (score above 32.24)	74	23.41		
Economic motivation			20.29	4.13
Low (score below 16.02)	103	32.60		
Medium (score from 16.02 to 24.62)	142	44.94		
High (score above 24.62)	71	22.46		
Progressiveness			47.98	16.97
Low (score below 30.73)	48	15.18		
Medium (score from 30.73 to 66.17)	186	58.87		
High (score above 66.17)	82	25.95		
Source of information utilized			14.42	4.20
Low (score below 10.17)	43	13.60		
Medium (score from 10.17 to 18.53)	211	66.77		
High (score above 18.53)	62	19.63		
Socio economic status	48.89	21.93		
Low (score below 27.18)	31	09.82		
Medium (score from 27.18 to 72.44)	232	73.41		
High (score above 72.44)	53	16.77		
Annual income				
Low (below Rs. 25000)	82	25.95		
Medium (from Rs. 25000 to 50000)	162	51.26		
High (above Rs. 50000)	72	22.79		
Farming situation				
Rainfed	98	31.01		
Partially irrigated	163	51.59		
Irrigated	55	17.40		
Knowledge level			31.39	7.83
Low (score below 23.16)	69	21.83		
Medium (score from 23.16 to 42.43)	202	63.93		
High (score above 42.43)	45	14.24		

received, 34.50 and 29.10 per cent farmers were having high and low level of training received respectively. In case, extension participation table also indicates that majority (65.19%) of the farmers were having medium level of extension participation however, 23.41 and 11.40 per cent respondents were high and low level of extension participation respectively. It is also apparent from the Table 1 that less than half of the respondents (44.94%) had medium level of economic motivation, while 32.60 per cent and 22.46 per cent farmers had low and high level of economic motivation, whenever majority of the respondents (58.87%) had medium level of progressiveness and 25.95 and 15.18 per cent farmers were having high

and low level of progressiveness respectively.

The data depicts from Table 1 that about two third of the arid legume growers (67.77%) had medium level of source of information utilized, whereas 19.63 and 13.60 per cent growers had high and low level of source of information utilized at locality respectively. It is also clear from the table that majority of the respondents (73.41%) belonged to medium level of socio-economic status, 9.82 and 16.77 per cent respondents were low and high level of socio-economic status. However, 51.26 per cent arid legume growers were found in medium level of income group, while 22.79 and 25.95 per cent growers were having high and low income group respectively. It is apparent from the table that 51.59 per cent farmers possessed partial irrigated farming situations whereas, 31.01 and 17.40 per cent farmers had rainfed and irrigated farming situations respectively.

The findings get strength from the findings of Meti *et al*. 1997, Jaitawat, 2006 and Dangi, K.L., 2008.

In order to find out the influence of selected in dependent variables over dependent variable multiple regression was applied.

In multiple regression analysis 15 independent variables were fitted into explain the variation in extent at adoption of arid legume production technology of the farmers. It may be seen from Table 3 that the selected 15 variables explained to the 67.76 per cent variation in the extent of adoption of arid legume technology by the farmers. The 't' test of statistics shows that this was significant at 1 per cent level. It was revealed from the data that out of 15 variables, only two variables namely, credit behaviour and economic motivation had non-significant effect on the extent of adoption of arid legume production technology. Further, the 't' test of significance indicates that confinement regression (b value) was found positively significant at 1 per cent level of probability were, age, education, size of land holding, social participation, farm assets,

Table 2: Multiple regression analysis between extent of adoption of arid legume growers and their independent variables

S. No.	Independent variables	Byx	SE byx	't' calculated
X1	Age	1.1560	0.4093	2.9713**
X2	Education	1.2932	0.2679	5.0369**
X3	Size of land holding	1.2711	0.5303	2.3901*
X4	Social participation	1.3712	0.3251	4.1120**
X5	Farm assets	0.3196	0.0731	4.2191**
X6	Credit behaviour	2.0138	1.8983	0.907NS
X7	Achievement motivation	0.4431	0.1419	3.0796**
X8	Risk orientation	0.1120	0.0371	2.9116**
X9	Training received	1.1589	0.7833	3.2141**
X10	Extension participation	0.1903	0.0613	3.1456**
X11	Economic motivation	0.0803	0.1298	0.6739NS
X12	Progressiveness	0.6119	0.1419	4.4337**
X13	Source of information utilized	0.3198	0.1232	2.6991**
X14	Socio economic status	0.1360	0.0291	6.4303**
X15	Knowledge level	0.4198	0.0574	7.3135**

R2 = 0.6796 F value = 39.2627 a value -28.89

**Significant at 1 per cent level of significance

*Significant at 5 per cent level of significance

NS = Non-significant

achievement motivation, risk orientation, training received, extension participation, progressiveness, sources of information utilized, socio-economic status and knowledge level.

Similar results were reported by Kumawat (2005), Jaitawat (2006), Dangi (2008), Singh, *et al.* (2009), Tale *et al.*, (2009) and Singh *et al.* (2012).

CONCLUSION

It could be inferred from the study that the more than half of the respondents were Risk bearers having medium Farm assets, Medium Progressiveness, Medium Achievement motivation, Age group ranging from 31 to 50 years, Literate upto middle schooling, Medium level of land holding, Partially irrigated farming situations and Annual income ranging from 25,000 to 50,000, About two-third of respondents were observed in medium level i.e. socio- economic status, source of information utilized and extension participation and relatively lower proportion of the respondents had to prefer medium level of economic motivation and training received, while majority of the farmers were found in medium level of socio-economic status respectively. The results of multiple regression analysis clearly indicated that among the variables selected under study credit behaviour and economic motivation were non-significantly associated with adoption of arid legume, However the rest of the variables namely Age, Education, Size of land holding, Social participation, Farm assets, Achievement motivation, Risk orientation, Training received, Extension participation, Progressiveness, Source of information utilized, Socio- economic status, Knowledge level were related significantly with the adoption of arid legume. It bring to therefore that all the variables under study exerted their influence in adoption of arid legumes except Credit behaviour and Economic motivation.

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ASSOCIATION BETWEEN INDEPENDENT VARIABLES OF FARMERS AND ADOPTION OF GRAM PRODUCTION TECHNOLOGY

H.K. Jhingoniya*, Amit Kumar Keshri , Subham Mishra*** and Rajendra Kumar Meena******

ABSTRACT

The present study was conducted in purposely selected Bikaner district of Rajasthan. Two Panchayat Samities namely Bikaner and Lunkaransar where Krishi Vigyan Kendra conducted it's activities on Gram crop was selected. From the above two Panchayat Samities ten villages were identified and from each village 5 farmers of Gram cultivation were selected randomly and were called as Beneficiary farmers. Equal number of Gram growers from the same villages were also selected to make the study comparable. Thus, a total sample of 100 farmers were included in the study. The data were collected with the help of structured schedule & by personal interview method. Collected data were tabulated & inferences were drawn after subjecting the data to statistical analysis. There was significant association between age, education, size of land holding, annual income, social participation and land holding with level of adoption of Gram production technology by the farmers. The caste and family type of Gram Growers were non-significantly associated with the level of adoption of the respondents.

INTRODUCTION

Krishi Vigyan Kendra play a pivotal role in transfer of agricultural technologies. Krishi Vigyan Kendra is conducting the activities on the basis of mandates prescribed by ICAR. The mandates include conducting On Farm Testing for the refinement of technologies to make them localy suitable and the other activities like Front Line Demonstrations, Trainings, Farmers fair, Exhibitions etc. for quick transfer of technology to the farmers with the addition of other aspects like soil and water testing labs, Model nurseries, Mobile services to the farmers and so on. The Krishi Vigyan Kendra has got the shape of an institution. The Krishi Vigyan Kendra Bikaner has been serving the farming community of the district since 1983. It has been also developing the programmes by identifying the needs of people. The Bikaner is also known for Bikaneri bhujia and papad . The major raw material for preparation of Bikaneri bhujia and papad comes from the Gram. Since the Gram is in demand in the district therefore these crops are grown in larger areas as compared to other crops grown in the district. Gram crop being the important crop of the district were selected in the present investigation.

RESEARCH METHODOLOGY

Bikaner district was selected purposely due to the reason that the major part of Bikaner was under desert and Government paid more attention for developing it. Gram crop was selected on the basis of highest area in the district in kharif season. Bikaner district has six Panchayat samities, namely Bikaner, Lunkaransar, Nokha, Shri Dungargarh, Khajuwala and Kolayat. Bikaner and Lunkarnsar Panchayat samities were selected randomly. List of villages where Krishi Vigyan Kendra had conducted its activities in last five years in both the Panchayat Samities was prepared by taking the data from the Krishi Vigyan Kendra, Bikaner, there were 28 villages in the list. Out of the list ten villages were selected randomly. Hundred farmers (50 Beneficiary & 50 Non-Beneficiary) were selected randomly from the ten randomly selected villages where Krishi Vigyan Kendra, Bikaner have conducted its activities for measuring the adoption of the farmers. The adoption

*Ph.D Scholar (Ext. Edu.), Rajasthan college of Agriculture, MPUAT, Udaipur.
**Ph.D Scholar (Agri. Ext. and Comm.) Allahabad School of Agriculture, SHIATS, Allahabad.
***Ph.D Scholar (Ext. Edu.), Rajasthan college of Agriculture, MPUAT, Udaipur.
****Ph.D Scholar (Ext. Edu.), Rajasthan college of Agriculture, MPUAT, Udaipur.

scale was specially developed to measure the adoption level of farmers about improved package of practices of Gram production technology.

RESULTS AND DISCUSSION

Association between adoption level of farmers and the selected independent variables: Data in Table 1 show that all the seven variables together explained to the extent of 45.42 variation in the adoption of Gram technology by the total farmers. The respective 'F' value was 10.91 which was significant at 1 percent level with 7,42 degree of freedom. Thus, the result implied that all the seven independent variable would account for a significant amount of variation in the personal attributes of the total farmers.

Further, it was observed that the 't' test of significance indicates that coefficient of regression (b-value) were found to be significant for the variables namely Education, Social participation and Occupation at 1 percent level of significance and Land holding at 5 percent level of significant. This means that these variables were the important for predicting the adoption level about Gram production technology by the farmers .The regression coefficient was found non-significant for remaining variables namely Age, Caste and Family type. This leads to the conclusion that these variables were not important with regard to adoption of Gram production technology by the farmers

It was revealed from the same table that the seven independent variables taken together explained to the extent of 59.90 per cent of the variation in the adoption of Gram technology by the Beneficiaries. The respective 'F' significant at 1 percent level at 7,42 degree of freedom which was 8.97. Thus, the result implied that all seven independent variables would account for a significant amount of variation in the adoption level of the Beneficiaries.

Further, 't' test of significance indicates that coefficient of regression (b-value) were found to be significant for the variables i.e. Education, Social participation and Land holding. This means that these variable were the important for predicting the personal profile of the Beneficiary farmers. The regression coefficient found non-significant for remaining variables namely Age, Caste, Occupation and Social participation.

It was also revealed from the same table the seven independent variables taken together explained to

Table 1: Association between personal attributes of Gram growers with their extent of adoption of Gram production technology

S. No.	Personal attributes	Beneficiary farmers (n=50)			Non-Beneficiary farmers (n=50)			Pooled (n=100)		
		b value	Standard error	t value	b value	Standard error	t value	b value	Standard error	t value
1	Age	0.1607	0.098	1.64^{NS}	-0.1557	0.108	1.44^{NS}	-0.0359	0.081	0.44^{NS}
2	Caste	0.018	0.125	0.49^{NS}	0.1273	0.134	0.95^{NS}	0.0478	0.103	0.47^{NS}
3	Education	0.2687	0.094	2.86**	0.0793	0.136	0.58^{NS}	0.2985	0.091	3.28**
4	Occupation	0.1288	0.107	1.20^{NS}	0.3259	0.177	1.84^{NS}	0.3208	0.112	2.85**
5	Social participation	0.1840	0.060	3.07**	0.1222	0.065	1.89^{NS}	0.3082	0.086	3.58**
6	Family type	0.2348	0.140	1.68^{NS}	0.1300	0.060	2.18*	-0.1142	0.118	0.97^{NS}
7	Land holding	0.1604	0.050	3.21**	0.0849	0.152	0.56^{NS}	0.2415	0.098	2.46*

** = Significant at 1% level, * = Significant at 5% level, NS = Non-Significant

Beneficiary farmers	Non-Beneficiary farmers	Pooled
Correlation of coefficient (R^2) = 0.5990	Correlation of coefficient (R^2) = 0.2520	Correlation of coefficient (R^2) = 0.4542
Multiple Correlation (R) = 0.774	Multiple Correlation (R) = 0.502	Multiple Correlation (R) = 0.674
f- Value = 8.97**	f- Value = 2.51*	f- Value = 10.91*
d.f. = 7,42	d.f. = 7,42	d.f. = 7,42

25.20 per cent of variation in the adoption of Gram technology by the Non-Beneficiaries. The respective 'F' significant at 5 percent level at 7,42 degree of freedom which was 2.51. Thus, the result implied that seven independent variables would account for a significant amount of variation in the adoption of the Non-Beneficiaries.

The 't' test of significance indicates that coefficient of regression (b-value) were significant for the variable Family type significant at 5 percent level of significant . This means that this one variable was the most important for predicting the personal profile of the Non-Beneficiaries as compared to rest of the variables under the study. The regression coefficient found non-significant for remaining variables namely Age, Education, Caste, Occupation and Land holding.

Hence, it may be concluded that Education, Land holding, Social participation, and Occupation were the important variables which determined the adoption of Gram technology by the farmers.

CONLCUSION

It can be concluded from the above discussion that there was association between age, education, size of level holding, annual income, social participation with level of adoption of gram production technology.

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GENETIC ANALYSIS IN REPRODUCTIVE TRAITS OF BUFFALOES

P.C. Bhatnagar* and J.L. Choudhary**

ABSTRACT

The data used in this study was collected from All India Coordinated Research Project on Buffaloes, Regional Research Station, Vallabhnagar for Surti and Rajasthan College of Agriculture, Udaipur for Murrah Buffaloes. A total of 782 calving records of 178 Buffaloes spread over a period of 25 years were analysed to estimate the effect of breed, season of calving and parity on reproductive traits. The overall means, least square analysis, heritability estimates and correlation between these reproductive traits were estimated. Findings reported that different reproductive traits have significant and non-significant effect of breed, season of calving and pority of buffaloes.

INTRODUCTION

Milk production in the world is about 769 million tonnes in 2013. India is the world's largest milk producer, with 18 per cent global production, followed by USA, China, Pakistan and Brazil. In India out of 137.7 million tonnes of milk production, 75.7 million from Buffaloes. The population of female buffaloes over 3 years of age is estimated to be 56.58 million, while in case of cattle, it is 76.67 Million.

