Print ISSN 2230 – 9047
Online ISSN 2231 – 6736
Vol. 9, No. 2, July-December, 2014

Journal of Community Mobilization and Sustainable Development

Society for Community Mobilization for Sustainable Development
New Delhi - 110 012

Journal of Community Mobilization and Sustainable Development

Registration No.: 268Ag. 33221; Print ISSN : 2230 - 9047; Online ISSN : 2231-6736

Biannual Journal of Society for Community Mobilization for Sustainable Development, New Delhi -12

Membership

Life Membership	**:**	**₹ 2,000**	**Institutional Membership**	**:**	**₹ 5,000**
Corporate Membership	**:**	**₹ 50,000**	**Foreign Membership**	**:**	**USD 500**
Online Indian Subscription :			Individual/Institutional	:	**₹ 600**
Online and Print Indian Subscription :			Individual/Institutional	:	**₹ 900**
Online for Foreign Subscription :			Individual/Institutional	:	**USD 60**
Online and Print for Foreign Subscription :			Individual/Institutional	:	**USD 90**

All correspondence may be made at the following address:

Chief Editor

Journal of Community Mobilization and Sustainable Development

Division of Agricultural Extension, Indian Agricultural Research Institute, New Delhi-12 (India)

E-mail: journalmobilization@yahoo.com

Website: www.mobilization.co.in

Available online: www.indianjournals.com

(Indexed in : Indian Science Abstract, EBSCO Discovery, Agricola and Google Scholar)

ABOUT THE SOCIETY

MOBILIZATION Society was established in 2003 as an non-profit professional society aimed at sensitizing and mobilizing development partners and community for sustainable development. The Society, during these ensuing years has successfully mobilized researchers, academicians, planners, grass root mobilizers and student and created conducive intellectual atmosphere for introspective deliberations and conducted National seminars/workshop to address the emerging problems experienced by the agrarian mass. Presently the Society has 860 Life Members. The recognition of the Society in the efforts for strengthening the forum for scientific communication is growing among the related professionals and concerned agricultural stakeholders rapidly. The Society works on following objectives-

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

ABOUT THE JOURNAL

Journal of Community Mobilization and Sustainable Development (print ISSN 2230 – 9047; online ISSN 2231 – 6736) is published by Society for Community Mobilization for Sustainable Development twice a year. The Journal of Community Mobilization and Sustainable Development has NAAS rating 3.46. The Journal of Community Mobilization and Sustainable Development, is also available on our website www.mobilization.co.in and it has been registered with www.indianjournal.com for national and global abstracting and indexing. MOBILIZATION envisages reorienting the young professionals and researches for imbibing the values of community participation in research, training and extension efforts.

The aim and scope of the journal are:

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

Editorial

The dusk of passing year-2014 has left many challenges in agricultural development of the country unabated and the warm & dynamic dawn of enthusiasm in the ensuing year-2015 are enlightening the new opportunities in research and development arena of Indian agriculture. Extension education needs to recognize the upcoming issues and vistas of agri-rural development of India. Indian Council of Agricultural Research (ICAR) has also mooted the innovative concept to be translated into action for sustainable farm development in the country. The new concepts of **Per drop more crop, Conservation agriculture, utilization of post offices for extension services, maintenance of soil health** are emerging for soil and irrigation water management, technology dissemination and information enabling to farmers so that the dream of our Hon'ble Prime Minister -**'Model Village-*Adarsh Gram*'** may be realized in the defined time frame. These batons are to be taken over by the extension professionals of the country in the very spirit in which they are framed and planned.

Society for Community Mobilization for Sustainable Development (MOBILIZATION) is constantly striving for stimulating the multi-sectoral stakeholders viz., researchers and extension professionals, innovative farmers, development practitioners and students for igniting their passion through different activities like bringing out research Journal, capacity building of all stakeholders, mobilizing for group action and holding the National Conference, etc. In this series, Society is organizing the National Seminar on **'Sustainable Rural Livelihood: Technological and Institutional Perspective' during January 8-10, 2015** at Sher-e-Kashmir University of Agricultural Sciences and Technology, Jammu at the main campus of Chatha, Jammu (J&K). The seminar is going to address the pertinent issues like futuristic extension approaches, farmer-led innovations, market driven farming systems, stakeholders' capacitation for group action, technological options for stressed agriculture and ICT enabling of Indian farmers. We are hopeful of meaningful outcomes from this seminar in the form of relevant action points holding greater significance for the researchers, policy makers and other professionals.

We are happy to bring out the second issue (July-December) of 2014 of the journal on this occasion. The issue has enveloped the research domain in the areas of employment pattern and occupational behaviour of horticultural farmers, assessment of seed delivery system, livelihood diversification and economics of off-season vegetables. Similarly, the information and training needs of farmers, impact assessment of technologies, prospects of direct seeded rice cultivation, and similar other aspect have also been included. The other issues like women empowerment, gender mainstreaming, and entrepreneurship as well as ICT application in agriculture, have also been given space in this issue.

I extend my heartfelt thanks to the members of the editorial team - Drs. Shantanu Kumar Dubey, M.S. Nain, R. Roy Burman, R.K. Dhaliwal, L.K. Tyagi, S.R.K. Singh and Souvik Ghosh who meticulously edited the papers to bring out the issue on time. I also express my sincere gratitude to the researchers for contributing the quality research papers for the journal. I extend my special thanks to Dr. Tulsi Bhardwaj in shaping this issue of the journal.

J.P. Sharma
Chief Editor

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 107-109, July-December, 2014

Satisfaction of Farmers Regarding Subsidies Provided Under National Food Security Mission

Navdeep Kakkar, Prabhjot Kaur and R.K. Dhaliwal
Department of Extension Education, Punjab Agricultural University, Ludhiana, Punjab

ABSTRACT

Government of India had launched Centrally Sponsored Scheme, 'National Food Security Mission' (NFSM) in August 2007 with the objective to increase production and productivity of wheat, rice and pulses on a sustainable basis so as to ensure food security of the country. The present study was conducted to know the level of satisfaction of farmers regarding the subsidies provided under NFSM. Ten farmers from all the 12 blocks of Ludhiana district of Punjab state (total 120 farmers) who had availed the subsidies, were taken as respondents for the study. The results revealed that the majority of the respondents were very much satisfied with the quality of inputs and amount of subsidy provided under the scheme, whereas, about one fifth respondents were dissatisfied with the quantity of inputs and timeliness of subsidy provided. Majority of the respondents had medium to high level of satisfaction with the subsidies provided under the scheme.

Keywords: National food security Mission, Satisfaction of farmers, Subsidy

INTRODUCTION

In view of the stagnating food grain production and an increasing consumption need of the growing population, Government of India had launched Centrally Sponsored Scheme, 'National Food Security Mission' (NFSM) in August 2007. The major objective of this scheme is to increase production and productivity of wheat, rice and pulses on a sustainable basis so as to ensure food security of the country. The approach is to bridge the yield gap in respect of these crops through dissemination of improved technologies and farm management practices. Beneficiary farmers have to contribute 50 per cent of cost of the activities to be taken up at their individual farm holding. The beneficiaries can choose to draw loans from the banks, in which subsidy amount prescribed for a particular component for which the loan is to be availed, will be released to the Banks.

The NFSM has begun well in its initial phase of implementation. The experiences of administering this scheme during the first year of its implementation was very satisfying in terms of ensuring quality of delivery of agricultural services to the farmers and good outcome achieved in the process. The focused approach of the mission with direct funding arrangement to the State and District level autonomous agencies and provisioning of dedicated project management teams for catalyzing result oriented implementation has been benefitting millions of farmers across the country in the targeted states and districts. The present study was conducted to know the level of satisfaction of farmers regarding the subsidies provided under NFSM.