Unfortunately, buffalos have improved very little over the past 50 years, because of all round apathy to this species, so research on Buffalo breeding in this country has not received much attention except in the recent past. Buffalo is said to be most efficient in utilizing coarse fodder and the nutritionists recommended accordingly. Though experience tells that the best quality green fodder is necessary for high milk production and balance nutrition. Unscientific breeding and poor management system leads to high calf mortality, stunted growth, late maturity, lower milk production and reproductive efficiency.

From economic point of view, there are three segments in the life cycle of dairy animal viz. growth, production and reproduction. Out of these efficient reproduction is most important as the economy of dairy animal revolves around it.

The reproductive traits are influenced by genetic as well as non-genetic factors. Heritability estimates for reproduction traits are very low and indicate that more than 90 per cent of variation is these traits is attributed to environment and very slow improvement is possible by selective breeding. On the contrary, immediate improvement in the reproductive efficiency of a animal can be brought by controlling the environmental factors affecting reproductive traits.

This study has been undertaken to evaluate the influence of season of calving, breed and parity on number of services per conception, age at first conception, age of first calving, gestation period, dry period, calving interval and service period of buffaloes. The present study was conducted with following specific objectives:

1. To evaluate the influence of season of calving, breed and parity on number of services per conception, age at first conception, age at first calving, gestation period, dry period, calving interval and service period in buffaloes.
2. To study the heritability of different reproduction traits.
3. To study correlation between different reproduction traits.

RESEARCH METHODOLOGY

The data used in this investigation were collected on buffaloes maintained at All India Coordinated Research project on Buffaloes, Research Station Vallabhnagar for Surti and Rajastan College of

*Senior SMS (Animal Science), Vidya Bhawan Krishi Vigyan Kendra, Udaipur (Raj.).
**Professor and Head, Department of Animal Production, Rajasthan College of Agriculture, Udaipur (Raj.).

Agriculture (Animal Production Farm), Udaipur for Murrah Buffaloes. The A.I.C.R.P Unit using medium size breeds of Buffaloes viz. Mehsana and Surti and at Udaipur the project started in year 1956 on Murrah breeds. The foundation stock of A.I.C.R.P consisted of 200 Buffalo female calves purchased from Gujarat area, the home tract of these breeds. The bulls of these breeds were also purchased from the Kanjari A.I. Centre, Anand for mating with the Buffaloes under progeny testing programme.

The following reproductive traits were included in the study (1) No. of services per conception (2) Age at first conception (3) Age of first calving (4) Gestation period (5) Dry period (6) Calving interval and (7) Service period. For calculation of these traits, the date of recording was taken into consideration and included in the calculation. Incomplete records due to any reason like abortion, auction or sale etc. were not included in this study.

The data used in this study were collected from A.I.C.R.P Project on buffaloes, Regional Research station, Vallabhnagar for Surti and R.C.A. Udaipur for Murrah Buffaloes. A total of 782 calving records of 178 Buffaloes (123 of Surti and 55 for Murrah) spread over a period of 25 years were analysed to estimate the effect of breed, season of calving and parity on reproductive traits. Breeds were classified as B1 (Murrah) and B2 (Surti) Buffaloes, season of calving S1 (March to June), S2 (July to October) and S3 (November to February), while parity as I, II, III, IV, V and VI lactation number.

Statistical Methods: The overall mean, coefficient of variation and standard variation for each reproductive traits as per breed, season of calving and parity were analyzed using conventional statistical procedures (Snedecar and Cochren, 1968).

Least square constants were inverted using DCM micro system 1101at computer Centre, IASRI, New Delhi. The least square sums of squares for the main effects were obtained by using the following equation (Harveg, 1960) sums of Squares (S.S) = B-1 Z-1 B. The least squares means for the fixed effects included in the model were computed as lincer function of the least square constants.

Heritabilities for all the traits included in this study were estimated by using the paternal half-sib correlation methods. All the methods of measuring heritability test on measuring how much more closely related animals with similar genotype resemble each other than the less closely related animals.

The correlations were estimated by correlating two traits of the same individual. The phenotypic genetic and environmental correlation between traits were computed.

RESULTS AND DISCUSSION

The overall means for number of services per conception, age at first conception, age of first calving, gestation period dry period, calving interval and service period were 1.775 + 0.113, 1302.51 ± 26.81, 1579.22 ± 22.19, 306.98 ± 2.18, 189.85 ± 9.53, 455.63 ± 9.71 and 142.43 ± 13.03 days, respectively.

The least squares analysis of variance of number of services per conception, age at first conception, age at first calving and dry period as per breed were highly significant, whereas non-significant effect on the traits like gestation period, calving interval and service period. The effect of season of calving shows non-significant effect on all reproduction traits except service period. The parity had highly significant effect on all reproductive traits except gestation period.

The h2 estimate of the number of services per conception, age at first conception, age at first calving, gestation period, dry period, calving interval and service period were 0.1712 ± 0.096, 0.1336 ± 0.0244, 0.1348 ± 0.0237, 0.0894 ± 0.076, 0.278 ± 0.137, 0.0601 ± 0.079 and - 0.0007 ± 0.068, respectively. These low h2 in almost all the reproductive traits indicate that these traits are influenced by environmental effect.

There is a positive or significant correlation found between the traits like number of services per conception with age at first calving, age at first conception, dry period, calving interval and service period, age at first conception with age at first calving, age at first calving with gestation period, gestation period with calving interval and service period, dry period with calving interval and service period and calving interval with service period.

Negative or non significant correlation between traits like number of services per conception with

gestation period, age at first conception with gestation period, dry period, calving interval and service period, age at first calving with dry period, calving interval and service period and gestation period with dry period.

CONCLUSION

Different reproductive traits have significant and non-significant effect of breed, season of calving and pority. We are able to study the heritability of different reproductive traits and also able to find the correlation between these traits.

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ADOPTION OF Bt. COTTON PRODUCTION TECHNOLOGY AMONG THE FARMERS IN IRRIGATED NORTH WESTERN PLAIN OF RAJASTHAN

Hans Raj Sain*, J. P. Lakhera, Amit Kumar*** and S.S. Bana******

ABSTRACT

The research study was conducted purposely in Hanumangarh district of Rajasthan. Two Panchayat Samities were selected from district having highest area under Bt. cotton crop. From the selected Panchayat Samities, randomly 5 villages were selected from each Panchayat Samiti. Thus, all the 10 villages were selected for the present investigation. In all, 80 big and 80 small Bt. cotton growers were selected through proportionate random sampling to make a sample size of 160 farmers. Majority of the Bt. cotton growers (62.50%) possessed medium adoption level followed by high (20.00%) and low (17.50%) adoption level of improved Bt. cotton cultivation practices. Significant difference was observed between adoption of big and small farmers.

INTRODUCTION

Cotton (*Gossypium sp*.) is said to be the king of cultivated crops being a main cash crop. Due to its importance in agricultural as well as industrial economy, it is also called as "white Gold of India". Cotton fulfills the need of clothing of human being. It is an important source of fibre and oil. Cotton seeds and seed cakes are important sources of concentrates to animals. Cotton is also used in manufacture of synthetic rubber, soaps, cosmetics, plastic, papers, explosive etc. Cotton is the prime source of natural fibre which is raw material of textile industry. Cotton has provided the most versatile fibre and it continues to rule as the "king of apparel fibre". In India, 2013-14 the total area under cotton crop is 11 million hectare with 35.6 million bales production. Rajasthan covers about 273631 hectares area of Bt. Cotton.

India ranks third in global cotton production after USA and China but per hectare yield of cotton in India is 552 kg per hectare. Pest and disease attack is one of the most important factors affecting yield levels significantly. The loss due to it is to the tune of 13 to 15 per cent which is a serious concern. The bollworm complex causes significant yield losses, further, the harmful effects of insecticides leading to environmental pollution and more specifically increasing the cost of cultivation. In this context the application of biotechnology was seen as a solution and thus the efforts have resulted in developing of Bt. cotton. Bt. is a genetically engineered crop, hence is referred transgenic cotton. Bt. cotton contains a toxic protein inducing gene from soil bore bacterium Bacillus thuringiensis, thus enabling the crop to produce toxin resulting in decrease bollworms infestation, reduced application of insecticides, increase the productivity, quality of fibre and provide safety to the farmers. An attempt was made in present to know the profile of Bt. cotton growers and to find out adoption of Bt. cotton production technology. The present study was undertaken with specific objective, “to assess the extent of adoption of recommended Bt. cotton production technology by the big and small farmers”.

RESEARCH METHODOLOGY

Selection of district was based on purposive sampling method. The present investigation was conducted in Hanumangarh district which had the highest area under Bt. cotton as compared to other districts of Rajasthan. Two Panchayat Samities namely Hanumangarh and Sangaria were selected for the investigation which possessed highest production

*P. G. Student, Department of Extension Education, College of Agriculture, SKRAU, Bikaner (Rajasthan).
**Professor & Head, Department of Extension Education, SKRAU, Bikaner (Rajasthan).
***Ph.D Scholar, Department of Extension Education, College of Agriculture, SKRAU, Bikaner (Rajasthan).
****AAO, Department of Agriculture, Govt. of Rajasthan.

of Bt. cotton crop. Complete lists of all the major Bt. cotton growing villages were prepared with the help of Revenue Patwari and personnel from the Agriculture Department from the selected Panchayat Samities. Randomly 5 villages were selected from each identified Panchayat Samiti. Thus, in all 10 villages were selected for the present investigation. In all, 80 big and 80 small Bt. cotton growers were selected through proportionate random sampling to make a sample size of 160 farmers. Data were collected by personal interview method.

RESULTS AND DISCUSSION

It might be due to the fact that big farmers remained in continuous touch with the extension personnel throughout the session of the demonstration so they might have acquired sufficient skills pertaining to Bt. cotton cultivation practices. Thus, they are more likely to practice the learnt skills in their fields.

Table 1 shows that in case of big farmers, majority (60.00%) had medium adoption about Bt. cotton production technology followed by high (25.00%) and low adoption category (15.00%), respectively. Further, in case of small farmers, majority of the farmers (65.00%) belonged to medium adoption category followed by low adoption category (20.00%). Only (15.00%) small Bt. cotton growers fell in high adoption category concerning Bt. cotton production technology. If we look at the data presented in the Table 1 as a whole, irrespective of type of farmers i.e. Big and small farmers, the data revealed that only 32 (20.00%) farmers were high adopters, 100 (62.50%) farmers were medium level adopters and 28 (17.50%) farmers were in the category of low adoption of Bt. cotton cultivation practices in the study area. The findings are in line with the findings of Patel et al. (2000), Manhas et al. (2003) and Bondarwad et al. (2010) revealed that majority of the farmers were

Table 1: Distribution of Bt. cotton growers according to their extent of adoption (N=160)

S.No.	Extent of adoption	Big Farmers		Small Farmers		Pooled	
		f	%	f	%	f	%
1	Low (<65 score)	12	15.00	16	20.00	28	17.50
2	Medium (65-88 score)	48	60.00	52	65.00	100	62.50
3	High (>88 score)	20	25.00	12	15.00	32	20.00

f = frequency, %= Percentage, n= number of respondents

Table 2: Extent of adoption of big and small farmers about Bt. cotton production technology (N=160)

S.No.	Package of practices	Big Farmers		Small Farmers		Pooled	
		MPS	Rank	MPS	Rank	MPS	Rank
1	Field preparation	71.25	VII	62.50	VIII	66.88	VIII
2	Use of high yielding varieties	100.00	I	100.00	I	100.00	I
3	Seed treatment	70.83	VIII	64.58	VII	67.71	VII
4	Time of sowing	80.54	IV	80.10	III	80.32	IV
5	Seed rate	82.50	III	80.00	IV	81.25	III
6	Manure and fertilizer application	87.50	II	84.46	II	85.98	II
7	Weed management	75.56	VI	73.68	V	74.62	V
8	Irrigation management	76.09	V	68.59	VI	72.34	VI
9	Plant protection measures	69.77	IX	61.69	IX	65.73	IX
10	Harvesting and storage	64.69	X	58.13	X	61.41	X
	Overall	**77.87**		**73.37**		**75.62**	
			r_s =0.96		t=10.20**		

r_s = Rank correlation, ** = Significant at 1% level of significance

having medium extent of adoption of recommended Bt. Cotton production technology.

If we look at the Table 2 irrespective of big and small farmers, then it is observed that respondents had very good extent of adoption regarding use of high yielding varieties, manure & fertilizer application and seed rate with 100, 85.98 and 81.25 MPS, respectively. They had good extent of adoption regarding time of sowing, weed management, irrigation management, seed treatment and field preparation with 80.32, 74.62, 72.34, 67.71 and 66.88 MPS followed by low extent of adoption in practices like plant protection measures and harvesting & storage with 65.73 and 61.41 MPS, respectively. The overall extent of adoption of the big farmers (77.87 MPS) was higher than the small farmers (73.37 MPS).

The value of calculated rank correlation (rs) was 0.96 which is positive and significant at 1 per cent level of significance, leading to conclusion that there was a similarity in rank assignment pattern of extent of adoption of big and small farmers about Bt. cotton production technology, though there was a difference in the magnitude of MPS of big and small farmers.

Table 3 elucidates that among ten important packages of practices of Bt. cotton cultivation, three practices i.e. field preparation, time of sowing and seed rate showed non-significant difference in the extent of adoption of big and small farmers. In three practices of Bt. cotton cultivation, there was a highly significant difference in the extent of adoption of big and small farmers as their calculated 'Z' value was higher than the tabulated 'Z' value at 1 per cent level of significance. In remaining four practices of Bt. cotton cultivation, there was a significant difference in the extent of adoption of big and small farmers as their calculated 'Z' value was higher than the tabulated 'Z' value at 5 per cent level of significance. Overall calculated 'Z' value was higher than the tabulated value at 5 per cent level of significance leading to the conclusion that there was a noteworthy difference in extent of adoption between big and small farmers regarding Bt. cotton production technology. It might be due to the fact that big farmers remained in continuous touch with the extension personnel throughout the session of the demonstration so they might have acquired sufficient skills pertaining to Bt. cotton cultivation practices. Thus, they are more likely to practice the learnt skills in their fields.

The findings of the study are in compliance with the findings of Ban *et al*. (2010), Jansirani (2011) and Bilal *et al*. (2012) found that among practice wise

Table 3: Practice wise comparison of extent of adoption between Big and Small farmers regarding Bt. cotton production technology

S.No.	Package of practices	Big Farmers		Small Farmers		'Z' Value
		Mean ±	S.D.	Mean ±	S.D.	
1	Field preparation	5.70	3.64	5.00	3.90	1.17 NS
2	Use of high yielding varieties	12.00	0.00	12.00	0.00	?**
3	Seed treatment	4.27	1.17	3.88	1.16	2.12*
4	Time of sowing	9.67	0.58	9.61	0.55	0.67 NS
5	Seed rate	5.78	2.68	5.60	2.82	0.41 NS
6	Manure and fertilizer application	12.25	1.21	11.83	1.11	2.29*
7	Weed management	6.80	1.57	6.35	1.23	2.02*
8	Irrigation management	6.09	1.40	5.49	0.98	3.14**
9	Plant protection measures	11.16	2.72	9.87	2.84	2.93**
10	Harvesting and storage	5.35	1.92	4.65	1.58	2.52*
	Overall	**7.89**	**1.70**	**7.46**	**1.59**	**2.12***

NS = Non-significant, ** = Significant at 1% level of significance, * = Significant at 5 % level of significance

higher adoption was found in practices like higher lint yield, time of planting and selection of proper soil type practices had good adoption regarding mustard production technology.

CONCLUSION

Majority of Bt. cotton growers had good adoption about improved package of practices of Bt. cotton cultivation. Big and Small farmers possessed comparatively very good extent of adoption regarding use of high yielding varieties, manure & fertilizer application and seed rate. They had good extent of adoption regarding time of sowing, weed management, irrigation management, seed treatment and field preparation. Followed by low extent of adoption in practices like plant protection measures and harvesting & storage, respectively.

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INFORMATION COMMUNICATION TECHNOLOGY UTILIZATION PATTERN BY UNIVERSITY TEACHERS

Arpita Sharma*

ABSTRACT

University has three mandates: Teaching, Research and Extension. Scientists and Professors of State Universities are continuously engaged in teaching, research and extension activities. Professional growth of scientists and professors can be enhanced by the proper knowledge and use of new Information Communication technologies. ICT is an umbrella term which include all type of media for cognitive and psychomotor development. A research study was conducted among 40 scientists of GBPUA&T, Pantnagar to analyze their extent and pattern of utilization of ICT tools. The study revealed that most commonly used ICTs tools by the University teachers were mobile phone, computer, internet and e-mail. They used ICTs mainly for sending/receiving e-mail, professional networking and downloading information from the internet, writing research papers, updating teaching notes, preparing presentations and developing projects and tests for the students. The recommendations of research investigation are - there is an urgent need to strengthen the skills of using and handling ICTs and there is also need of capacity building training courses and module for use of new and innovative systems for handling and use of ICTs.

INTRODUCTION

Information and communication technology (ICT) is an umbrella term and has positive impact on the development of Nation. Today ICTs has changed the relationship between teachers and students. According to Mudrak (2004), common Information Communication Technologies are: computer, video and cassette, projectors, internet, camera, television. ICT tools are necessary to make teaching and learning process more effective. Adequate technologies are necessary to enhance effective teaching and learning process. Drucker (2006) also said that the use of adequate and appropriate communication and information tools can lead to effective teaching and learning. He further explained that teaching is the process to impart knowledge to learners. Information and communication technology (ICTs) is the modern science of gathering, storing, manipulating, processing and communicating desired type of information in a specific environment. Computer technology and communication technology are the main supporting pillars of this technology and the impact of these two, in the information storage and dissemination is vital (Mahajan, 2002). G.B. Pant University of Agriculture & Technology, Pantnagar is a foremost Agriculture University having fully operational computer labs, smart classroom in all the colleges. Although scientists of this University are using ICTs but researchable questions are [1] What types of ICTs they are using? [2] To what extent they are using Information Communication Technologies for improving their professional efficiency? The present study was undertaken among the Agricultural Scientists of GBPUA&T, Pantnagar with following objectives: [1] To study the utilization pattern of Information Communication Technology.

RESEARCH METHODOLOGY

A survey was carried out from June-July 2017 on University teachers of GBPUA&T, Pantnagar. A Simple Random Sampling was used for the study. Total 40 University teachers were selected for the study. The semi-structures interview schedule was developed to study the utilization pattern of ICTs.

RESULTS AND DISCUSSION

Data presented in Table 1 reveal that 42.5 per cent respondents were Professors followed by Associate Professor (30%) and Assistant Professor (27.5%) in the sample of study.

*Assistant Professor, Dept of Agricultural Communication, College of Agriculture, GBPUA&T, Pantnagar.

Table 1: Distribution of respondents according to their designation

S.No.	Designation	No.	Percentage
1.	Assistant Professor	11	27.50
2.	Associate Professor	12	30.00
3.	Professor	17	42.50

Mobile Phone Utilization Pattern:

1. Mobile Ownership: Total 100 per cent scientists owned mobile phone. This is supported by the findings of Singh and Singh (2017) that majority of faculty members owned mobile phone.
2. Brand of mobile owned: Total 27.5 per cent scientists have Lenovo brand mobile phone followed by Vivo (22.5 per cent). Total 15 per cent scientists have Motorola phone followed by Samsung (12.5 per cent) and Nokia/Micromax (7.5 per cent). Only 5 per cent respondents have Apple and Redmi Mobile phone.
3. Type of Sim: Total 92.5 per cent respondents possessed double sim followed by single sim (5 per cent).
4. Mobile services being used: Total 87.5 per cent of the respondents were using Idea services followed by Jio (42.5%) services. Total 35 per cent respondents were using Airtel mobile services followed by Vodafone services (30 per cent).
5. Approximate monthly expenditure on mobile phone: It was found that total 75 per cent respondents were spending 500 Rs as monthly expenditure on mobile phone followed by Rs. 500-1000Rs by 22.5 per cen respondents and above Rs. 1000 by 2.5 per cent, respondents.

Internet Utilization Pattern: Data presented in Table 3 indicate that more than half per cent of the respondents (62.5%) were using Internet daily followed by weekly (30%) and occasionally (5%). It is fairly clear from the findings that the use of ICT in updating knowledge level and teaching skills by the university teachers was to a great extent. Moreover, ICT is helping teachers in setting innovative projects for students and generating computer online quiz, online test, online discussion forum.

Table 2: Mobile Utilization Pattern among the respondents

S. No.	Mobile Phone Utilization Pattern	No.	Per Centage
1. Mobile Ownership		40	100
2. *Brand of mobile owned			
a.	Sony	6	30
b.	Lenovo	11	27.5
c.	Vivo	9	22.5
d.	Nokia/Micromax	3	7.5
e.	Motorola	6	15
f.	Apple	2	5
g.	Samsung	5	12.5
h.	Redmi	2	5
3. Type of Sim			
a.	Single	2	5
b.	Double	37	92.5
4.Mobile services being used			
a.	BSNL	10	25
b.	Airtel	14	35
c.	Vodafone	12	30
d.	Idea	35	87.5
e.	Jio	17	42.5
5. Approximate monthly expenditure on mobile			
a.	Below Rs. 500	30	75
b.	Rs. 500-1000	9	22.5
c.	Above Rs. 1000	1	2.5

**Multiple responses were allowed

Extent of use of ICT for various purposes: Table 3 reveals that total 97.5 per cent respondents were using ICT for data analysis and treatment and communicating with students followed by (92.5%) in writing research and conceptual papers. Most of the respondents (95%) were using Internet for acquiring and updating knowledge in the area of specialization followed by self improvement (90%). More than three fourth of respondents (87.5%) were using Internet for teaching/professional competence followed by participation in seminars, workshop and conferences (72.5%). Only 30 per cent respondents were using Internet for Sharing professional information and

findings. Total 47.5 per cent respondents were using Internet for Research project work. Research finding are supported by Jones and Johnson (2005) who revealed that marjory of faculty used internet to communicate with the students, particularly e-mail, enhance college faculty's communications with their students. Nearly all college faculty members surveyed reported using the Internet to communicate with their students (98%) in the study area.

Table 3: Internet utilization pattern among the respondents

S. No.	Internet Utilization Pattern	No.	Per Centage
1.	Daily	25	62.5
2.	Weekly	12	30
3.	Occasionally	2	5
Extent of use of ICT			
1.	Writing research & conceptual papers	37	92.5
2.	Participation in seminars, workshop & conferences	29	72.5
4.	Sharing professional information & findings	12	30
5.	Data analysis & treatment	39	97.5
6.	Research project work	19	47.5
7.	Teaching/ Professional competence	35	87.5
8.	Acquiring and updating knowledge in the area of specialization	38	95
9.	Self improvement	36	90
10.	Communication with students	39	97.5

Use of Social Media: Analysis of Table 4 shows that majority of respondents (87.5%) were using Whatsapp followed by facebook (30%), LinkedIn (27.5%) and research gate (22.5%). Only 12.5 per respondents were using twitter followed by You Tube (20%) in the study area.

Purposes for using social media: Table 5 indicates that total 65 per cent respondents were agree with the statement that "they use social media for communicating and interacting with friends". While total 80 per cent respondents were agree with the statement that "they were using social media for online learning" followed by the statement "they used social media for academic purposes" (57.5%). It was noted that 30 per cent respondents used social media for accepted communicating, mobilizing and National or International level conferences, Seminars, whereas 37.5 per cent respondents who were using social media for updating profile information.

Table 4: Use of social media by the respondents

S.No.	Social Media	No.	Per Centage
1.	Facebook	12	30
2.	Twitter	5	12.5
3.	You tube	8	20
4.	WhatsApp	35	87.5
5.	Research Gate	9	22.5
6.	Linked In	11	27.5

CONCLUSION

From the above findings, it can be concluded that all the scientists were using Information Communication Technologies to update notes, for writing research and conceptual papers and teaching/professional competence, participation in seminars, workshop and conferences, for acquiring and updating knowledge in the area of specialization, for self improvement etc. ICT is helping teachers in setting innovative projects for students and generating computer online quiz, online test, online discussion forum. Most of the respondents were using Internet for Sharing professional information and findings for Research project work. University teachers were using social media as whatsapp, facebook etc. Most of the scientists were agree with the statement that they use social media for communicating and interacting with friends, for online learning, for academic purposes, for accepted communicating, mobilizing and organizing National and International seminars. Based on findings, it can also be concluded that ICT is an innovative tool for teaching and learning. To

Table 5: Purposes for using social media by the respondents

S. No.	Statements	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly agree
1)	I use social media for communicating and . interacting with friends	5 (12.5)	26 (65)	2 (5)	4 (10)	3 (7.5)
2)	I use social media for online learning.	32 (80)	7 (17.5)	1 (2.5)	0	0
3)	I use social media for academic purposes.	23 (57.5)	11 (27.5)	5 (12.5)	0	0
4)	I use social media for accepted communicating, mobilizing and organizing National or International level conferences, Seminars.	5 (12.5)	12 (30)	10 (25)	9 (22.5)	4 (10)
5)	I use social media for updating profile information.	15 (37.5)	14 (35)	7 (17.5)	4 (10)	0

[SA=Strongly agree, A=Agree, D=Disagree SD= Strongly disagree]

encourage more use of ICTs, there is a need to strengthen the existing facilities and infrastructure. There is also an urgent need to change traditional classrooms into smart classrooms. There is also a need to develop modules for the use of new and innovative technologies to make teaching learning process more effective.

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SUITABILITY ASSESSMENT OF DEVELOPED PROTECTIVE CLOTHING AND ACCESSORIES AMONG THE DAL MILL WORKERS

Sudha Babel*, Latika Sachihar and Rupali Gupta*****

ABSTRACT

Occupational diseases are caused by a pathologic response of the patients to their working environment. In India; around 20 million workers are involved in mill industry. With rapid industrialization of the developing world, flour, powder dust induced lung diseases are poised to become a global health problem. In various industries, worker's health is not given so much importance due to ignorance, exploitation, illiteracy and or poverty. In dal mills hazardous working condition may lead them towards the degradation of worker's health and thus, supports the onset of severe diseases like respiratory tract disorder, infections and noise pollution. Therefore, protective work wears are the only way to prevent them from ingesting or inhaling Dal powder, and dust. Present study is based on the development of protective wears and their wear trail, impact and wearer's response and its adoption feasibility. The results revealed that developed designs of Apron (with hood and without hood), gloves, Hood mask, Pleated mask, Beak mask, Triangular mask, Knitted fabric mask, ear muff and goggles were found suitable of the given purpose as the maximum number of respondents accepted that all work wear are suitable in all the parameters like design, easy wear and care, fabric properties wearing time, suitability/protection, durability/serviceability.

INTRODUCTION

Dust is a hazardous substance, it is a respiratory sensitizer and is known to cause allergic rhinitis and occupational asthma among bakers and millers. Asthma arising from workplace exposure to cereal flour (bakers' asthma) is one of the commonest types of occupational asthma. It is also an irritant and may give rise to short term respiratory, nasal and eye symptoms or it may provoke an asthmatic attack in individuals with pre-existing disease and also lead to chronic bronchitis. The respiratory health effects have been documented in workers exposed to a variety of dusts in small and large-scale industries, which generate dust during their production process. The diseases of the respiratory system induced by occupational dusts are influenced by the type of dust, dose, duration of exposure and genetic factors. Worker's health is largely affected by workplace environment directly or indirectly. In Dal, Flour and Spice mills workers remain in continuous exposures to powder dust. Environment of dal, spice and flour mills are full of solid particles that are dal powder dust which is ingested or inhaled by the workers which later produces a number of lung diseases and respiratory tract and eyes infections, hearing loss and inflammation. Van der Walt, A. *et al.* (2013). "Work-related allergic respiratory disease and asthma in spice mill workers is associated with inhalant chilli pepper and garlic exposures" Exposure to inhalable spice dust at work, particularly that containing garlic and chilli pepper allergens, increases the risk of allergic respiratory disease and asthma. Dust particulate mass rates were highest in work areas where spices are blended, and spice-dust-related asthma like symptoms were common (identified in 17% of workers), as was garlic sensitization (19%). Asthma was more strongly associated with chilli pepper than with garlic sensitization, the authors found.

It is found in the study of "Incidence of silicosis in flourmill workers" done by Amrita Athavale et al (2011) that 30.4 per cent flour mill worker had silicosis. Occupational asthma and other respiratory diseases are common hazards which occur due to the long term exposure to wheat flour. As these workers generally uses an old cloth/ towel/ scarf, shirt or any

*Professor & Head, Deptt of Textiles & Apparel Designing, College of Home Science, MPUAT, Udaipur.
**Research fellow, Deptt of Textiles & Apparel Designing, College of Home Science, MPUAT, Udaipur.
***Research fellow, Deptt of Textiles & Apparel Designing, College of Home Science, MPUAT, Udaipur.

other kind of protection, which cannot serve them in facilitating complete protection.

Babel, Sharma and Rajvanshi (2014) concluded that Dal mill workers faced by the major problems related to skin allergies, coughing and sneezing, eye irritation, breathlessness due to presence of fine organic dust in the work environment. Majority of male respondents were wearing *dhoti kurta* followed by pant shirt, while female were wearing *blouse, Ordhni* and *Ghaghara.* None of the respondents was wearing the personal protective clothing during work. It is recommended that awareness should be generated among Dal mill workers about the use of personnel protective devices like apron, face mask and ear muffs.