MATERIALS AND METHODS

A list of farmers who had availed subsidies under National Food Security Mission was collected from the office of Chief Agriculture Officer, Ludhiana. All the 12 blocks of Ludhiana district were taken and from every block ten farmers who had availed the subsidies were selected randomly. So the total sample size was consisting of 120 farmers. Data were collected using interview schedule.

RESULTS AND DISCUSSION

Profile of the farmers: It relates to the information regarding socio-personal characteristics of respondents which included age, education, operational land holding,

mass media exposure, extension contacts and social participation. Data pertaining to profile of the farmers according to their socio-personal characteristics are presented in Table 1. The age of the respondents varied from 25-70 years and majority of the respondents were of the middle age group (40-55 years). Similar findings were reported by Josan (2002) and Kaur (2002). About half of the respondents (43.33%) were matriculates while 21.66 per cent were educated up to senior secondary, graduate and above. Since majority of the respondents belonged to age group of 40-55 years and lived in villages, when they were young, higher education was not thought to be a necessity and social obligation. It might be the reason that only 21.66 per cent of the respondents were educated up to graduate and above level. The above findings are similar to those reported by Khangura (2002). Respondents' operational land holding ranged from 5 to 100 acres. About two-third of the respondents (62.50 per cent) had large (>25 acres) operational land holding whereas about one-third (36 per cent) of the respondents had medium land holding (10-25 acres).

The State Department of Agriculture provided subsidies on various agricultural implements under NFSM. Subsidies were available on rotavator, seed-cum-fertilizer drill, multi-crop planter, laser land leveler, knap-sack spray pump, seeds, fertilizers, pesticides and herbicides. Subsidies on seeds, fertilizers, pesticides and herbicides were given to the farmers of Jagraon block of Ludhiana district who had grown pulses under A3P project. These are elaborated in Table 2.

Table 2: Distribution of respondents on the basis of items of subsidies and amount of subsidy availed by them

Items of subsidy	Freq-uency	Perce-ntage	Amount of subsidy (Rs.)
Rotavator	65	54.16	30,000
Seed cum fertilizer drill	37	30.83	15,000
Zero till drill	19	15.83	15,000
Seeds	4	3.33	2,000/qtl
Fertilizers and pesticides	3	2.50	5,00/acre
Multi crop planter	1	0.83	15,000

Satisfaction regarding different aspects of subsidy: The respondents were asked about within how many days after completion of formalities, they received the subsidy. The responses are placed in Table 3.The figures depicted that majority (37.50%) of the respondents had received the amount of subsidy after 60 days of completion of formalities, about 32 per cent of the respondents had received amount of subsidy between 31-60 days and remaining 30.83 per cent of the respondents had received the amount of subsidy in less than 30 days after completion of formalities.

Table 3: Distribution of respondents on the basis of time period for receipt of subsidy (n=120)

Time period	Frequency	Percentage
<30 days	37	30.83
31-60 days	38	31.67
After 60 days	45	37.50

Table 1: Distribution of respondents on the basis of socio-personal characteristics (n=120)

Socio-personal characteristics	Range/category	Frequency	Percentage
Age (years)	25-40 (young)	16	13.33
	40-55 (middle)	61	50.83
	55-70 (old)	43	35.84
Education	Illiterate	7	5.83
	Up to primary	9	7.50
	Up to Matric	52	43.33
	Senior secondary	26	21.66
	Graduation and above	26	21.66
Operational land holding (acres)	Marginal (<2.5)	-	-
	Small (2.5-5)	-	-
	Semi medium (5-10)	2	1.67
	Medium (10-25)	43	35.83
	Large (>25)	75	62.50

Table 4: Distribution of respondents on the basis of satisfaction regarding various aspects of agricultural subsidies

Statements	Very much Satisfied	Satisfied	Dissatisfied
Documentation Procedure	30(25.00)	78(65.00)	12(10.00)
Quality of inputs	110(91.67)	10(8.33)	-
Quantity of inputs	34(28.33)	59(49.17)	27(22.50)
Amount of subsidy	90(75.00)	28(23.33)	2(1.67)
Timeliness	32(26.67)	62(51.67)	26(21.66)
Criteria for givingSubsidy	35(29.17)	62(51.67)	23(19.16)

Table 5: Distribution of respondents on the basis of their level of satisfaction (n=120)

Level of satisfaction	Frequency	Percentage
Low (3-6)	15	12.50
Medium (6-9)	51	42.50
High (9-12)	54	45.00

Satisfaction of the respondents was recorded on three point continuum. Satisfaction related to various aspects of granting subsidy is presented in Table 4. The results revealed that the majority of the respondents were very much satisfied with the quality of inputs and amount of subsidy provided under the scheme, whereas, about one fifth respondents were dissatisfied with the quantity of inputs and timeliness of subsidy provided (Table 4). Roy (2011) had also reported that majority of the respondents shifted from low to medium livelihood security category after commencement of MNREGA - a centrally sponsored scheme, in the Burdwan and South Dinajpur districts of West Bengal. Level of satisfaction of respondents was studied by summing up the scores and categorized into three categories by using range method. Table 5 gives the level of satisfaction amongst the respondents. The data indicate that majority of the respondents had medium to high level of satisfaction with the subsidies provided under the scheme where as very few respondents (12.50%) had low satisfaction with the subsidy (Table 5).

CONCLUSION

It could be concluded from this study that farmers had medium to high level of satisfaction with the subsidy. They were very much satisfied with quality of inputs and amount of subsidy provided under the scheme. Documentation procedure, and criteria for giving subsidy were the other aspects related to subsidy with which farmers were satisfied.

REFERENCE

Josan, K. P. S. 2002. Pea cultivation in Nizampur village of Amritsar district in Punjab. M.Sc. Thesis. Punjab Agricultural University, Ludhiana, Punjab, India.

Kaur, A. 2002. Training needs of vegetable seed producers and status and scope of vegetable seed production in selected districts of Punjab. Ph.D. Dissertation. Punjab Agricultural University, Ludhiana, India.

Khangura, R.S. 2002. Adoption of selected recommended practices for pea cultivation by pea growers of Ludhiana district of Punjab. M.Sc. Thesis, Punjab Agricultural University, Ludhiana, India.

Roy, S. 2011. MNREGA: Changing Livelihood of the Beneficiaries in West Bengal. *Journal of Community Mobilization and Sustainable Development*, **6**(1): 37-41.

Received on December, 2013, Revised on May, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 110-113, July-December, 2014

Employment Pattern and Occupational Behaviour of Horticultural Farmers

C.L. Gour, S.K. Badodiya, Sarita Singh and Ravi Singh Gurjar
Department of Extension Education, R.V.S. Krishi Vishwa Vidhayalya, Gwalior, M.P.

ABSTRACT

An attempt was made to find out the preference of the subsidiary and off-seasonal occupations of horticultural farmers. The study was conducted on 120 farmers of Hoshangabad district of M.P. Dairy farming was the most preferred additional occupation for 37.50 per cent of the respondents, followed by, almost equal percentage of respondents preferring goat rearing and poultry, respectively, as their additional occupation. The majority of respondents had medium level of occupation behaviour. The major constraint for horticultural farmers during seasonal occupation was lack of capital.

Keywords: Horticultural growers, Occupation behaviour, Employment pattern

INTRODUCTION

In India agriculture is still the single largest source of employment in rural areas, though non-farm activities comprised of a highly diverse range of activities from manufacturing usually artisan to trading to the provision all kinds of services are becoming increasingly important. Most rural workers are self employed, whether it be on their own farms or in the small enterprises typical of rural non-farm activities. Hired workers are in the minority. Many poor households are now combing farm and off farm activities seasonally. Dramatic improvements in communications and transport have created conditions for large-scale internal movement of people at unprecedented levels. In the field of agriculture, the economic condition of agricultural labour depends largely on the level of employment in agriculture and allied sectors at which they are employed.

Occupational behavior is the study of individuals and their behavior within the context of the organization in a workplace setting. There are a variety of different models and philosophies of occupational behavior. One of the major challenge facing the developing countries including India is the need for generating more jobs in the farm sector. In the above context, an attempt was made to study the employment pattern and occupational preferences of horticultural farmers with the following objectives: (1) To study the personal and socio-economic traits of horticultural farmers. (2) To study the seasonal and off season occupation of horticultural farmers. (3) To explore the relationship between personal and socio-economic traits of horticultural farmers with their occupational behaviour. (4) To find out the constraints faced by the horticultural farmers during seasonal and off season occupation.

MATERIALS AND METHODS

The Hoshangabad District of M.P. was purposively selected because there were no recent exclusive studies about the off seasonal occupational patterns of the farmers. Hoshangabad district comprises seven blocks *viz.*, Seoni Malwa, Kesla, Hoshngabad, Babai, Sohagpur, Pipriya and Bankhedi. Among these, Kesla block was purposively selected. In Kesla block 10 villages where horticultural crops grown by the farmers were selected randomly for the study. A total of 120 respondents were interviewed from selected villages. A well-structured interview schedule was prepared for the collection of required information from the farmers. The personally collected data were processed, classified and tabulated for statistical analysis.

RESULTS AND DISCUSSION

The data on personal and socio-economic traits of horticultural farmers studied is presented in Table 1

Table 1: Percentage distribution of horticultural growers according to their socio-personal and socio-economic traits (n=120)

Characteristics	Percentage	Mean
Caste		
General caste	23.33	0.35
Other backward caste	46.67	0.71
SC/ST	30.00	0.46
Education		
Illiterate	09.17	0.16
Primary school	18.33	0.32
Middle school	38.33	0.66
High School	21.67	0.37
Above High School	12.50	0.21
Marital status		
Unmarried	15.83	0.29
Married	84.17	1.52
Farming experience		
Up to 5 years	30.00	0.49
5 to 10 years	46.67	0.76
Above 10 years	23.33	0.38
Annual Income		
Low	27.50	0.48
Medium	59.17	1.04
High	13.33	0.24
Occupation		
Agriculture/Horticulture	65.00	1.05
Agric./Horticulture+Business	25.83	0.42
Agric./Horti.+Business + Other	9.17	0.15
Economic Status		
Low	19.17	0.33
Medium	60.83	1.06
High	20.00	0.35
Land Holding		
Marginal (up to 2.5 acre)	12.50	0.21
Small (2.5 to 5 acre)	29.17	0.48
Medium (5 to 10 acre)	40.83	0.67
Large (above 10 acre)	17.50	0.29
Extension participation		
Low	20.83	0.39
Medium	52.50	0.97
High	26.67	0.49
Extension contact		
Low	22.50	0.40
Medium	43.33	0.77
High	34.17	0.60
Attitude towards horticultural crop production		
Less favourable attitude	24.17	0.41
Favourable attitude	60.83	1.03
More favourable	15.00	0.25
Knowledge about horticultural crop production		
Low	22.50	0.37
Medium	45.83	0.75
High	31.67	0.52

clearly indicate that majority of farmers had agriculture/ horticulture as their major occupation, had 5-10 yrs of farming experience, medium income and economic status. Majority of farmers had medium extension contact, medium knowledge of horticultural crop production and favourable attitude towards horticultural crops. Similar findings were reported by Nain and Chandel (2010). Out of twelve independent variables *viz.*, education, farming experience, annual income, occupation, economic status, land holding, extension participation, extension contact, attitude towards horticultural crop production and knowledge about horticultural crop production, were positively and significantly correlated with the occupational behaviour of horticultural farmers, except cast and marital status, which were not correlated (Table 2).

The data presented in Table 3 indicate that dairy farming was the most preferred additional occupation of 37.50 per cent of the respondents, followed by, almost equal percentage of respondents (21.66 per cent and 19.16 per cent), preferring goat rearing and poultry, respectively, as their additional occupations. Other additional occupations were, bullock cart operation (6.66%), power tiller operation (5.00%), duck rearing (4.16%), sericulture (2.50%), bee Keeping (1.66%) and mushroom cultivation (1.66%). The data presented in Table 4 shows that the masonry work, cleaning of channels and digging of ponds were the major off season vocations for 50 and 35 per cent of the

Table 2: Relationship between personal and socio-economic traits of horticultural farmers with their occupational behaviour

Variables	Correlation coefficient (r)
Caste	0.098^{NS}
Education	0.449**
Marital status	-0.080^{NS}
Farming experience	0.536**
Annual income	0.375**
Occupation	0.178*
Economic status	0.388**
Land holding	0.269*
Extension participation	0.221*
Extension contact	0.243*
Attitude towards horticultural crop production	0.320**
Knowledge about horticultural crop production	0.404**

* - Significant at p=0.05; ** - Significant at p=0.01 NS- Non Significant

Table 3: Distribution of respondents according to their additional occupational preference (n=120)

Occupations	Number	Percentage	Rank
Dairy farming	45	37.50	I
Goat rearing	26	21.66	II
Poultry	23	19.16	III
Mushroom Cultivation	2	1.66	VIII
Sericulture	3	2.50	VII
Bee Keeping	2	1.66	VIII
Duck rearing	5	4.16	VI
Power tiller operation	6	5.00	V
Bullock-cart operation	8	6.66	IV

Table 4: Distribution of horticulture growers/farmers according to their off seasonal occupations

Occupations	Number	Percentage	Rank
Masonry work	60	50.00	I
Channel cleaning and digging of ponds	42	35.00	II
Transport of river sand	22	18.33	IV
Work in factories and rice mills	23	19.17	III
Cutting of trees for firewood and wood for building construction	12	10.00	V
Farm guards	12	10.00	V
Farm workers	12	10.00	V
Broom making	9	07.50	VII
Carpentry work	8	06.67	VIII
Stone quarry	11	09.16	VI
Coconut harvest	7	05.83	IX
Tractor ploughing	6	05.00	X
Employment in brick kilns	4	03.33	XI

respondents, respectively. Transport of river sand, temporary work in factories and rice mills were found to be the off-season activities for 18.33 percent of the respondents whereas, 19.17 per cent respondents were found to be engaged in cutting of trees for fire wood and wood for building construction, farm workers, and farm guard. Similarly, an equal proportion of (10 per cent) of the respondents were found to be engaged in broom making, carpentry work and stone quarry, followed by, coconut from netting, ploughing and employment in brick kilns. Data in Table 5 shows that out of the total 120 respondents 22.50 per cent had low level of occupational behavior regarding horticultural production, while 45 per cent had medium and 32 per cent had high level of occupational behavior.

Table 5: Distribution of respondents according to their occupational behavior

Category	Frequency	Percentage
Low	27	22.50
Medium	54	45.00
High	39	32.50

Constraints faced by the horticultural farmers presented in Table 6 shows that lack of capital, non-availability of trained labours, non-availability of improved implements, non-availability of appropriate information, lack of transportation facilities, lack of technological knowledge and poor management facilities were major constraints in order of their seriousness. Prakash (2009) has also reported similar findings.

Table 6: Constraints faced by horticultural farmers during seasonal occupation

Constraints	Frequency	Percentage	Rank
Lack of technological knowledge	25	20.83	VI
Non-availability of trained labours	63	52.50	II
Non-availability of improved implements	57	47.50	III
Poor management facilities	12	10.00	VII
Lack of transportation facilities	35	29.17	V
Lack of capital	64	53.33	I
Non-availability of appropriate information	37	30.83	IV

CONCLUSION

This study concluded that majority of the respondents had medium category of occupational bahaviuor. Out of twelve independent variables ten variables *viz.* education, farming experience, annual income, occupation, economic status, land holding, extension participation, extension contact, attitude towards horticultural crop production and knowledge about horticultural crop production, were positively and significantly correlated with the occupational behaviour of horticultural farmers. Lack of capital and Non-availability of trained labours, were major constraints as reported by the horticultural farmers.