In order to prevent of these problems some kind of personal protection is necessary to prevent dust from entering into the body through respiration, swallowing and avoiding its skin contact as well. Personal protective equipment (PPE) refers to protective clothing, apron, helmets, goggles, or other garments or equipment designed to protect the wearer's body from dust & injury etc. The hazards addressed by protective equipment include physical, electrical, heat, chemicals, biohazards, and airborne particulate matter. Everyone wears clothing. We do it to protect ourselves from the elements and to avoid being arrested. However, not all clothing is considered equal when it comes to protecting our skin. Protective equipment may be worn for job-related occupational safety and health purposes. These protection may be a obtained by protective clothing like masks, respirators, aprons, gloves, socks, eye and ear wear etc. The objective of present study is to assess the suitability of functional clothing and accessories among the Dal Mill workers.

RESEARCH METHODOLOGY

In the present study appropriate functional clothing were designed and developed in the research lab of AICRP- CT MPUAT. To test the appropriateness of the designed and developed clothing and accessories field testing was carried out on Dal mill workers . The designed and developed clothing and accessories were given for wear trial for seven days. For the purpose 10 workers working in Dal mill were selected purposively. To measure the response three point rating scale was developed weighted mean score (WMS) was calculated. On the basis of WMS Suitability level was decided as: highly suitable: 2.34-3.00, suitable: 1.67-2.33, somewhat suitable 1.00-1.66.

RESULTS AND DISCUSSION

General information

As per the responses recorded, 80 per cent respondents are of the age between 31-40 and 20 per cent of 41-50, 60 per cent of them are educated 1^{st} to 5^{th} , 40 per cent, 6^{th} to 10^{th}, family income of 80 per cent workers is between 10000 – 20000 while of 20 per cent is above 20000. 60 per cent of them are living in nuclear families while 40 per cent in joint families (Table 1).

Table 1: General information of the respondents

S.No.	Aspects	Category	Percent-age
1	**Age**	31-40	80
		41-50	20
2.	**Education**	1^{st} to 5^{th}	60
		6^{th} to 10^{th}	40
3.	**Income(year)**	10000-20000	80
		Above 20000	20
4.	**Family type**	Nuclear	60
		Joint	40

Assessment of functional clothing and accessories:

Apron with hood: Data in Table 2 shows that design assessment got 2.8 (Highly suitable) overall WMS. Comfort assessment, 2.5 (highly suitable) and fabric obtained overall WMS 2.46 (highly suitable), durability/serviceability secured 2.6 (highly suitable) and last adoption feasibility secured 2.1 (suitable). Its scores were very high because it was much fitted in the whole body organs and wearer responded that they could cover head also. Respondents said that it can put on and put off easily and one can work comfortably.

Apron without hood: While evaluating the responses about the apron without hood they reported that apron is suitable for their work. In design

aspect overall WMS was reported 1.86 (suitable), comfort assessment got 2.5 (highly suitable), fabric secured 2.46 (highly Suitable), durability or serviceability reported 2.3 (suitable) and adoption feasibility secured 1.6 (somewhat suitable) overall WMS. So overall WMS little bit good results were found in case of apron without hood. Apron without hood were properly fitted in body but respondents said that did not cover the hood.

Table 2: Suitability assessment of different types of apron by Dal mill workers

S.No.	Functional features of apron	Suitability score	WMS
		Apron with hood	Apron without hood
1.	**Design assessment**		
a.	Overall Appearance	2.2	2.3
b.	Drapes well when used	1.7	1.5
c.	Covers entire body	2.3	1.8
2.	**Comfort assessment**		
a.	Easy to wear	2.6	2.6
b.	Easy to remove	2.8	2.75
c.	Easily movement during working	2.1	2.2
3.	**Fabric**		
I.	Texture	2.6	2.6
II.	Thickness	2.3	2.3
III.	Softness/Stiffness	2.5	2.5
IV.	Breathable	2.3	2.3
V.	Protects from dust	2.6	2.6
VI.	Absorbency of perspiration	2.5	2.5
4.	**Durability/ Serviceability**	2.6	2.3
5.	**Adoption feasibility**	2.1	2.0

Comparison between apron with hood and without hood: Comparison between of apron with hood and without hood **(**Table 3), two aspects are given by Dal mill worker (highly suitable).Overall appearance WMS was high in apron with hood in comparisons to without hood apron. In comfort assessment and fabric case apron without hood and with hood recorded as same responses. Design assessment WMS was good in with hood apron as compared to without hood and durability/serviceability was found 2.6 (highly suitable) in hood apron but without hood apron secured 2.3. Adoption feasibility got 2.1 (suitable) in apron with hood but apron with hood slightly less adoption feasibility (2.0).

Table 3: Comparison between aprons with hood and without hood

No.	Functional feature of apron	(Overall WMS) of Aprons	
		Apron with hood	Apron without hood
1.	Design assessment	2.8	1.86
2.	Comfort assessment	2.5	2.5
3.	Fabric	2.46	2.46
4.	Suitability or Serviceability	2.6	2.3
5.	Adoption feasibility	2.1	2.0

Assessments of face mask: There is an urgent need for prevention programs, such as local and general ventilation and using appropriate respiratory masks that can play an important role in reducing exposure to flour dust. Also the use of new equipment and also enclosing the production process can reduce dust emissions in the air. Suggests - Majid Bagheri Hosseinabadi *et al.* (2013). To protect the workers different types of masks were designed and developed under AICRP-CT were given for wear Trial to Dal Mill workers. Babel and Rajvanshi (2013) stated that even after proper cleaning operations in flour mills, the flour milling may not be able to reduce the flour dust levels to below the TLV of 0.5 mg/m^3. So the face masks in the work area are highly recommended. This would help to protect the workers health from the flour dust prevalent in the workplace environment. Suitability assessment data are reported in Table 4

Hood mask: Data presented in Table 4 shows that design assessment of hood mask overall WMS was 2.8, comfort assessment's highly suitability was 2.5, fabric secured 2.46, durability/serviceability reporter 2.6 and adoption feasibility also got 2.1 overall WMS. That means all aspects of garment's features came

under highly suitability. Hood mask made by hosiery fabric and cover the full face. This mask protected the wearer from inhalation of minute particle of dust and prevents physical health hazards such as respiratory problem and skin irritation. All respondents said hood mask was highly suitable. Respondents said that hood mask was very suitable and cover entire face, head, and fabric properties also good.

Pleated mask : Data revealed that 1.86 overall WMS obtained in design assessment, 2.5 in comfort assessment, 2.58 secured in case of fabric, 2.3 found in durability/serviceability,1.3 obtained in case of adoption feasibility. That means respondents reported that two garment feature's are highly suitable, two aspects was found suitable and one aspect was somewhat suitable.

Beak mask: Data pertained from Table 4 that beak mask overall assessment was 2.1 (suitable), comfort assessment and fabric feature scored overall WMS 2.76 (highly suitable), durability/ serviceability all got 1.3 (somewhat suitable) overall WMS, all respondents said that they were not agreed to adopt this mask because it also didn't cover entire face and head and did not fit the face properly, it will not be useful for them for long time.

Triangular mask: It is clear from Table 4 that triangular mask was found highly suitable in all aspects by Dal mill workers. Respondents reported that it was easy to wear and easy to remove, easy to maintain, good absorbance quality of the fabric used and is more comfortable. That why triangular mask overall WMS was 2.61 (highly suitable), comfort assessment 2.83 and fabric feature scored overall WMS 2.88 (highly suitable), durability/ serviceability and adoption feasibility all got 3(highly suitable) and 2.3 (suitable) overall WMS respectively.

Knitted mask: It is depict from Table 4 that design assessment got 1.97 (suitable) overall WMS. Comfort assessment, 1.53 (somewhat suitable) and fabric obtained overall WMS 1.62(suitable), durability/ serviceability secured 2 (suitable) and last adoption feasibility secured 1 (somewhat suitable). Its scores were very low because it was much fitted to whole

Table 4: Assessments of different types of mask

S.No.	Functional features Mask	Hood Mask	Pleated mask	Beak Mask	Triangular mask	Knitted mask
1.	**Design assessment**					
	a. Overall Appearance	2.2	2.3	1.75	2.6	2.3
	b. Drapes well when used	1.7	1.5	2.3	3	2.12
	c. Covers entire head	2.3	1.8	2.25	2.25	1.5
2.	**Comfort assessment**					
	a. Easy to wear	2.6	2.6	3	3	1.12
	b. Easy to remove	2.8	2.75	3	2.5	1.37
	c. Breathable during working	2.1	2.2	2.3	3	2.12
3.	**Fabric**					
	a. Texture	2.6	2.5	3	3	3
	b. Thickness	2.3	2.3	2.6	3	1.5
	c. Softness/Stiffness	2.5	2.6	2.6	3	2.3
	d. Breathable	2.3	2.8	2.8	3	1.25
	e. Protects from dust	2.6	2.5	2.7	2.75	1.25
	f. Absorbency of perspiration	2.5	2.8	2.5	2.6	91.1
4.	**Durability**	2.6	2.3	1.37	3	2
5.	**Adoption feasibility**	2.1	1.6	1.3	2.3	2.3

Table 5: Comparison between different types of Mask

S.No.	Functional feature of Masks	(Overall WMS) of different types of masks				
		Hood mask	**Triangular mask**	**Knitted mask**	**Pleated mask**	**Beak mask**
1.	Design assessment	2.8	2.61	1.97	1.86	2.1
2.	Comfort assessment	2.5	2.83	1.53	2.5	2.76
3.	Fabric	2.46	2.88	1.62	2.58	2.7
4.	Suitability	2.6	3.0	2.0	2.3	1.3
5.	Adoption feasibility	2.1	2.3	2.3	1.6	1.3
	Aggregate WMS	2.49	2.72	1.88	2.16	2.03

Highly suitable: 2.34-3.00**,** Suitable: 1.67-2.33, somewhat suitable1.00-1.66

face and wearer responded that they couldn't breathe comfortably. Fabric used is very thick and reported they need slightly bigger size of mask.

Comparison between different types of Mask : Comparison between of hood mask, triangular mask knitted fabric mask, beak mask and pleated mask (Table 5), all five aspects are given by Dal mill worker (highly suitable, suitable and somewhat suitable).Overall appearance was high in triangular mask comparisons to hood mask, beak pleated and knitted fabric mask. But in hood mask are less features compare to triangular in all appearance aspects. In comfort assessment case triangular mask are highly compare to hood, pleated, knitted fabric and beak. Fabric properties were found highly suitable in case of triangular, hood, pleated and beak but knitted fabric mask was found in little tight, and durability/ serviceability was found highly suitable in hood and triangular but knitted fabric and pleated mask obtained WMS 2 and 2.3 respectively and beak mask 1.3 somewhat suitable. Adoption feasibility got 2.3 and 2.1 (highly suitable) and beak, pleated and knitted had scored1.3, 1.6 and 1 (somewhat suitable) as respectively. In all triangular masks was highly accepted by the Dal mill workers as compare to others masks

Assessment of ear muffs: Data in Table 6 indicate that ear muff assessment aspects got highly suitable overall WMS, design assessment secured 2.69, in case of comfort assessment got 2.83, in case of fabric also scored 2.76, durability secured 2.87 and lastly adoption feasibility secured also 2.6. Respondents said that readymade ear muff easily to wear and remove comfortable and to protect ear from noise.

Table 6: Suitability assessment of readymade ear muffs by Dal workers

S.No.	Functional features ear Muff	WMS
1.	**Design assessment**	
	a. Overall Appearance	2.87
	b. Drapes well when used	2.6
	c. Covers inner part of the ear	2.6
2.	**Comfort assessment**	
	a. Easy to wear	3
	b. Easy to remove	3
	c. comfortable during working	2.5
3.	**Fabric**	
	a. Texture	3
	b. Thickness	3
	c. Softness/Stiffness	2.3
	d. Comfortable	3
	e. Protects ear from noise	2.5
4.	**Durability/ Serviceability**	**2.87**
5.	**Adoption feasibility**	**2.6**

Assessments of hand gloves:- Three types of gloves Knitted gloves, Hosiery fabric gloves, Jeans fabric gloves were given for wear trials . Mean of scores obtained by all types of gloves in Table 7.

Table 7: Suitability assessment of knitted gloves by Dal mill workers

S.No.	Functional feature of gloves		WMS	Overall WMS
1.	**Design assessment**			
	a.	Overall look/ Appearance	2.5	2.2
	b.	Size assortment		
		Length of gloves	2.25	
		Width of gloves	2.1	
	c.	Fit/grip		
		Fitting at wrist	2.2	
		Fitting at fingers	1.8	
	d.	Covers entire palm	2.1	
2.	**Comfort assessment**			
	a.	Easy to wear	2.2	2
	b.	Easy to remove	2.5	
	c.	Grip while working	1.3	
3.	**Fabric**			
	a.	Texture	2.3	2.3
	b.	Thickness	1.6	
	c.	Softness/Stiffness	2.3	
	d.	Breathable	2.75	
	e.	Protects palm /hand	2.3	
	f.	Absorbency of perspiration	2.8	
4.	**Durability or serviceability**			
	a.	Durable for three months	2.6	1.18
	b.	Durable for more than three months	1.25	
	c.	Easily serviceable	2.1	

While evaluating the responses about the knitted gloves respondents reported that these types of gloves are suitable for their work. In design aspect overall WMS was reported 2.2 (suitable), comfort assessment got 2 (Suitable), fabric secured 2.3(Suitable), durability or serviceability reported 1.18 (somewhat suitable) and adoption feasibility secured 1.25 (somewhat suitable) overall WMS. So overall WMS good results were found in case of knitted gloves. Knitted gloves fitted properly in hand and palm and fingers. All respondents said knitted gloves features were suitable but work efficiency decreases as respondents were not used to wear gloves and work.

CONCLUSION

On the basis of result found, maximum comfort and functional features of developed functional clothing were found highly suitable or suitable. Adoption is not in highly agreed responses due to ignorance and lack of awareness among Dal mill workers. They are ignorant of problems and diseases that may occur due to short term and long term exposure to Dal grinding powder dust and its disposition in lungs and respiratory tract and various machines' noises also affect the health. Hence, the need arises to generate the awareness among the workers about the importance functional clothing.

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IMPACT OF NATIONAL FOOD SECURITY MISSION WITH SPECIAL REFERENCE TO ADOPTION OF GRAM SEED MINIKITS IN SOUTHERN RAJASTHAN

Ram Lal Khatik*, Dr. F.L. Sharma and Dr. H.K. Jain*****

ABSTRACT

The present investigation was conducted in Banswara and Udaipur districts of southern Rajasthan. Total 120 gram beneficiary and non- beneficiary farmers were selected on the basis of random sampling method from the identified districts. The findings revealed that 32.50 per cent of the total gram respondents were in the medium level of adoption group, whereas, 40.00 per cent respondents were in high level of adoption group and remaining 27.50 per cent gram growers to be observed in the low level of adoption about recommended gram interventions.

INTRODUCTION

National Food Security Mission is being run at present in all 13, 33 and 12 districts of Rajasthan under the component of wheat, pulses and course cereals respectively. In Rajasthan, rice is not covered under this programme. The emphasis in component third on NFSM- pulse reflects that several million people in the country remain largely bypassed by the green revolution and modern agricultural practices. The component NFSM- pulse is being implemented in Udaipur, Dungarpur and Banswara districts of southern Rajasthan since 2010. These districts are comes under Tribal- Sub-Plan area and also represent the nearly 45 per cent tribal population of the state. The mission is in full swing and so far no impact study in the operational area of the mission has been conducted regarding the response of farmers about gram interventions introduced under NFSM. This is the right time to assess the impact of the mission with regards to interventions introduced in gram cultivation. With this background in view, the present study entitled "Impact of National Food Security Mission with Special Reference to Adoption of Gram Seed Minikits in Southern Rajasthan" was undertaken with the following specific objectives:

1. To find out the level of adoption of recommended gram seed minikits interventions among the respondents.
2. To find out the extent of adoption of Gram seed minikits by the respondents.

RESEARCH METHODOLOGY

The present study was conducted in Banswara and Udaipur districts of southern Rajasthan. Two panchayat samities from each identified district were selected on the basis of maximum number of farmers are benefited through pulse interventions introduced under NFSM. For selection of villages, four villages where interventions related to gram are introduced were selected from each identified panchayat samiti on the basis of maximum farmers were benefitted under this mission. Thus, in all 16 villages were selected from all the identified panchayat samities for present investigation. These villages were termed as beneficiary villages. To know the impact of National Food Security Mission, a control group of 8 villages were selected from all the identified panchayat samities and these villages were considered as non-beneficiaries villages. For selection of beneficiary respondents, 5 gram growers were selected randomly from each identified village. Thus, in all 120 respondents (80 beneficiary farmers and 40 non- beneficiary farmers) were included in the sample of study. Data were collected by personal interview technique with the help of schedule.

RESULTS AND DISCUSSION

Efforts are being made under NFSM to boost the adoption of interventions in gram cultivation in the area of investigation. Nevertheless, there may exist gap between the interventions advocated and are

*Ph.D. Scholar, Department of Extension Education, Rajasthan college of Agriculture, Udaipur (Rajasthan).
** Professor & Head, Department of Extension Education, RCA Udaipur (Rajasthan).
*** Professor & Head, Department of Agricultural statistics & Computer Application, RCA Udaipur (Rajasthan).

adopted by the beneficiaries. Looking to the importance of seed minikits intervention in gram cultivation, the extent of adoption of seed minikits was measured and results are depicted in subsequent tables:

1. Distribution of respondents according to adoption of gram seed minikits: To get an overview of adoption level, the respondents were divided into three categories viz., low level of adoption (<19.21), medium level of adoption (19.21 to 26.85) and high level of adoption (>26.85). The groups were based on the calculated mean and standard deviation of the adoption scores obtained by the respondents. The results of the same are presented in Table 1.

Table 1 depicts that 32.50 per cent of the total respondents were in the medium level of adoption group, whereas, 40.00 per cent respondents were in high level of adoption group and remaining 27.50 per cent gram growers to be observed in the low level of adoption about recommended gram interventions.

Further, among the categories of gram growers, it was observed that 28.75 per cent beneficiary farmers and 40.00 per cent non-beneficiary farmers were in medium level of adoption category. Whereas, 23.75 per cent beneficiary farmers and 35.00 per cent non-beneficiary farmers were noted in the low level of adoption category. Likewise, 47.50 per cent and 25.00 per cent beneficiary and non-beneficiary farmers possessed high level of adoption respectively about recommended gram interventions. Thus, from the above results it can be concluded that beneficiary gram growers had more adoption about recommended gram interventions than non- beneficiary gram growers in the study area. The similar findings are reported by Sarada and Kumar (2013) concluded that more than fifty per cent of beneficiary chickpea farmers had medium level of adoption with respect to Integrated Pest Management practices, followed by 36.00 per cent of beneficiary farmers under high category. Whereas 48.00 per cent of the non-beneficiary farmers were in low adoption category.

2. Aspects-wise Adoption of gram seed minikits by the respondents: Individual aspect-wise extent of adoption of recommended seed minikits was worked out. For this mean per cent score were calculated. The results of the same have been presented in Table 2.

Table 2 indicates that the extent of adoption of minikit seed namely RSG-888 and Pratap chana-1 variety of gram among beneficiary farmers was recorded 85.00 and 84.38 per cent respectively, while in case of non-beneficiary farmers it was 57.50 and 60.75 per cent respectively. The extent of adoption of recommended sowing time of RSG-888 variety was 76.88 per cent for beneficiary and 58.75 per cent for non-beneficiary farmers. While, in case of sowing time of Pratap chana-1 variety of gram, it was observed that 78.13 and 60.00 per cent extent of adoption among beneficiary and non-beneficiary farmers respectively. It was ranked sixth and fifth by beneficiary and non-beneficiary farmers respectively.

Further analysis of Table 2 shows that the extent of adoption regarding recommended seed rate of RSG-888 and Pratap chana-1 variety of gram among beneficiary and non-beneficiary farmers was 79.38 and 52.50 per cent and 73.75 and 56.25 per cent respectively. It was noted that more than seventy per cent beneficiary respondents were adopting

Table 1: Distribution of respondents according to their level of adoption about gram interventions

n=120

S. No.	Adoption Level	Beneficiary farmers		Non-beneficiary farmers		Total	
		f	%	f	%	f	%
1.	Low (<19.21)	19	23.75	14	35.00	33	27.50
2.	Medium (19.21- 26.85)	23	28.75	16	40.00	39	32.50
3.	High (>26.85)	38	47.50	10	25.00	48	40.00
	Total	**80**	**100.00**	**40**	**100.00**	**120**	**100.00**

f = Frequency, % = per cent

Table 2: Extent of adoption of seed minikits by the respondents in gram cultivation

n =120

S.No.	Aspects	Beneficiary farmers		Non-beneficiary farmers		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Adoption of RSG-888 variety of gram	85.00	1	57.50	8	75.83	3
2.	Adoption of pratap-chana-1 variety of gram	84.38	2	60.75	4	76.50	1
3.	Recommended sowing time of RSG-888	76.88	7	58.75	6	70.83	6
4.	Recommended seed rate of RSG-888	79.38	4	52.50	10	70.42	7
5.	Recommended spacing of RSG-888	78.75	5	63.75	2	73.75	4
6.	Recommended depth of sowing of RSG-888	81.88	3	65.00	1	76.25	2
7.	Recommended sowing time of Pratap chana-1	78.13	6	60.00	5	72.08	5
8.	Appropriate seed rate of Pratap chana-1	73.75	9	56.25	9	67.92	10
9.	Recommended spacing of Pratap chana-1	71.88	10	61.25	3	68.33	9
10.	Recommended depth of sowing of Pratap chana-1	76.25	8	58.25	7	70.40	8

MPS=Mean per cent score

recommended row to row spacing for RSG-888 and Pratap chana-1 variety of gram crop. While, in case of non-beneficiary farmers it was around sixty per cent. Regarding adoption of recommended depth of sowing of RSG-888 and Pratap chana-1 variety of gram, it was found that beneficiary and non-beneficiary farmers had 81.88 and 65.00 per cent and 76.25 and 58.25 per cent extent of adoption respectively in the study area.

The present findings are in accordance with the findings of Patel and Tanwar (2004) and Samota (2011).

CONCLUSION

Form above discussion, it can be concluded that the most of the beneficiary farmers possessed more adoption than non-beneficiary farmers in all aspects of RSG-888 and Pratap chana-1 variety of gram crop. It can be further concluded that the range of extent of adoption in beneficiary farmers was 71.88 to 85.00 per cent, while in case of non-beneficiary farmers the range of extent of adoption was 52.50 to 65.00 per cent in all aspects about seed minikits of gram crop. To improve the extent of adoption in both the categories of farmers, intensive training programmes should be organized timely and should be location specific for the study area.

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ANALYSIS THE FUNCTIONAL CHARACTERISTICS OF SELF HELP GROUPS IN PALI DISTRICT OF RAJASTHAN

Aishwarya Dudi* and M.L.Meena**

ABSTRACT

The present study examines the functional characteristics of rural women in self help groups in Pali district of Rajasthan by interviewing 150 rural women from 30 self help groups. It is revealed that majority of the groups scored low on group processes, high group sustainability and high confirmation to group norms. Maximum number of groups was found to be discussing only issues related to thrift, economic activities and personal problems and most of the self help groups were formed for achieving life security by saving for future. The study suggests qualitative improvement required for the functioning of the SHGs.

INTRODUCTION

The Self Help Groups (SHGs) are viable alternative in achieving the objectives of women empowerment. Individually, poor women tend to be erratic and uncertain in her behavior. Group membership smoothes such rough edges making her more reliable. Participation of women in SHGs makes a significant impact on their empowerment, both in social and economic terms. It helps to bring about awareness among rural women about savings, education, health, environment, cleanliness family welfare etc. and makes themes self-reliant. Women constitute half of the world's population, contribute about two-thirds of its working hours, receive one-tenth of the world's income and own less than one-hundred of the world's property. They share abundant responsibility and perform a wide spectrum of duties. The existence of women in a state of economic, political, social and knowledge disempowerment is known to be a major hindrance to economic development.

The self help group is an alternative approach to achieve the objectives of the rural development. SHG is a viable organized setup to disburse micro-credit to the rural women and encouraging them to enter into entrepreneurial activities. Formation of Self Help Groups (SHGs) has greatly helped rural women to understand their rights, access to information, economic independence, freedom of expression, confidence building, access to credit, improve their personality and respect in the society etc. Self help group is an approach through which efforts are being made by the government and non-government organizations with an intention to pool both human and material resources to empower women in rural areas. The empowerment of rural women through SHGs would lead to benefit not only the individual women and women groups but also the family and community as a whole through collective action and solidarity. Cohesion enables the members of the group to perceive common interests and act collectively. In recent years, SHGs are emerging as an important alternative mechanism to meet the urgent credit needs of poor through thrift. Group cohesiveness, group sustainability, cooperation among group members and confirmation to group norms are the factors mostly affecting the functioning of the groups in getting good profits. The present study analyzed the functional characteristics of SHGs in terms of group processes, group sustainability, conformity to group norms, critical issues of group meetings and motivation for forming into SHGs.

RESEARCH METHODOLOGY

The present study was conducted in Pali district of Rajasthan. Five villages Hemawas, Sonaimanjhi, Roopawas, Gadwara and Kharda were selected purposely as they were having highest number of SHGs. Totally 30 SHGs were selected by using proportionate random sampling method from selected villages. From each selected SHG, five women were drawn randomly to represent the group. Thus, finally, there were 150 rural women respondents for the study. Five functional characteristics viz., group process,

*SMS (Home Science), CAZRI, Krishi Vigyan Kendra, Pali-Marwar (Rajasthan)-306401.
**SMS (Agricultural Extension), CAZRI, Krishi Vigyan Kendra, Pali-Marwar (Rajasthan)-306401.

group sustainability, conformity to norms, critical issues of group meetings and motivation for forming into SHG groups were analyzed. Data was collected by personal interview method by using pre-tested schedule developed for the study.

RESULTS AND DISCUSSION

Group processes: Response analysis of group processes viz., group cohesiveness, group role differentiation, group leadership and group communication is presented in Table 1

A. Group cohesiveness: Table 1 reveals that Majority (90.09 %) of the groups members were satisfied with the group functioning and comfortable to work with other members. Further, 83.34 per cent groups expressed that members rely on one another in the group and there is a healthy competition among group members. Majority of (80.00%) group members encourage each other, 76.67 per cent groups worked well and 70.00 per cent groups felt that their group manages conflicts /disagreements effectively. Hence, this situation needs to be maintained by every group leader to the leader by motivating their group members to work untidy for higher benefits through SHGs. The findings confirm with the findings of Singh, *et al*. (2010).

B. Group role differentiation: Most (93.33%) of the groups expressed that members are equally consulted for the development of the group and group members have inclination to take up allotted work and 70.00 per cent groups indicated that the work of the group is well divided among all the members and have equal in the decision making process of the group. Further, 63.33 per cent groups said true for all the members actively participate in the activities of the group and some what true for group leader solely responsible for majority of tasks. It is very clear from the above figures that they are following democratic approach and equal importance is being given to all members. It is a good sign for better functioning of the group as a whole. The findings confirm with the findings of Mehra, *et al*. (2010) and Muthuramu, *et al*. (2015).

C. Group leadership: A great majority of groups indicated that group organizer works much for group success (90.00%), group organizer have good relations with other leaders and groups (83.34%) and group organizer is approachable and dependable (80%). Further, 70.00 per cent group gave response of somewhat true for the statement group organizer has no control on the group members and 66.70 per cent groups felt that the group organizer is sympathetic and helpful in solving others problems at work or in their personal life. Hence, further to strengthen the leadership abilities they need to be selected by using right methods and trained to work as an effective leader. The findings confirm with the findings of Muthuramu, *et al*. (2015), Bhatnagar and Rathore (2015) and Saidanna and Sailaja (2010).

D. Group communication: Almost 90.00 per cent group members expressed that the group members are kept informed about important events, 80.00 per cent groups indicated that the members dependency on informal leader for information was somewhat true. Nearly eighty per cent groups felt that members discuss about their personal problems with others in group, 70 per cent groups informed that friendly and informal interactions occur in the group and 50 per cent groups said that the information flows easily from one clique to another clique in the group. It was mainly due to the homogeneity in terms of castes, location and their interests. The findings confirm with the findings of Kumar, *et al*. (2008).

Group sustainability of SHGs: Majority (70.00%) groups were having active life groups and high internal lending, 63.33 were having low recoupment of revolving fund and 56.67 per cent were having high extent of defaulters and low status of group savings. The overall picture of group sustainability and it was mainly because group members realized that group profits are their own profits. The findings confirm with the findings of Mishra (2005).