REFERENCFES

Bhople, R.S., P.S. Shinde and S.S. Dhule. 2001. Knowledge and adoption of bio-control pest management in cotton. *Maharashtra Journal of Extension Education*, **20**: 18-21.

Chothe, G.D. and M.M. Borkar. 2000. Constraints faced by farmers in adoption of bio-fertilizers. *Maharashtra Journal of Extension Education,***19**: 298-299.

Darling, B. Suji and J. Vasanthakumar. 2004. Knowledge and adoption of botanical pesticides, *Journal of Extension Education,* **15**(2&3): 3655-3658.

Dewey, D.R. and K.H. Lu. 1959. A correlation and path coefficient analysis of components of crested wheat grass seed production. *Agronomy Journal*, **51**: 515-518.

Karuna Jeba Mery, M.V., V. Ravichandran and K. Indumathy. 2013. Employment pattern and occupational preferences of horticultural farmers. *Journal of Extension Education,* **25**: 5131-5134.

Nain, M.S. and S.S. Chandel. 2010. Determinants of Farmers' Training Needs in Agri-horti Farming System: A Study of J&K State. *Journal of Community Mobilization and Sustainable Development*, **5**(2): 23-27.

Prakash, Vinod. 2009. Constraints and Suggestions Regarding the Technological Gap in Potato Production Technology in Uttar Pradesh. *Journal of Community Mobilization and Sustainable Development*, **4**(2): 16-19.

Venkatsh Gandhi, R. 2002. Knowledge level and Adoption behaviour of vegetable growers with respect to IPM of tomato crop in Kolar district. M.Sc. (Ag) Thesis. University of Agricultural Sciences, Dharwad.

Received on November, 2013, Revised on May, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 114-117, July-December, 2014

Constraints in Marketing of Fruits as Perceived by the Fruit Growers and NERAMAC in Assam

Litan Das, M.S. Nain, Rashmi Singh and R. Roy Burman
Division of Agricultural Extension, IARI, New Delhi-110012

ABSTRACT

Marketing of fruits has become a very important concern in India nowadays. Efficiency in marketing system can be improved by identifying the constraints faced by farmers and formulating appropriate strategy to ameliorate the constraints. A study was conducted to find out the constraints faced by NERAMAC (North Eastern Regional Agricultural Marketing Corporation Limited) as an organization and the fruits growers in Assam. The results showed that the NERAMAC beneficiaries of fruit crop growers ranked less intensity of advisory services and storage of harvested produce as the first and foremost major constraints in fruit production and marketing. The non-beneficiaries ranked fluctuating market price and finding appropriate market price of produces as first and second constraint, respectively. Lack of proper management of work and poor cooperation at grass-root level were the prominent organizational and functional constraints.

Keywords: Fruit growers, NERAMAC, Garrett's ranking technique, Organizational constraints, Marketing, Functional constraints

INTRODUCTION

Assam occupies first position in terms of fruit production and area among the states of the North Eastern Region. Among the fruits, oranges, pineapple, cashew nut, acid lime, mango, banana are major fruits grown in this region (CMISRC, 2005). North Eastern Regional Agricultural Marketing Corporation Limited (NERAMAC) is a central public sector undertaking promoted by North Eastern Council with certain degree of institutional innovation in the form of procurement of the marketable surplus of fruits and vegetables, its processing and marketing along with input support to producers. In addition to undertaking processing and marketing activity, it also takes up activities to enhance entrepreneurial skills of the fruit crop growers.

The main problem the farmers in North Eastern Region is the lack of an efficient marketing system (Planning Commission, 2007). There has been a major concern in recent years regarding the efficiency of marketing of fruits and vegetables, leading to high and fluctuating consumer prices and small share of the consumer rupee reaching the farmers. Sah *et al.* (2011) reported that lack of proper storage facilities in the region compel the farmers to dispose off majority of the produce immediately after harvest. Distant location of markets and poor road conditions leading to a high transportation cost and thus higher marketing cost for the farmers in the region. Raina *et al.* (2011) reported the flower growers felt lack of proper marketing channel and lack of price policy as the major problems. High involvement of middlemen in supply chain decreases the producers share in consumer rupee. Indian farmers are dependent heavily on middlemen particularly in fruits and vegetable marketing resulting in poor socio-economic conditions of the farmers.

Proper identification of constraints at organizational functional and farmer's level (beneficiary and non-beneficiary level) may provide guideline for policymakers in formulating an efficient and viable agricultural policy for producers of all sectors. The present study is an effort to fill the void through identification of the constraints in fruits cultivation and marketing and to suggest suitable strategy to solve this problems of the farmers of Assam.

MATERIALS AND METHODS

The study was conducted through stratified sampling technique. Two districts of Assam namely, Dhubri and

Karimganj, were selected and two blocks each from these districts namely, Mankachar and South Salmara, and Badarpur and South Karimganj were purposively selected from Dhubri and Karimganj district, respectively. Two villages from each block were randomly selected, making a total of 8 villages were studied. The fruit crop growers associated with NERAMAC and non-beneficiary farmers formed the respondents of the study. The total 80 NERAMAC beneficiaries, 40 non-beneficiaries and the entire available field functionaries of NERAMAC in the study area were interviewed. The farmers were asked to rank the constraints in the order of importance. The collected details were analyzed using the Garrett's Ranking Technique. By using this technique, the order of the merits given by the respondents was changed into ranks by using the following formula:

$$\text{Percent position} = \frac{100 * (Rij - 0.5)}{Nj}$$

Where, Rij= rank given for i^{th} factor by j^{th} individual
Nj= number of factors ranked by j^{th} individual.

The per cent position of each rank was converted into scores by referring table (Garrett and Woodworth, 1969). Then for each factor, the scores of individual respondents were added together and divided by the total number of respondents for whom scores were added. These mean scores for all the factors were arranged in descending order and the constraints were ranked.

RESULTS AND DISCUSION

Different constraints faced by NERAMAC officials and fruit crop growers were enlisted and farmer's responses on their severity were solicited. The ranking obtained for different organizational constraints with their respective Garrett's mean score is presented in Table 1 for members of NERAMAC. The data shows that the most prominent problem faced by the organization is lack of proper management and co-ordination among the members with Garrett's ranking score 75.176, followed by lack of competent and skilled staff with Garrett's score 63.876. As such, there is a need of proper training of human resources. Similar result were described in IFPRI research report (2009). Lack of proper communication was ranked third with Garrett's score 54.341. The result is similar with Christensen and Raynor (2003). The field functionaries get training in case of principle knowledge by the scientists but the training in extension approach was lacking as such need of proper communication system among the members was felt. The next constraint was huge work load in conducting different organizational activities followed by lack of proper transport facilities, lack of job rotation in work and lack of proper planning, respectively.

Table 1: Organizational constraints faced by stakeholders of NERAMAC

Organizational constraints	Mean score	Rank
Improper management in co-ordination of work	75.176	I
Lack of competent and skilled staff	63.879	II
Lack of communication in organization	54.341	III
Every member has huge work pressure	49.985	IV
Lack of proper transport facilities	45.462	V
Lack of job rotation in work	44.045	VI
Improper planning	39.798	VII
Lack of funding	35.876	VIII
Problem of job security of field level worker	33.646	IX
Problem of proper guidance	32.434	X

The functional constraints as perceived by clients, field level workers and outlet operators are shown in Table 2. It can be observed that lack of cooperation from ground level organization was the predominant constraints with Garrett's score 75.232. Lack of coordination was also a major problem among the

Table 2: Functional constraints faced by clientele and stakeholders of NERAMAC

Functional constraints	Mean score	Rank
Poor cooperation of grass root level organizations	75.232	I
Lack of farmers awareness	64.870	II
Less intensity of advisory work	60.725	III
Farmers participation at ground work	57.880	IV
Negligence towards small and marginal farmers	54.987	V
Maintaining cost of equipments	52.876	VI
Inadequate supply of inputs at proper time	45.786	VII
Improper procurement services	37.876	VIII
Lack of storage facilities	35.323	IX
Non-availability of government support	34.123	X

Table 3: Constraints faced by beneficiaries and non-beneficiaries of NERAMAC in fruit crop cultivation and marketing

Constraints	Mean scores		Ranks	
	Beneficiary	Non-beneficiary	Beneficiary	Non-beneficiary
Less intensity of advisory services	72.540	42.939	I	VIII
Storage of harvested produce	67.813	60.209	II	IV
Lack of village organization	64.762	55.876	III	V
Difficulty in finding appropriate price of produces	62.720	65.173	IV	II
Backward linkage facilities	57.901	50.492	V	VI
Fluctuating market price	55.472	69.540	VI	I
Distress selling of produces	52.652	30.387	VII	X
High Transportation charges	45.839	38.221	VIII	IX
Market glut due to lack of processing unit	37.421	62.752	IX	III
Non availability of labour	32.377	47.872	X	VII

organization at ground level followed by less farmers' awareness (Garrett's score 64.870) and less intensity of advisory work. The results are in consonance with Atchuta Raju *et al.* (2001). Less participation of farmer in village workshop was ranked fourth, followed by, negligence towards small and marginal farmers, high cost of maintaining equipments and inadequate supply of inputs, improper procurement services, lack of storage facilities and non-availability of government support, respectively.

The beneficiaries of NERAMAC ranked less intensity of advisory services as the first (with Garrett's score 72.540) and foremost constraints, followed by, the storage of harvested produce (with Garrett's score 67.813) in Table 3. Other major constraints like lack of village organization, difficulty in finding appropriate price of produce, backward linkage facilities, fluctuating market price, distress selling of produce, high transportation charges, etc. were major concerns for farmers in the region.

The ranking obtained for different constraints in fruit marketing for non-beneficiaries with their respective Garrett's mean score is also presented in Table 3. According to non-beneficiaries, fluctuating market price and finding appropriate market price were ranked in foremost major constraint in the order of importance (with Garrett's score 69.540 and 65.173, respectively), followed by, market glut due to finding appropriate processing unit or juice factory followed by finding proper storage facilities were also perceived as serious constraint by non-beneficiaries as they lack proper infrastructure backup as compared to the beneficiaries of NERAMAC.

Getting the right price of produce, good storage facilities and lack of village organizations were the severe problems equally ranked high by both beneficiary and non-beneficiaries. To meet high quality standards and get good revenue for their produce in global markets, the grading aspects with getting the produce certified as quality products need focus. The beneficiary farmers rated market related constraints at lower level of seriousness as they are already getting good support from NERAMAC for marketing of their produces.

CONCLUSION

It can be concluded that to get higher level of profit and to accelerate the growth of fruit production in the North Eastern Region, the barriers in the form of constraints have to be minimized or removed. Regular training of staffs in organizational coordination and management has to be conducted. Focus should be given for developing the coordination with farmers and leadership development. It is very important to maintain good organizational climate. For functional effectiveness, the most prioritized constraint have to be solved through linkage with ATMA, SAUs, KVKs and other governmental or non-governmental organizations for better grass-root level coordination. Backward linkage for improved planting materials and environmental friendly inputs for increased production of fruit crops need to be strengthened. NERAMAC should increase activities and training grading aspect of products for improving in quality and reducing losses.

REFERENCES

Atchuta Raju, K., G.S. Roy, T.S. Kamala and M.S. Rani. 2001. Constraints and suggestions for effective implementation of farm women development programmes. *Manage Extension Research Review*. July-December, 2001.

Christensen, C.M. and M.E. Raynor. 2003. The innovator's solution. Creating and sustaining successful growth. Cambridge, Mass., U.S.A.: Harvard Business School Press.

CMI SRC 2005. Export Potential of Horticultural products from North eastern States. By CMI Social Research Center, sponsored by APEDA, New Delhi. Available at http:// mdoner.gov.in.

Garrett, E. and R.S. Woodworth. 1969. Statistics in psychology and education. Vakils Feiffer and Simons Private Limited, Bombay, p. 329.

IFPRI Research report 162, 2009. Successful organizational learning in the management of agricultural research and innovation. Washington, D.C.

Mukherjee, A., R. Bahal., R. Roy Burman, S.K. Dubey and G.K. Jha. 2012. Constraints in Privatized Agricultural Technology Delivery System of Tata Kisan Sansar. *Journal of Global Communication,* **5**(2):155-159.

Planning commission 2007. Rural Marketing System in the North Eastern States: Problems, Diagnosis and Strategy Perspective. Available at http://planningcommission. gov.in/reports/sereport/ser/stdy_rulmak.pdf.

Raina, V.; M.S. Nain, B.S. Hansra and D. Singh. 2011. Marketing Behaviour and Information Sources Utilization Pattern of Flower Growers. *Journal of Community Mobilization and Sustainable Development*, **6**(2): 180-184.

Sah, U., S.K. Dubey and J.P. Sharma. 2011. Potato Marketing in North East Region of India: A Diagnostic Study. *Journal of Community Mobilization and Sustainable Development*, **6**(2): 194-201.

Received on January, 2014, Revised on August, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 118-119, July-December, 2014

Assessment of Information Needs of Farmers about Mustard Production Technology

Kamlesh Kumar Chaurasiya and Prashant Sharma
College of Agriculture, RVSKVV, Gwalior, M.P.

ABSTRACT

The study was based on primary data collected from 110 randomly selected farmers of Ater block of Bhind district of Madhya Pradesh. In this study, an attempt was made to find out the information needs of mustard growers. The result of the study revealed that most of the mustard growers have high information needs. The study further indicates that education, landholding, annual income, social participation, risk preference, farming experience, utilization of different source of information, knowledge and adoption behaviour were found to be positively corelated with information need.

Keywords: Mustard growers, Production technology, Information need

INTRODUCTION

Mustard and rapeseed are known by different names in different places e. g. *sarson, rai, toria*. While *sarson* and *toria* are generally termed as rapeseed, *rai* is termed as mustard. The oil obtained from different types show slight variation in oil percentage. The oil content varies from 38 to 50 per cent. The seed and oil are used in industries and as condiment in the preparation of pickles and for flavoring curries and vegetables. The oil cake is used as the cattle feed and manure. Green stem and leaves are a good source of green fodder for cattle. Access to adequate information is very essential to increase agricultural productivity (Sharma *et al.*, 2012). Typically poor and illiterate, rural Indian farmers generally have very limited access to information regarding improved farm techniques (Jain, 2011). The focus of this study therefore, is assessment of information need of farmers about mustard production technologies in Ater Block of Bhind District.

MATERIALS AND METHODS

The present study was carried out in Ater block of Bhind district of Madhya Pradesh.10 villages were selected randomly from mustard cultivated villages 11 farmers from each village were selected. Thus, the total sample 110 farmers were drawn for investigation. The information need of farmers about mustard production technology were computed by using scoring techniques adopted for this purpose.