Confirmation to group norms by SHGs: Table 3 evident that majority of the groups always confirmed to meet as scheduled at fixed places and group work (90.00%), maintaining books and records (91.60%) and repaying loan promptly (66.67%). Further, 66.67 per cent of groups rarely confirmed to levy penalty on members realization about the confirmation to group norms for smooth functioning of the group, 63.33 per cent groups prioritized the needs of members for utilization of thrift and 56.67 per cent

Table 1: Response analysis of statements of group processes of self help groups

(Numbers of groups=30)

S.No.	Components of group process	True F (%)	Somewhat true F(%)	Not true F (%)
A. Group cohesiveness				
1.	I feel this group worked well tighter	23 (76.67)	7 (23.33)	-
2.	The group manages conflicts/disagreements effectively	21 (70.00)	7 (23.33)	2 (6.67)
3.	There is unhealthy competition and criticism among group members	1 (3.33)	4 (13.33)	25 (83.34)
4.	Member do not encourage/support each other in the group	-	6 (20.00)	24 (80.00)
5.	I feel dissatisfied and would like to quit the group	-	3 (10.00)	27 (90.00)
6.	I do not feel comfortable to work with same group members for other activities	-	3 (10.00)	27 (90.00)
7.	Members do not rely one another in the group	-	5 (16.66)	25 (83.34)
B. Group role differentiation				
1.	The work of the group is well divided among all the members	21 (70.00)	9 (30.00)	-
2.	All the members have equal say in the decision making process of the group	21 (70.00)	9 (30.00)	-
3.	All the members actively participate in the activities of the group	19 (63.33)	11 (36.67)	-
4.	Members are not equally consulted for the development of the group	2 (6.67)	-	28 (93.33)
5.	Group leader solely responsible for majority of tasks	2 (6.67)	19 (63.33)	9 (30.00)
6.	Group members lack inclination to take up allotted work/ responsibility	-	2 (6.67)	28 (93.33)
C. Group leadership				
1.	Group organizer is sympathetic and helpful in solving other's problem at work or in their personal life	20 (66.67)	10 (33.33)	-
2.	Group organizer is efficient at group work	13 (43.33)	17 (56.67)	-
3.	Group organizers has control on group and individual members	9 (30.00)	21 (70.00)	-
4.	Group organizer do not have good relationships with other leaders and groups in the community	2 (6.67)	3 (10.00)	25 (83.34)
5.	Group organizer do not work much for group's success	-	3 (10.00)	27 (90.00)
6.	Group organizer is less approachable and undependable	-	6 (20.00)	24 (80.00)
D. Group communication				
1.	Members discuss about their personal problems with other members in the group	23 (76.67)	7 (23.33)	-
2.	Informal and friendly interactions occurs in the group	21 (70.00)	8 (26.67)	1 (3.33)
3.	The information flows easily from one clique to another clique in the group	15 (50.00)	12 (40.00)	3 (10.00)
4.	Group members depend on information leader for getting information	6 (20.00)	24 (80.00)	-
5.	The group members are not kept informed about important events or activities	1 (3.33)	2 (6.67)	27 (90.00)

Table 2 Group sustainability SHGs

(Numbers of groups=30)

S.No.	Components of group processes	Frequency	Percentage
1.	**Active life of the group**		
	Low active life groups	9	30.00
	High active life groups	21	70.00
2.	**Level of internal lending**		
	Low internal lending groups	9	30.00
	High internal lending groups	21	70.00
3.	**Extent of defaulters in group**		
	Low defaulter groups	17	56.67
	High defaulter groups	13	43.33
4.	**Status of group savings**		
	Low group savings	17	56.67
	High group savings	13	43.33
5.	**Recoupment of revolving fund**		
	Low recoupment of revolving fund	19	63.33
	High recoupment of revolving fund	11	36.67

Table 3: Response analysis of statements of confirmation of group norms of SHGs

(Numbers of groups=30)

S.No.	Components of group processes	Always F (%)	Sometimes F (%)	Rarely F(%)
1.	The group meets as scheduled at fixed place of meetings and group work	28 (93.33)	2 (6.67)	-
2.	The group maintains required books and records	27 (90.00)	2 (6.67)	1 (3.33)
3.	Group members repay loan promptly	20 (66.67)	10 (33.33)	-
4.	The needs of members are prioritized for utilization of thrift	19 (63.33)	10 (33.33)	1 (3.33)
5.	All the members compulsorily attend the meetings	17 (56.67)	12 (40.00)	1 (3.33)
6.	Group members promptly remit the thrift	15 (50.00)	15 (50.00)	-
7.	Penalty is levied on members for late repayment defaulting	5 (16.66)	5 (16.66)	20 (66.67)

Table 4 Distribution of SHGs according to the critical issues discussed in group meetings

(Numbers of groups=30)

S. No	Critical issues of group meetings	F	%
1.	Only thrift and other financial aspects	-	-
2.	Thrift activities+ economic activities	2	6.67
3.	Thrift activities+ economic activities+ personal problems	11	36.67
4.	Thrift activities+ economic activities+ personal problems+ community problems	8	26.67
5.	All the above+ general welfare and solutions for problems of women	10	33.33

Table 5 Distribution of SHGs according to the motive to form SHGs

(Numbers of groups=30)

S. No.	Reasons	Frequency	Percentage
1.	For future savings	28	93.33
2.	For getting loans at cheaper interests	21	70.00
3.	To become economically independent	17	56.67
4.	To overcome financial problems	15	50.00
5.	To solve the problems collectively	9	30.00
6.	For improving skills	8	26.67
7.	To avoid the conflicts among neighbours	3	10.00

groups compulsorily attend meetings. Half of the groups sometimes confirmed to promptly remitting the thrift. The findings confirm with the findings of Tyagi (2015), Meenma, *et al*. (2012) and Gupta and Rahman (2007).

Critical issues discussed in group meetings of SHGs: It could be noticed from Table 4 that 36.67 per cent of the groups discussed thrift activities, economic activities and personal problems. One third (33.33%) of groups discussed thrift activities, economic activities, personal problems, community problems and general welfare and solutions of women. Whereas, 26.67 per cent of groups discussed thrift activities, economic activities, personal problems and community problems and only a negligible per cent (6.67%) discussed only thrift activities and economic activities. It shows their concern about different related aspects for their welfare. The findings confirm with the findings of Khullar and Singh (2007).

Perceived motives for forming SHGs: Most (93.33%) of the groups were formed with a motive of future savings, 70 per cent for getting loans at cheaper interests, 56.67 per cent to become economically independent, 50.00 per cent with a motive to overcome financial problems, 30 per cent groups solve the problems collectively and 26.67 per cent groups were formed for improving group members' skills. The least motives for them to form groups were to avoid the conflicts among neighbours (10.00%). It is a clear evidence for the transformation in their attitudes and their concern about the future.

CONCLUSION

It may be concluded that the concerned agencies and development workers responsible for forming and promoting SHGs like women and child welfare department and non-government organizations has to emphasize and encourage the fruitful discussions of thrift, social and economic activities and different means of savings and investment which benefit not only the personality of women but also the overall development of the society. This kind of inculcating such factors among the group members may be through training programmes, discussion with successful group members at other villages and awareness camps.

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CONSTRAINTS PERCEIVED BY THE RKVY BENEFICIARIES IN ADOPTION OF RECOMMENDED WHEAT AND MAIZE INTERVENTIONS

Sunita Kumari* and F.L. Sharma**

ABSTRACT

The present study was conducted in two tribal (Jhadol and Sarada) and two non-tribal (Bhinder and Mavli) panchayat samities of Udaipur district of Rajasthan. Four beneficiary villages and two non-beneficiary villages from each selected panchayat samiti were taken and 10 respondents were selected randomly from each selected village for the study. Data were collected through pre-structured interview schedule. The findings revealed that among the five constraints category, constraints related to plant protection equipments was the major constraints perceived by the wheat and maize growers.

INTRODUCTION

The GDP of agriculture increased annually at more than 3 per cent during 1980s. Since, Ninth Five-Year Plan (1996 to 2001-02), India has been targeting a growth rate of more than 4 per cent in agriculture but the actual achievement has been much below the target. More than 50 per cent of the work force of the country still depends upon agriculture for their livelihood and presently the growth rate is 3.5 per cent in 2012. Slow growth in agriculture and allied sectors can lead to acute stress in the economy because the population dependent upon this sector is still very large. A major cause behind the slow growth in agriculture is the consistent decrease in investments in this sector by the state governments, while public and private investments are increasing manifold in sectors such as infrastructure, industry etc. but investments are not forthcoming in agriculture and allied sectors, leading to distress in the community of farmers, especially that of the small and marginal segment. Hence, the need for incentivizing states to increase their investments in the agriculture and allied sectors has been felt.

Concerned by the slow growth in the agriculture and allied sectors, the National Development Council (NDC), in its meeting held on 29th May, 2007, resolved that a special additional central assistance scheme namely Rastriya Krishi Vikas Yojana (RKVY) be launched. The RKVY aims at achieving 5.5% annual growth in the agriculture sector during 12th plan period by ensuring a holistic development of agriculture and allied sectors.

RESEARCH METHODOLOGY

The paper presents the data gathered in a rendomly selected sample of the beneficiary farmers towards recommended interventions of wheat and maize crop introduced under RKVY programme in two tribal (Jhadol and Sarada) and two non-tribal (Bhinder and Mavli) panchayat samities of Udaipur district of Rajasthan. Total 160 beneficiary farmers were selected for the study. To find out the constraints that hinder the adoption of wheat and maize crop practices, a suitable schedule was developed particularly for the present study. The responses obtained from respondents were recorded on three point continuum scale viz., 'most severe', 'less severe' and 'not severe' which were assigned scores 3, 2 and 1 respectively. Total score obtained by each respondent as well as for each statement was calculated. The respondents were divided into three categories (Most severe, severe, and less severe) on the basis of mean and standard deviation.

Frequency and percentage of respondents in each category were calculated. Further, to determine the intensity of constraints, mean percent score for each item was worked out and ranked accordingly.

*Research Scholar, Department of Extension Education, Rajasthan College of Agriculture, MPUAT, Udaipur (Raj.).
**Professor, Department of Extension Education, Rajasthan College of Agriculture, MPUAT, Udaipur (Raj.).

RESULTS AND DISCUSSION

(a) Distribution of beneficiary respondents according to their level of constraints faced by them in adoption of recommended wheat and maize interventions: To get an overview of the level of constraints, the respondents were identified into three strata i.e. low (Upto 83.84), medium (83.84 to 108.98) and high (Above 108.98) level of constraints. These categories were formed on the basis of calculated mean and standard deviation of the scores given to the constraints by the respondents. The results of the same have been given in Table 1.

Table 1: Distribution of beneficiary respondents according to their level of constraints in adoption of wheat and maize interventions

n =160

S. No.	Category	Tribal Area		Non-tribal Area		Total	
		f	%	f	%	f	%
1.	Low(< 83.84)	9	11.25	13	16.25	22	13.75
2.	Medium (83.84 to 108.98)	54	67.5	44	55	98	61.25
3	High(> 108.98)	17	21.25	23	28.75	40	25.00
	Total	**80**	**100**	**80**	**100**	**160**	**100**

f = frequency, % = per cent

The data incorporated in Table 1 reveal that 61.25 per cent (54 tribal area's & 44 non-tribal area's respondents) beneficiary respondents faced medium level of constraints in adoption of recommended wheat and maize interventions. Whereas, 25.00 per cent (17 tribal area's & 23 non-tribal area's respondents) beneficiaries were observed to be in high constraints group and only 13.75 per cent (9 tribal area's & 13 non-tribal area's respondents) beneficiary respondents perceived low level of constraints in recommended wheat and maize interventions.

From the above results, it can be concluded that majority of beneficiary respondents had either medium or high level of constraints in adoption of wheat and maize interventions.The present findings are supported by the findings of Kumar (2008).

(b) Intervention wise constraints faced by wheat and maize growers: The Rastriya Krishi Vikash Yojana has a focused approach. Therefore, the important interventions of wheat and maize namely seed minikits, field demonstrations, farm mechanization, micro-nutrients and plant protection equipments were introduced under the RKVY. An effort was made to find out the priority of constraints perceived by the respondents in adoption of recommended wheat and maize interventions introduced under Rastriya Krishi Vikash Yojana. The intervention-wise results have been presented in subsequent tables.

(i) Constraints faced by the respondents about adoption of seed minikits of wheat and maize crop: The data presented in Table 2 reveals that "high requirement of manure and fertilizers for HYV/ Hybrid varieties" was expressed as most important constraint by the beneficiary respondents with MPS 77.50 and it was ranked first in the priority of the constraints. The next important constraint perceived by the beneficiary respondents was "timely unavailability of seed minikits at local level" with the extent of MPS 75.83. Likewise, the constraint related to "lack of knowledge about advantages of seed minikits" was also expressed as major constraint by the beneficiary wheat and maize growers. The mean percent score of this constraint was 74.79 and ranked third in the problems hierarchy.

Further analysis of table shows that " susceptible to insect-pest and diseases," " shattering loses with over maturity ", " poor quality of seed minikits ", " less straw production of varieties of seed minikits ", "lack of knowledge about production and productivity of HYV/ Hybrid varieties " and " low market value of produce from seed minikits" were also important constraints faced by the beneficiary respondents in adoption of recommended wheat and maize interventions. The mean percent score of these constraints was 71.25, 69.16, 68.75, 67.29, 64.65 and 55.00 respectively.

The present findings are supported with the findings of Singh *et al*. (2007), Samota (2011).

(ii) Constraints faced by the beneficiary respondents regarding adoption of field demonstrations of wheat and maize crop: The data

Table 2: Constraints faced by the beneficiary respondents regarding to seed minikits of wheat and maize crop

n =160

S. No.	Category	Tribal Area		Non-tribal Area		Total	
		MPS	**R**	**MPS**	**R**	**MPS**	**R**
1	Timely unavailability of seed minikits at local level	70.83	VII	80.83	I	75.83	II
2	Lack of knowledge about production and productivity of HYV/ Hybrid varieties	59.16	VIII	73.75	III	64.65	VIII
3	Lack of knowledge about advantages of seed minikits	76.00	III	73.33	IV	74.66	III
4	High requirement of manure and fertilizers for HYV/ Hybrid varieties	80.83	I	74.16	II	77.50	I
5	Less straw production of varieties of seed minikits	73.75	VI	60.83	VI	67.29	VII
6	Low market value of produce from seed minikits	53.33	IX	56.66	IX	55.00	IX
7	Poor quality of seed minikits	77.50	II	60.00	VIII	68.75	VI
8	Susceptible to insect-pest and diseases	76.25	IV	66.25	VII	71.25	IV
9	Shattering loses with over maturity	66.25	V	72.08	V	69.16	V
	Total	**70.25**		**68.65**		**69.45**	

MPS =mean per cent score, R = rank

presented in Table 3 reveal that "timely non-availability of package of practices of demonstrated crop" was expressed as most important constraint by the beneficiary wheat and maize growers with MPS 80.41 with ranked first and in the priority of the constraints. The field demonstration constraint "Lack of information about proper quantity of thio-urea per hectare" was also perceived priority constraints by the beneficiary respondents with 78.87 MPS and ranked second in the hierarchy of constraints. The next important constraint perceived by the beneficiary respondents was "lack of experience of extension workers in conducting demonstration" with the extent of MPS 76.45. Likewise, the constraint related to "lack of knowledge about profit of field demonstrations" was also expressed as major constraint by the beneficiary farmers. The mean percent score of this constraint was 76.25 and ranked fourth in the problems hierarchy.