RESULTS AND DISCUSSION

Table 1 indicates that the information need of the mustard growers with regards to policy information, most of the farmers (43.63%) was found of the medium

Table 1: Information need of the mustard growers

Name of area	Information need					
	Low		Medium		High	
	No.	%	No.	%	No.	%
Policy information	20	18.18	48	43.63	42	38.19
Market information	19	17.27	41	37.27	50	45.46
Technological information	18	16.39	32	29.09	60	54.55
Other information	47	42.73	38	34.54	25	22.73

Table 2: Distribution of respondents according to their overall information need about mustard production technology

Information need	Respondents (n=110)	
	Frequency	Percentage
Low	23	20.91
Medium	42	38.18
High	45	40.91

Table 3: Correlation coefficient between characters and information need about mustard production technology.

S.No.		Variables	'r' values
1.	X_1	Age	0.184^{NS}
2.	X_2	Education	0.523**
3.	X_3	Caste	0.026^{NS}
4.	X_4	Land holding	0.356**
5.	X_5	Annual income	0.437**
6.	X_6	Social participation	0.412**
7.	X_7	Risk preference	0.365**
8.	X_8	Farming experience	0.431**
9.	X_9	Utilization of different sources of information	0.212*
10.	X_{10}	Knowledge about mustard production technology	0.438**
11.	X_{11}	Adoption behaviour of mustard production technology	0.361**

NS = Non-significant; *Significant at 0.05 level of probability; **Significant at 0.01 level of probability

level followed by 38.19 per cent in high information need, while only 18.18 per cent of the respondents were in low level of information need.

As regards to market information, most of the farmers (45.46%) had high level of information need while 37.27% had medium information need and only 17.27% of the respondents had low level of information need. Regarding technology information, the majority (54.55%) of respondents had high level of information need while 29.09% had medium information need and 16.39 per cent of the respondents had low level of information need. In case of other information need, most of the farmers (42.73%) had low level of information need while 34.54 and 22.73 per cent of the respondents were having medium and high levels of information need respectively. It was observed from the data presented in Table 2 the most of the farmers (40.91%) belonged to high information need category about recommended production technology of mustard, whereas 38.18 and 20.91 per cent of them belonged to medium and low information need categories respectively. Thus, it has been inferred that most of the mustard growers belonged to high overall information need category.

Table 3 revealed that like education, land holding, annual income, social participation, risk preference, farming experience, utilization of different sources of information, knowledge about mustard production technology, adoption behavior of mustard production technology show the significant relationship with information need while age and caste show the non-significant relationship.

CONCLUSION

Most of the farmers belonged to high information need category about recommended production technology of mustard. The study further concludes that education, landholding, annual income, social participation, risk preference, farming experience, utilization of different source of information, knowledge and adoption behaviour were found to be positively related with information need.

REFERENCES

Jain, S. 2011. Information Empowerment of Rural People in Agriculture through e-Choupal. *Journal of Community Mobilization and Sustainable Development,* **6**(1): 57-61.

Sharma, Arpita, Adita Sharma and Amita Saxena. 2012. Information utilization among rural fish farmers in Uttarakhand. *Journal of Community Mobilization and Sustainable Development,* **7**(1): 95-100.

Received on November, 2013, Revised on May, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 120-123, July-December, 2014

Seasonal Variations in the Milk Minerals of Jakhrana Goats under Field and Farm Rearing Conditions

Gitam Singh, R.B. Sharma and Ragini Mishra
K.V.K., Tonk, Rajasthan–304022

ABSTRACT

In global scenario, India ranks second in terms of goat population and occupy top position in goat milk production. The study was conducted at the Central Institute for Research on Goats, Makhdoom, Mathura for documenting farm rearing condition. Milk samples were collected from Jakhrana goat under the farm and field rearing condition. Calcium percentage in the milk of Jakhrana breed under field and farm rearing conditions in summer, rainy and winter seasons was found to be 0.136±0.0019 and 0.142±0018, 0.140±0.0018 and 0.146±0.0019 and 0.144±0.0023 and 0.151±0.0018, respectively. It was also observed that phosphorus per cent in the milk of field rearing conditions was lower than that of farm rearing conditions in all seasons. Potassium percentage in the milk under field and farm rearing conditions in summer, rainy and winter seasons was found to be 0.110±0.0008 and 0.111±0.0008, 0.111±0.0008 and 0.112±0.0009 and 0.112±0.0007 and 0.113±0.0008 respectively. Magnesium percentage in the milk of Jakhrana goat breed under field and farm raring conditions in summer, rainy and winter seasons was found to be 0.0136±0.00014 and 0.0142±0.00016, 0.0140±0.00010 and 0.0146±0.00012 and 0.0144±0.00011 and 0.0150±0.00013, respectively. Highest chloride and selenium content in milk was found in winter season irrespective of field or farm rearing conditions. It was concluded that season had conspicuous effects on milk quality of goats under study.

Keywords: Milk Minerals, Jakhrana Goats, Farm Rearing

INTRODUCTION

Goats play a vital socio-economic role in Asian agriculture, particularly for resource-poor people living in harsh environments. Goats are more often poorly managed and this is attributed to their ability to survive under harsh conditions and also because most people in rural areas rear goats for their subsistence purposes to support their families. This benefit is often not shown in national statistics because of informal trading and slaughtering. Goats are often neglected but have served mankind with meat, milk, hair, leather and products including manure for many centuries (Webb *et al*., 2005).

Non-cattle milk accounts for approximately 15% of the total milk consumption by humans worldwide. Asia contributes approximately 59% to world goat milk production. The global goat population currently stands at 921 million, of which over 90% are found in developing countries. Asia is home to about 60% of the total world goat population and has the largest goat breed share of 26% (FAO, 2012). Goat population in India was 125,732,000 in 2008; 39 goat breeds; 1,139,965,000 human population in 2008; 1,080 US$ gross national income per capita (Shrestha *et al*., 2010, 2011).

Goat milk proteins have different amino acid make-up as compared to the milk of other mammalian species, especially in relative proportion of various milk proteins and in their genetic polymorphisms (Addeo *et al*., 1988 and Ambrosoli *et al*., 1988). The composition of goat milk fat, prevalence of large numbers of small fat globules, differ significantly from those of cow milk fat under average feeding conditions. Goat milk fat normally has 35 percent of medium chain fatty acids (C_6-C_{14}) as compared to cow milk fat, which has only 17 percent (Haenlein, 1992).

Milk is a complex biological fluid containing proteins, fats, carbohydrates, vitamins, minerals and

enzymes. The nature and concentration of milk components are influenced by various production and processing factors such as age, breed, season, multiple births, stage of lactation (Singh *et al.,* 1990; Kala and Prakash, 1990), plane of nutrition (Sachdeva *et al.,* 1974; Singhal *et al.,* 1985) and management of goats. The chemical and physical characteristics of colostrums are greatly affected by postpartum time and slightly affected by litter size and lactation number (Argüello *et al.,* 2006).

MATERIALS AND METHODS

The study was conducted at the Central Institute for Research on Goats, Makhdoom, Mathura for the study of farm rearing condition. Milk samples were collected from Jakhrana goat under the farm and field rearing condition. Field samples were collected from different villages. The Jakhrana breed milk samples were from villages of Mathura and Agra districts, India (27°10´N, 78-° 002´E and 169 m above MSL). Geologically, the Institute is situated under Yamuna river semi arid soil. Temperature ranges between 6°C in winter to as high 45°C in summer. Annual average rainfall is a period of 50-60 days. Monsoon arrives in mid July and active till mid September (Agnihotri and Rajkumar, 2007). The methodology was an adaption from Bourbouze (1995) and Alvarez Funes and Paz Motola (1997).

A total of 479 milk samples were collected from field and farm rearing condition 222 single (field 28 and farm 194), twins 230 (field 66 and farm 164) and triplets 27 (field 08 and farm 19) milk samples.Goat milk samples were collected from research farm and field properly at varied environmental conditions and seasons (summer, rainy and winter). The composition was determined by Electronic Milk Analyzer (Lactoscan SA, Milkatronics Ltd. Bulgaria) before the analysis of each sample was thawed at 30°C to melt the fat and then cooled to 20°C. Determination of minerals was followed (Magnesium and Selenium) by Atomic Absorption Spectrophotometer (AAS), determination of Calcium and Potassium by Flame Technique and Phosphorus and Chloride by chemical methods.