Further analysis of table shows that "lack of knowledge about application of thio-urea," "lack of competence of AAOs/Agril. Supervisors in conducting the demonstrations", "adverse climatic conditions at critical stages of crop" and "poor communication facilities" were also important constraints faced by the beneficiary respondents in adoption of recommended interventions of wheat and maize in the study area. The mean percent score of these constraints was 75.83, 75.20, 72.08 and 71.87 respectively.

It was also found that "biased agricultural experts/ SMSs", "improper knowledge of field demonstrations" were also perceived as average constraints by the respondents with 71.66 and 70.41 MPS respectively. The least important constraint expressed by the respondents was "improved seeds are more susceptible to insect - pest and disease" with 64.41 MPS. This constraint was ranked eleventh in the ranking hierarchy of constraints perceived by the beneficiary respondents.The present findings are supported with the findings of Samota (2011).

(iii) Constraints faced by the beneficiary respondents regarding adoption of farm mechanization of wheat and maize crop: The data

Table 3: Constraints faced by the beneficiary respondents regarding to field demonstration of wheat and maize crop

n =160

S. No.	Constraints	Tribal Area		Non-tribal Area		Total	
		MPS	**R**	**MPS**	**R**	**MPS**	**R**
1	Improper knowledge of field demonstrations	69.16	X	71.66	VIII	70.41	X
2	Lack of knowledge about profit of field demonstrations	77.50	VIII	75.00	IV	76.25	IV
3	Biased agricultural experts/SMSs	67.50	XI	75.83	II	71.66	IX
4	Poor communication facilities	80.41	III	63.33	X	71.87	VIII
5	Adverse climatic conditions at critical stages of crop	80.00	IV	64.16	IX	72.08	VII
6	Improved seed are more susceptible to insect - pest and disease	78.00	VII	50.83	XI	64.41	XI
7	Timely unavailability of package of practices of demonstrated crop	80.83	II	80.00	I	80.41	I
8	Lack of knowledge about application of thio-urea	78.33	VI	73.33	VI	75.83	V
9	Lack of information about proper quantity of thio-urea per hectare	85.41	I	72.33	VII	78.87	II
10	Lack of competence of AAOs/Agril. Supervisors in conducting the demonstrations	75.00	IX	75.41	III	75.20	VI
11	Lack of experience of extension workers in conducting demonstrations	78.75	V	74.17	V	76.45	III
	Total	**77.38**		**70.55**		**73.96**	

MPS =mean per cent score, R = rank

presented in Table 4 reveal that "lack of knowledge about use of farm implements" was expressed as most important constraint by the beneficiary respondents with MPS 83.54 and it was ranked first in the priority of the constraints. The next important constraint perceived by the beneficiary respondents was "high cost of farm implements" with the extent of MPS 82.08. Likewise, the constraint related to "non-availability farm machinery at local level" was also expressed as major constraint by the beneficiary tribal and non-tribal area's respondents. The mean percent score of this constraint was 81.87 and ranked third in the problems hierarchy.

Further analysis of table shows that "non-availability of machinery loan to farmers at appropriate time", "expenditures on implements are high", "lack of handling of implements" and "lack of skill about use of farm machinery", were also important constraints faced by the beneficiary tribal and non-tribal area's respondents in adoption of recommended interventions of wheat and maize. The mean percent score of these constraints was 76.45, 75.00, 71.87 and 71.45 respectively.

The present findings are supported with the findings of Singh *et al*. (2007) and Samota (2011).

(iv) Constraints faced by the beneficiary respondents about adoption of micro-nutrients of wheat and maize crops: The data presented in Table 5 reveals that "no immediate effect on crop production" and "non-availability of micro nutrients at appropriate time" were expressed as priority constraints by the beneficiary respondents with MPS 76.25 and 70.83 and ranked first and second

Table 4: Constraints faced by the beneficiary respondents regarding to farm mechanization of wheat and maize crop

n =160

S. No.	Constraints	Tribal Area		Non-tribal Area		Total	
		MPS	**R**	**MPS**	**R**	**MPS**	**R**
1	High Cost of farm implements	83.75	III	80.41	I	82.08	II
2	Lack of knowledge about use of farm implements	87.50	II	79.58	II	83.54	I
3	Expenditures on implements are high	79.16	IV	70.83	VI	75.00	V
4	Lack of skill about use of farm machinery	65.00	VII	77.91	III	71.45	VII
5	Non-availability farm machinery at local level	91.25	I	72.50	V	81.87	III
6	Non-availability of machinery loan to farmers at appropriate time	78.33	V	74.58	IV	76.45	IV
7	Lack of handling of implements	76.25	VI	67.50	VII	71.87	VI
	Total	**80.18**		**74.76**		**77.46**	

MPS =mean per cent score, R = rank

respectively. The next important constraint perceived by the beneficiary respondents was "lack of micronutrients in soil" with the extent of MPS 70.62 and ranked third. Whereas, the constraint related to "high cost of micro-nutrients" was also expressed as major constraint by the beneficiary respondents. The mean percent score of this constraint was 68.75 and ranked fourth in the problems hierarchy.

Further analysis of table shows that "lack of knowledge about combination of micro-nutrient", "

Table 5: Constraints faced by the beneficiary respondents about adoption of micro-nutrient in wheat and maize crop

n =160

S. No.	Constraints	Tribal Area		Non-tribal Area		Total	
		MPS	**R**	**MPS**	**R**	**MPS**	**R**
1	High Cost of micro-nutrients	72.91	III	64.58	I	68.75	IV
2	Lack of knowledge about use of quantity of micro-nutrients	70.41	V	62.50	VII	66.45	VI
3	Lack of micro-nutrients in soil	75.00	I	66.25	V	70.62	III
4	Non-availability of micro nutrients at appropriate time	72.08	IV	69.58	IV	70.83	II
5	Lack of knowledge about combination of micro-nutrients	56.66	VII	76.66	II	66.66	V
6	Improper knowledge of micro-nutrients application	57.50	VI	70.00	III	63.75	VII
7	No immediate effect on crop production	73.33	II	79.16	I	76.25	I
	Total	**68.27**		**69.81**		**69.04**	

MPS = mean per cent score, R = rank

lack of knowledge about use of quantity of micro-nutrients" and "improper knowledge of micro-nutrients application" were also important constraints faced by the beneficiary respondents in adoption of micro-nutrients application in wheat and maize. The mean percent score of these constraints was 66.66, 66.45 and 63.75 respectively.

The present findings are supported with the findings of Samota (2011).

(v) Constraints faced by the beneficiary respondents to adoption of plant protection equipments of wheat and maize crop: The data presented in Table 6 reveals that "non-availability of plant protection equipments" was expressed as most important constraint by the beneficiary respondents with MPS 83.75 and ranked first by the respondents. Whereas, "lack of knowledge about operation of Knap Sack Hand Sprayer" was second important constraints faced by the respondents with MPS 81.20. This was followed by the constraint "lack of technical knowledge about plant protection equipments" with the extent of MPS 80.00 and ranked third by the respondents. Likewise, the constraint related to "non-availability of suitable equipments for seed treatment" was also expressed as major constraint by the beneficiary respondents. The mean percent score of these constraints was 78.54 and ranked fourth in the problems hierarchy.

Further analysis of table shows that "lack of knowledge about preparation of chemical solution", "lack of skill about use of duster", "high cost of plant protection equipments" were also important constraints faced by the beneficiary farmers in adoption of recommended plant protection equipments in wheat and maize cultivation. The mean percent score of these constraints was 78.33, 77.91 and 76.45 respectively.

It was also found that the less important constraints expressed by the beneficiary respondents were "timely unavailability of chemicals for use of

Table 6: Constraints faced by the beneficiary respondents regarding to adoption of plant protection equipment of wheat and maize crop

n =160

S. No.	Constraints	Tribal Area		Non-tribal Area		Total	
		MPS	**R**	**MPS**	**R**	**MPS**	**R**
1	Lack of technical knowledge about plant protection equipments	83.33	II	76.66	V	80.00	III
2	Lack of skill about use of duster	81.25	V	74.58	V I	77.91	VI
3	High cost of plant protection equipments	81.66	IV	71.25	VIII	76.45	VII
4	Non-availability of suitable equipments for seed treatment	78.33	VI	78.75	IV	78.54	IV
5	Timely unavailability of chemicals for use of plant protection equipments	77.91	VII	72.50	VII	75.20	VIII
6	Lack of knowledge about chemicals for plant protection	74.16	IX	62.91	X	68.54	X
7	Lack skill about use of Knap Sack Hand Sprayer	68.75	X	69.16	IX	68.95	IX
8	Lack of knowledge about preparation of chemical solution	77.08	VIII	79.58	III	78.33	V
9	Lack of knowledge about operation of Knap Sack Hand Sprayer	82.00	III	80.41	II	81.20	II
10	Non-availability of plant protection equipments	86.26	I	81.25	I	83.75	I
	Total	**79.07**		**74.70**		**76.90**	

MPS =mean per cent score, R = rank

plant protection equipments", "lack skill about use of Knap Sack Hand Sprayer" and "lack of knowledge about chemicals for plant protection" with 75.20, 68.95 and 68.54 MPS respectively. These constraints were ranked eighth, ninth and tenth in the ranking hierarchy of constraints perceived by the beneficiary farmers. The present findings are supported with the findings of Ranawat (2011)

CONCLUSION

Thus, from the above results, it may be concluded that 61.25 per cent beneficiary respondents faced medium level of constraints in adoption of recommended wheat and maize crop interventions. Whereas, 25.00 per cent wheat growers were observed to be in high constraints group and only 13.75 per cent respondents perceived low level of constraints in recommended wheat and maize crop interventions. It was found that among the five constraints category, constraints related to plant protection equipments was the major constraints perceived by the wheat and maize growers. This constraint was followed by constraints related to farm mechanization and field demonstrations, respectively. While the constraints perceived by them were micro-nutrients application and seed minikits were also important constraints expressed by the beneficiary farmers in the adoption of recommended wheat and maize interventions.

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EDUCATIONAL STATUS OF RURAL WOMEN IN HOUSEHOLD DECISION MAKING IN COOCH BEHAR DISTRICT OF WEST BENGAL

Dipak Kumar Bose*

ABSTRACT

The study was conducted to find out the association between educational status and participation of married women in different household activities. One hundred twenty rural women were selected randomly from purposively selected one block and twelve villages in Cooch Behar District of West Bengal. The data were collected by using pre-structure interview schedule. The study reveals that majority of the respondents were middle aged, literate, having medium income group. They belonged to nuclear family system and had agriculture as main occupation. It was found that majority of higher level of educated respondents had their consent of getting married, whereas no consent was made by illiterate respondents. In the same way 42 per cent higher level of education completed respondents had high level of purchasing power in comparison to primary (16%) and illiterate (0%) level of purchasing power of the respondents.

INTRODUCTION

Education is necessary for the survival of a nation. The concept education suggests development of valuable knowledge and skills in a society. Educational system of any society as an elaborate social mechanism designed to bring about the desirable changes in attitudes that are adjusted to be useful and desirable in the society. Women education has also been claimed to alter household power relations making women more autonomous and giving them greater control of various dimensions of their lives. Consequently, such greater control of their lives could be reflected in the independent decision making regarding different household activities.

In the modern age, the decision-making in the household activities and family affairs are done by all economically active family members in a democratic spirit. Several studies conducted in India and abroad suggested that in order to increase the role of farm woman in decision making for agricultural production, dairy and other allied activities of technical nature, it is necessary to equip them with latest information so that they can play a vital role in decision making in the family (Wasnik 2001). It has been found that house wives/farm women were consulted more on the agricultural activities which are mostly carried out and supervised by them (Shobha, 1987, Wasnik, 2006).

Women's decision-making power is related to their educational level and mobility. In the rural area the level of education is comparatively low and also rural women are not allowed to go outside alone or go to make household purchases are empower in decision-making. But it is a common scenario of today that women movement has locked in this patriarchal society because of having low educational status. Keeping in view of the above the present study was conducted to find out the relationship of the educational level and participation of rural women in house hold activities.

RESEARCH METHODOLOGY

The present investigation was conducted purposively selected Tufanganj-I & Tufanganj-II blocks of Cooch Behar district in 2016 covering 12 villages selected randomly. For the selection of respondents, a village wise list of rural women was prepared and ten respondents were selected randomly from each village, thus a total of 120 respondents constituted the sample for the investigation. Data were collected using pre-tested interview schedule. The data on socio-economic aspects like education, age, family type, land holding, occupation, income, mass media exposure were collected. The information was also gathered through focused group discussion and observation methods. Three aspects of household decision making were

*Associate Professor, SHUATS, Allahabad, U.P-211 007. Email address: dipak702002@yahoo.co.in.

identified that include socio-economic, demographic and political. The collected data were coded, tabulated, classified and analysed by both descriptive (percentage) and inferential (chi square) statistics were used.

RESULTS AND DISCUSSION

Socio-economic and demographic information of the respondents are presented in Table 1.

Table 1 indicates that majority (56.67%) respondents were middle aged followed by 24.17 per cent between 15-24 years, 15 per cent between 35-44 years of age and only 4.16 per cent respondents age was between 45-55 years.. The probable reason for such distribution might be that majority of the middle aged rural women perceived agriculture as a profitable avenue. Majority of the respondents (53.33%) were literate, while 46.67 per cent were illiterate. Regarding of the type of the family, majority (65.00%) of the respondents has nuclear family, while 35.00 per cent lived in joint family. About the occupation, it was found that agriculture (87.50%) was the major occupation of the family followed by agriculture + business (9.17 %) and agriculture + service were only 3.33 per cent. Similar findings are also reported by Hannan, 1994. The study reported that 86.67 per cent of the respondents were married, while 10.00 per cent were unmarried and only 3.33 per cent were widow. It was observed that 49.17 per cent of the family had low income followed by 44.17 per cent medium and only 6.66 per cent have high income group. The study revealed that 54.17 per cent farm women families had marginal land holding followed by 36.67 per cent small farmers and only 9.16 per cent families had large land holding Shobha, 2007. More than two thirds of the women got married at the age of between 15-19 years, 23.34 per cent at the age between 20-24 years, whereas only 3.33 per cent and 0.83 per cent respondents got married at the age of 25-29 years and 30-34 years respectively. Similar findings are also reported by Wasnik, 2006, Chanda *et al*., 2012 and Carlsson, 2013.

It was observed from Table 2 that all the illiterate, 95.83 per cent of primary, 88.89 per cent Junior High School, 71.42 per cent High School level of educated respondents are engaged in agricultural activities. On the other hand 4.16 per cent Primary, 11.11 per

Table 1: Socio Demographic profile of the respondents

Variable	Frequency	Percentage
Age		
15-24 years	29	24.17
25-34 years	68	56.67
35-44 years	18	15.00
45-54 years	05	4.16
Education		
Illiterate	56	46.67
Primary	24	20.00
Junior High School	18	15.00
High School	14	11.67
Intermediate	05	04.16
Graduate & above	03	02.50
Family Types		
Joint	42	35.00
Nuclear	78	65.00
Caste		
General	23	19.17
OBC	64	53.33
SC	33	27.50
Occupation		
Agriculture	105	87.50
Agriculture + Business	11	09.17
Agriculture + Service	04	03.33
Marital Status		
Married	104	86.67
Unmarried	12	10.00
Widow	04	03.33
Annual Income		
Low	59	49.17
Medium	53	44.17
High	08	06.66
Land holding		
Marginal	65	54.17
Small	44	36.67
Large	11	09.16
Age at First Marriage (in Yrs)		
15-19	87	72.50
20-24	28	23.34
25-29	04	03.33
30-34	01	00.83

Table 2: Association between level of education and occupation

Educational level of the respondents	Occupation			Total
	Agriculture	Agriculture + Business	Agriculture + Service	
Illiterate	56 (100.00)	0	0	56 (100.00)
Primary	23 (95.83)	01 (4.16)	0	24 (100.00)
Junior High School	16 (88.89)	02 (11.11)	0	18 (100.00)
High School	10 (71.42)	04 (28.58)	0	14 (100.00)
Intermediate	00	03 (60.00)	02 (40.00)	05 (100.00)
Graduate & Above	00	01 (33.33)	02 (66.67)	03 (100.00)
Total	105 (87.50)	11 (9.17)	04 (3.33)	120 (100.00)

Figures shows in the parenthesis are percentage.

Table 3: Association between level of education and level of purchasing decision

Educational level of the respondents	Level of Purchasing				Total
	Low	Medium	High	No Decision	
Illiterate	43 (76.78)	9 (16.08)	0	04 (7.14)	56 (100.00)
Primary	17 (70.83)	6 (25.00)	0	01 (4.17)	24 (100.00)
Junior High School	02 (11.11)	12 (66.67)	04 (22.22)	00	18 (100.00)
High School	00	08 (57.15)	06 (42.85)	00	14 (100.00)
Intermediate	00	01 (20.00)	04 (80.00)	00	05 (100.00)
Graduate & Above	00	00	03 (100.00)	00	03 (100.00)
Total	**62**	**36**	**17**	**05**	**120**

Figures shows in the parenthesis are percentage. Chi square value 14.137**

cent Junior High School, 28.58 per cent High School, 60 per cent Intermediate, 33.33 per cent Graduate completed respondents were engaged in agriculture with business, whereas 40 per cent Intermediate and 66.67 per cent Graduate and above educated respondents doing service as a main occupation with agriculture. The finding is in the line of the findings of Acharya, 2008 and Sujatha, 2009.

Table 3 shows that no lower level of education completed respondents had higher level of purchasing power, 76.78 per cent illiterate, 70.83 per cent primary and 11.11 per cent junior high school level educated respondents have low level of purchasing power. On the other hand cent per cent graduate & above, 80 per cent Intermediate, 42.85 per cent High School and 22.22 per cent junior high school level educated respondents have high level of purchasing power, whereas 20 per cent intermediate, 57.15 per cent high school, 66.67 per cent junior high school, 25 per cent primary and 16.08 per cent illiterate respondents have medium level of purchasing power. It was also observed that 7.14 per cent illiterate and 4.17 per cent primary level educated respondents never take participation in purchasing. Similar findings are also reported by Gupta, 2006 and Sujatha, 2009. The Chi-square shows that there is a positive and significant relationship between educational qualification and level of purchasing power at 0.1 percent level of significance. It indicated that higher in educational level greater in purchasing power.

CONCLUSION

It is concluded that there are several factors affect the ability of rural women to take part in the decision-making process; education plays a decisive role here. The overall socio-economic status of the respondents was medium level. Education status influence demographic variables for decision making. In many cases women and husbands jointly make decision that indicates the respect to each other and strong bonding in the family. Government should take proper steps to improve the literacy rate of women specially in the rural area and appropriate extension approach should be followed so that rural women can established their right in decision making in different household and others activities which will lead all round development of rural India.

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CONSTRAINTS CAUSING CONCERN TO TRIBAL LIVESTOCK OWNERS IN SEEKING INFORMATION FROM DIFFERENT SOURCES AND CHANNELS OF INFORMATION

Rohitash Kumar*, Tikam C. Goyal and N.K. Punjabi*****

ABSTRACT

The present study was conducted in purposively selected "Sirohi" district of Rajasthan. Thereafter, 8 villages of 2 tehsils were selected and a total of 120 tribal livestock owners were included in sample. It was observed that constraints perceived by the livestock owners in accessing information were i.e. Illiteracy, poverty, lack of basic knowledge in using communication media, language barrier, long distance of information centers, less availability of veterinary functionaries due to wide area coverage, lack of personal interest to seek information and unfelt need of livestock farmers for seeking information were the most serious constraints while as cultural beliefs/ inhibitions, lack of time, poor treatment of message, poor fidelity and high noise of communication media, poor availability of farm publication, unsuitable timing for radio and TV programmes and poor availability of livestock farm publication were the least serious constraints in the study area. It was recommended that simultaneous and cumulative efforts be made by the govt. and related agencies to overcome these constraints.

INTRODUCTION

Livestock sector is one of the important allied sectors which have proved to be an integral part of livelihood system of rural families and continues to be a major source of rural economy. There is rapid growth in the overall livestock production of our country which can be attributed to the technological revolution in A.H. and the successful adoption of recommended technologies by the rural farmers through different sources and channels of information dissemination by the extension agencies.

In order to transform livestock sector into information driven, modern and competitive sector, the role of Information sources and channels of information cannot be overruled. The people working in the livestock sector are least equipped with proper tools to deal with rapidly changing livestock production scenario and international competitive environment. This is partly due to inadequate use of new areas of information dissemination in various development programmes.

It is in this context, the proposed study was conducted to identify the constraints perceived by tribal livestock owners in seeking information from the various sources and channels of information.

RESEARCH METHODOLOGY

The study was conducted in Sirohi district of Rajasthan. The district Sirohi was selected purposively to the study purpose. Then two tehsils namely, Pindwara and Abu road were selected considering their maximum tribal population. Thereafter, four villages from each tehsils were selected. Thus, in all 8 villages were identified for the investigation purpose. Prior to collection of data, a comprehensive list of families who possess livestock for their livelihood was prepared for each selected village with the help of Panchayat officials and villagers. Then from the list, 15 families from each selected village were taken randomly as respondents for the purpose of present study. Thus, total 120 tribal families who possess livestock were selected as respondents for the present study.

Data were collected by the investigator through personal interview technique with the help of semi structured interview schedule and the collected data were tabulated and inferences were drawn by using appropriate statistical measures. The degree of constraints as perceived by the tribal livestock

*Teaching Associate, Dept. of Vety. & A.H. Extension Education, CVAS, Navania, Email: dr.rkdoot@gmail.com
**Assistant Professor, Dept. of Vety. & A.H. Extension Education, CVAS, Navania.
***Professor, Dept. of Vety. & A.H. Extension Education, CVAS, Navania.

owners were analyzed by taking a 3 point continuum i.e. most serious, serious and not so serious with their respective scores as 3, 2, and 1. In order to find out the priority area of constraints in various areas related to getting information, the mean score (MS) and mean percent score (MPS) for each constraint were calculated.

RESULTS AND DISCUSSION

The constraints were categorized into four categories i.e. socio-economic, technical, infrastructural and general constraints.

A. Socio-economic constraints perceived by tribal livestock owners in accessing information from sources and channels of information

Table 1: Socio-economic constraints perceived by tribal livestock owners in information access

S.No.	Socio-economic constraints	MPS	Rank
1.	Illiteracy	76.42	I
2.	Poverty	74.72	II
3.	Cultural beliefs	41.22	VIII
4.	Low level of income	70.00	III
5.	Lack of time	47.22	VII
6.	Lack of communication media	67.50	IV
7.	Lack of knowledge of credible source of information	66.94	V
8.	Poor sharing of information between livestock farmers	50.83	VI

The data accommodated in Table 1 clearly visualized that illiteracy was perceived as top priority constraint (MPS 76.42) by majority of the respondents. It can be observed that poverty is also causing serious concern to a significant number of respondents (MPS 74.72) in accessing valuable information from various sources and channels; it was ranked second by the respondents. Similarly low level of income was a bottleneck for majority of the respondents (MPS 70.00) which was ranked third in rank hierarchy. It is surprising to note that lack of communication media (MPS 67.50) and lack of knowledge of credible sources of information (MPS 66.94) were also found restraining more than 50% of respondents to access the needed information from the sources and channels. Followed these constraints, other were poor sharing of information (MPS 48.83), lack of time (MPS 47.22) and cultural beliefs (MPS 41.22) which were ranked as fifth, sixth and seventh in the rank order by the respondents.

An overview of the data in table shows that illiteracy coupled with poverty and low level of income are major hindrances in accessing information for the respondents and causing serious concern for majority of the livestock owners. The results are not unexpected due to ground reality in tribal areas where majority of the tribal livestock owners are illiterate and suffered poverty and low level of income.

Almost similar results were reported by Mtega and Benard (2013) and Jhala and Kala (2015) who found high illiteracy level and low income as the major factor that hamper accessibility to information sources.

B. Technical constraints perceived by tribal livestock owners in accessing information from sources and channels of information

Table 2: Technical constraints perceived by tribal livestock owners in information access

S.No.	Technical constraints	MPS	Rank
1.	Lack of basic knowledge in using communication media	68.05	I
2.	Language Barrier	66.66	II
3.	Complex technology difficult to understand	65.55	III
4.	Poor treatment of message	63.33	IV
5.	Poor fidelity and high noise of communication aids	61.65	V

The data accommodated in Table 2 clearly indicate that lack of basic knowledge in using communication media was perceived as most serious constraints with MPS 68.05 by majority of the respondents. It was ranked first by the respondents. It can be observed that language barrier is also causing serious constraints to a significant number of respondents (MPS 66.66) in accessing information from various sources and channels. It was ranked second by the respondents in rank order. It can be noted that complex technology difficult to understand (MPS 65.55) was a serious constraint for the subjects with third rank in the rank hierarchy, followed by this were

poor treatment of message (MPS 63.33) and poor fidelity and high noise of communication aids (MPS 61.65) which were ranked fourth and fifth in the rank order by the respondents.

These findings are in line with findings of Siyao (2012), Odini (2014) and Jhala and Kala (2015) who reported that language barrier was the major constraint faced by the farmers in accessing information.

C. Infrastructural constraints perceived by tribal livestock owners in accessing information from sources and channels of information

A perusal of data presented in Table 3 shows that long distance of information centers was realized as the most severe constraints perceived by tribal livestock owners having (MPS 84.72), it was ranked first by the respondents. The next significant constraints perceived by the respondents was less availability of veterinary functionaries due to wide area coverage with MPS 81.11 and it was ranked second in the rank order this was followed by in adequate number of veterinary functionaries and poor communication facilities was the serious constraints with MPS 79.44 and 67.22 so it was ranked third and fourth respectively. Further analysis of table clearly indicate that lack of rapport with veterinary officers and poor availability of livestock farm publication was considered as serious constraints by the subjects with MPS 42.50 and 40.50 with the rank fifth and sixth in the rank hierarchy respectively, followed by this was unsuitable timing for radio and TV programs with MPS 39.22 with a rank seventh by the respondents in the rank order.

Table 3: Infrastructural constraints perceived by tribal livestock owners in information access

S.No.	Infrastructural constraints	MPS	Rank
1.	Long distance of information centers	84.72	I
2.	Less availability of veterinary functionaries due to wide area coverage	81.11	II
3.	Inadequate number of veterinary functionaries	79.44	III
4.	Poor communication facilities	67.22	IV
5.	Lack of rapport with veterinary officers	42.50	V
6.	Poor availability of livestock farm publication	40.50	VI
7.	Unsuitable timing for radio and TV programmes	39.22	VII

The findings are in line with findings of Siyao (2012) and Benard (2014) who reported that inadequate number of extension agents was the major constraint faced by farmers in accessing information.

D. General constraints perceived by tribal livestock owners in accessing information from sources and channels of information

The data in Table 4 reveal that lack of personal interest to seek information was perceived as top priority constraints with MPS 90.55 by majority of the tribal livestock owners with rank first in the rank hierarchy. It can be observed that unfelt need of livestock farmers for seeking information, biased approach of veterinary functionaries and lack of

Table 4: General constraints perceived by tribal livestock owners in information access

S.No.	General constraints	MPS	Rank
1.	Lack of personal interest to seek information	90.55	I
2.	Unfelt need of livestock farmers for seeking information	82.50	II
3.	Biased approach of veterinary functionaries	66.66	III
4.	Lack of interest of veterinary functionaries	53.33	IV
5.	Reluctant and shy nature of livestock farmers	40.50	IX
6.	Approaching credible sources is difficult and costly affair	51.94	V
7.	Poor communication ability of field functionaries	48.05	VI
8.	Need based information not focused by veterinary functionaries	47.50	VII
9.	Less number of progressive livestock owners	41.22	VIII

interest of veterinary functionaries were the most severe constraint in seeking information with MPS 82.50, MPS 66.66 and MPS 53.33 with the rank second, third and fourth respectively. The next significant constraints perceived by the respondents were approaching credible sources is difficult and costly affair and poor communication availability of field functionaries with MPS 51.94 and 48.05 and ranked fifth and sixth respectively. Further analysis of table clearly indicate that need based information not focused by veterinary functionaries, less number of progressive livestock owners and reluctant and shy natured of livestock farmer were considered as serious constraints by the respondents with MPS 47.50, MPS 41.22 and MPS 40.50 were ranked seventh, eighth and ninth respectively. The findings are in line with findings of Siyao (2012) who reported that agriculture extension officers biased outlook was an important constraint in accessing information.

CONCLUSION

It can be concluded that illiteracy, poverty, lack of basic knowledge in using communication media, language barrier, long distance of information centers, less availability of veterinary functionaries due to wide area coverage, lack of personal interest to seek information and unfelt need of livestock farmers for seeking information were the most serious constraints perceived by the livestock owners in accessing information in the study area.

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ADDRESS
RAJASTHAN SOCIETY OF EXTENSION EDUCATION
Department of Extension Education
Rajasthan College of Agriculture
Outside Surajpole, Udaipur-313001, Rajasthan, INDIA
Phone: 0294-2410491 Fax: 0294-2418976
e-mail: rseeudaipur@rediffmail.com

Office address:

DEPARTMENT OF EXTENSION EDUCATION

Rajasthan College of Agriculture

Maharana Pratap University of Agriculture and Technology, Udaipur (Raj.) INDIA

Phone: 0294-2410491 Fax: 0294-2418976

e-mail: rseeudaipur@rediffmail.com Website: www.rseeudaipur.org

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