Data were recorded as means +/– standard deviation to compare and analyze using randomized block design, ANOVA and Fisher's least significant difference procedure with software SAS Institute Inc. (1990). 95% level of significance was used for all analyses.

RESULTS AND DISCUSSIONS

It is evident from the Table 1 that the calcium percentage in the milk of Jakhrana breed under field and farm rearing conditions in summer, rainy and winter seasons was found to be 0.136±0.0019 and 0.142±0018, 0.140±0.0018 and 0.146±0.0019 and 0.144±0.0023 and 0.151±0.0018, respectively. Our result further showed that highest calcium content was found in winter seasons under field as well as farm rearing conditions. It is observed from the ANOVA Table 2 that the seasonal effect on calcium content was significantly different in Jakhrana goat breed milk under field and farm rearing conditions at 5% level of significance. The are similar with the findings of Belewu and Aiyegbusi (2002).

Further, the phosphorus percentage in the milk of Jakhrana breed under field and farm rearing conditions in summer, rainy and winter seasons was found to be 0.121±0.001 and 0.124±0.0009, 0.123±0.0011 and 0.125±0.0009 and 0.128±0.0012 and 0.129±0.0010, respectively. The data shows that phosphorus content was highest in winter seasons and lowest in summer seasons under field and farm rearing conditions. It was also observed that phosphorus per cent in the milk of field rearing conditions was lower than that of farm rearing conditions in all seasons. Analysis of variance for the effect of seasons on phosphorus content of milk of Jakhrana goat breed under field and farm rearing condition was analyzed and found that significant variation was observed in all seasons. The results obtained on phosphorus content are fully corroborated with the findings of Pal *et al.* (2011).

The potassium percentage in the milk under field and farm rearing conditions in summer, rainy and winter seasons was found to be 0.110±0.0008 and 0.111±0.0008, 0.111±0.0008 and 0.112±0.0009 and 0.112±0.0007 and 0.113±0.0008, respectively. Potassium content was significantly greater in farm samples than field rearing samples in all seasons. The highest potassium percentage was recorded in winter seasons under field or farm rearing conditions. The statistical analysis also revealed the effect of seasons on potassium content under field and farm rearing conditions. The value reported by Pal *et al.* (2011) for seasonal effect on potassium content in same goat breed's milk support results of present study. The magnesium percentage in the milk under field and farm

Table 1: Effect of season on the percentage of milk minerals components of Jakhrana goats under field and farm rearing conditions

S.No.	Component of goat milk	Field	Farm	Overal Average	Test of significance	Table value (t) 5%	1%
1.	**Calcium**						
	(i) Summer	0.136±0.0019	0.142±0.0018	0.139±0.0018	2.060^{+}		
	(ii) Rainy	0.140±0.0018	0.146±0.0019	0.143±0.0019	2.354^{+}	1.960	2.576
	(iii) Winter	0.144±0.0023	0.151±0.0018	0.147±0.0020	3.631^{++}		
2.	**Phosphorus**						
	(i) Summer	0.121±0.001	0.124±0.0009	0.1225±0.0010	2.061^{+}		
	(ii) Rainy	0.123±0.0011	0.125±0.0009	0.1240±0.0010	1.816^{NS}	1.960	2.576
	(iii) Winter	0.128±0.0012	0.129±0.0010	0.1285±0.0011	1.349^{NS}		
3.	**Potassium**						
	(i) Summer	0.110±0.0008	0.111±0.0008	0.1105±0.0008	1.913^{NS}		
	(ii) Rainy	0.111±0.0008	0.112±0.0009	0.1115±0.0009	1.809^{NS}	1.960	2.576
	(iii) Winter	0.112±0.0007	0.113±0.0008	0.1125±0.0008	1.698^{NS}		
4.	**Magnesium**						
	(i) Summer	0.0136±0.00014	0.0142±0.00016	0.0139±0.00015	4.333^{++}		
	(ii) Rainy	0.0140±0.00010	0.0146±0.00012	0.0143±0.00012	4.831^{++}	1.960	2.576
	(iii) Winter	0.0144±0.00011	0.0150±0.00013	0.0147±0.00012	3.996^{++}		
5.	**Chloride**						
	(i) Summer	0.103±0.00060	0.106±0.0006	0.1045±0.0006	2.206^{+}		
	(ii) Rainy	0.106±0.00064	0.108±0.00056	0.107±0.0006	2.179^{+}	1.960	2.576
	(iii) Winter	0.108±0.0008	0.110±0.0005	0.1100±0.0005	2.046^{+}		
6.	**Selenium**						
	(i) Summer	0.01668±0.000049	0.01651±0.00006	0.01664±0.000055	5.466^{++}		
	(ii) Rainy	0.01696±0.000058	0.01664±0.00006	0.01680±0.000060	4.021^{++}	1.960	2.576
	(iii) Winter	0.01709±0.000058	0.01685±0.00005	0.01697±0.000055	3.963^{++}		

NS = Non Significant; ++ = Significant at p <0.05 = Significant at 5% level of significance

raring conditions in summer, rainy and winter seasons was found to be 0.0136±0.00014 and 0.0142±0.00016, 0.0140±0.00010 and 0.0146±0.00012 and 0.0144± 0.00011 and 0.0150±0.00013, respectively. The statistical analysis revealed that magnesium content under field rearing conditions in Jakhrana goat breed milk in all seasons was significantly lower than that of farm rearing samples. The highest magnesium content was observed in winter seasons under field as well as farm rearing samples. The ANOVA Table also revealed that the effect of seasons on magnesium content was significantly different in Jakhrana goat breed milk under field and farm rearing conditions at 1% level of significance. Results on magnesium in different seasons in the milk of Jakhrana goat breed are in fair agreement with the findings of Pal *et al.* (2011) for Indian goat breeds.

The chloride percentage in the milk of Jakhrana goat breed under field and farm rearing conditions in summer, rainy and winter seasons was found to be 0.103±0.00060 and 0.106±0.0006, 0.106±0.00064 and 0.108±0.00056 and 0.108±0.0008 and 0.110±0.0005 respectively. Variation in chloride content under field and farm rearing conditions was observed to be significantly in milk samples. Highest chloride content in milk was found in winter season irrespective of field or farm rearing conditions. The statistical analysis also revealed that the effect of seasons on chloride content

Table 2: ANOVA for the effect of season on goat milk under field and farm rearing conditions

Contents for the source of variance	Variance ratio Field	Farm	F- Value table 5%	1%
Calcium	3.116^{+}	3.347^{+}	3.00	4.610
Phosphorus	4.219^{+}	4.600^{+}	3.00	4.610
Potassium	3.966^{+}	4.341^{+}	3.00	4.610
Magnesium	6.316^{++}	3.259^{++}	3.00	4.610
Chloride	3.214^{+}	3.679^{+}	3.00	4.610
Selenium	4.630^{++}	3.880^{++}	3.00	4.610

was significantly different in Jakhrana goat breed milk under field and farm rearing conditions at 1% level of significance. The results on chloride in different seasons in the milk of Jakhrana goat breed are in fair agreement with the findings of Pal *et al.* (2011) for Indian breeds.

The results laid down in Table 1 indicated that the selenium percentage in the milk of Jakhrana goat breed under field and farm rearing conditions in summer rainy and winter seasons was found to be 0.01668±0.000049 and 0.01651±0.00006, 0.01696±0.000058 and 0.01664±0.0006 and 0.01709±0.000058 and 0.01685± 0.00005, respectively. Selenium content was significantly greater in field samples than farm rearing samples in all seasons. The highest selenium percentage was recorded in winter seasons under field or farm rearing conditions. The statistical analysis also revealed that the effect of seasons on selenium content was significantly different in Jakhrana goat breed milk under field and farm rearing conditions at 1% level of significance.

CONCLUSION

The calcium, phosphorus, potassium, magnesium and chloride percentage in the milk of Jakhrana goat breeds under farm rearing conditions was significantly higher than that of field rearing conditions. Season had conspicuous effects on milk quality of goats under study.

REFERENCES

Addeo, F., R. Mauriello, and A. Luccia. 1988. Agel electrophoretic study of caprine casein. *Journal of Dairy Science,* **55**: 413-421.

Agnihotri, M.K. and V. Rajkumar. 2007. Effect of breed, pairity and stage of lactation on milk composition of western region goats of India. *International Journal of Dairy Science,* **2**(2): 172-177.

Alvarez Funes R. and R. Paz Motola. 1997. Metodolog´ýaasociada al diseño de propuestaspara el desarrollo de la producciónlecheracaprina (Associated methodology for the design of proposals for development of milk goat production). *Archivos de Zootecnia,* **46**: 211–224.

Ambrosoli, R., L.S. Di and P. Mazzocco. 1988. Content of alpha-s-1 casein and coagulation properties in goat milk. *Journal of Dairy Science,* **71**: 24-28.

Arguello, A., N. Castro, S. Alvarez and J. Capote. 2006. Effect of the number of lactations and litter size on chemical composition and physical characteristics. *Small Ruminant Research,* 64: 53-59.

Belewu, M.A. and O.F. Aiyegbusi. 2002. Comparison of the mineral content and apparent biological value from human, cow and goat milk sources. *Journal of Food Technology Africa,* **7**: 9-11.

Bourbouze, A. 1995. Goat production system study methods. In: El Aich, A., Landau, S., Borbouze, A., Rubino, R., Morand-Fehr, P. (Eds.), Goat Production Systems in the Mediterranean, vol. 71. EAAP Publication, Wageningen Pers, Wageningen, pp. 6–19.

FAO. 2012. Food and Agricultural Organization, United Nations <http: //faostat.fao.org /site /339/ default.aspx>.

Haenlein, G.F.W. 1992. Role of goat meat and milk in human nutrition. Proceedings of 5th International conferences on Goats (R.M. Acharya, ed.), ICAR, New Delhi, India, Indian Agr. Res. Serv. Publ. *Recent Advances in Goat Production,* **II**(2): 575.

Kala, S.N. and B. Prakash. 1990. Genetic and phenotypic parameters of milk yield and milk composition in two Indian goat breeds. *Small Ruminant Research,* 3: 475-484.

Pal, U.K., P.K. Mandal, V.K. Rao and C.D. Das. 2011. Quality and Utility of Goat Milk with Special Reference to India: An Overview. *Asian Journal of Animal Sciences,* **5**: 56-63.

Sachdeva, K.K., O.P.S. Sengar, S.N. Singh and L.L. Lindal. 1974. Effect of plane of nutrition on milk production and composition. *Milch-wissenschaft,* **29**: 471.

Shrestha, J.N.B. and E.S.E. Galal. 2010. Conservation of goat genetic resources. In: Solaiman, S. (ed.) Goat Science and Production. Wiley-Blackwell, Ames, IA, USA, pp. 39-53.

Shrestha, J.N.B. and E.S.E. Galal. 2011. Conservation of goat genetic resources. *Small Ruminant Research.*

Singh, S.N. and O.P.S. Sengar. 1990. Studies on the combining ability of desirable characters of important goat breeds. *Final Technical Report PL-480.* R.B.S. College, Bichpuri, Agra, India, pp. 217-267.

Singhal, K.K. and V.D. Mudgal. 1985. Influence of urea and single cell protein (SCP) as protein substitute on fatty acid composition of milk lipids in goats. *Indian Journal of Dairy Science,* **39**: 46-49.

Webb, E.G., N.H. Casey and L. Simela. 2005. Goat meat quality. *Small Ruminant Research,* **60**: 153-166.

Received on January, 2014, Revised on June, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 124-128, July-December, 2014

Women Empowerment through Technological Interventions in Ericulture: A Case Study in Upper Assam

Chinmayee Dash, S.A. Ahmed and K. Giridhar
Central Muga Eri Research & Training Institute, Central Silk Board, Lahdoigarh, Jorhat-785700, Assam

ABSTRACT

An action research was undertaken with Participatory Rural Appraisal (PRA) tools with a focus on analyzing women empowerment, drudgery reduction and sustainable resource utilization through technological inputs. Twenty women Self Help Groups (SHGs) were formed covering 405 women beneficiaries in three districts of upper Assam. The selected improved technologies in pre- and post cocoon sectors adopted through 10 numbers of technology demonstrations, 5 batches of training and skill development programme, awareness programme, constant field visits and supply of critical inputs like dfls (4400), disinfectants, seeds of host plant, low cost bamboo platform rearing equipments (90 Nos.), plastic mountages (90 Nos.), pedal cum motorized spinning machine (20 Nos.) and grainage tools. The average empty cocoon productivity was increased from 7.2 to 12.85 kg per 100 dfls (78.47% improvement over benchmark) with average shell weight from 0.29 to 0.49g. The yarn recovery improved from 67 to 82% on adoption of degumming technology and pedal cum motorized eri spinning machine. Drudgery of women reduced to a greater extent and production of yarn enhanced from 90 g (traditional *takli*) to 160-200g per 8 hours with spinning machine whereas the cropping intensity increased from 150 to 350%. Price realization of cocoon shell increased from Rs. 120-150 to Rs. 550 per kg. The average income of SHGs increased from Rs. 800-1000 to Rs. 8000-30000 per month during initial one year of intervention.

Keywords: Women empowerment, Eri silk, Livelihood, Technological intervention

INTRODUCTION

Sericulture in Assam is an agro based cottage industry. The scheduled tribes and rural households like commercially weakest section of the society are practicing ericulture to earn their livelihood. It is not an organized commercial activity as in the case of mulberry. Women constitute over 90% of those employed in down-stream activities of sericulture starting from host plant management, leaf harvesting and silkworm rearing (Ahmed, 2011). Even silk reeling and spinning (in case of *eri* silk) industry including weaving is largely supported by them. There is a huge gap between actual silk yields of 6 kg per 100 dfls in the Assam state in comparison to potential yield of 14 kg per 100 dfls due to low level of adoption of improved technologies in silkworm rearing practices, systematic host plant management, value addition and post-cocoon technologies. There is an immense scope to convert this sector into commercial part-time income generating venture among rural women of Assam. The present collaborative project between Department of Science & Technology, Govt. of India, New Delhi and Central Muga Eri Research & Training Institute, Central Silk Board, Lahdoigarh (host institute) has been undertaken since November 2012 to adopted latest improved technologies (both pre-cocoon and post-cocoon) through capacity building, demonstration, training/skill development, supply of critical inputs *etc.* Refinement of the technology is another dimension of the project based on local needs and availability of local resources to make farmers' friendly and trust worthy. In the globalized economy, competitiveness of the finished product at farm level is the major issue. To address this fact, work on product development and diversification, value addition in the post-cocoon as well as pre-cocoon sectors are being undertaken to enhance the profitability of the venture. The pre-pupa and pupa of the eri silkworm is the most favourite delicious protein food among the tribal population of North East. So, different recipes out of the pre-pupa have

been proposed for promotion among SHGs. The women SHGs had been motivated to develop enterprises with credit support from financial institutions and marketing support to make the project sustainable in long term.

MATERIALS AND METHODS

The present project is being carried out in the major eri growing districts of Assam i.e. Jorhat, Golaghat and Sivasagar. Due to large number of eri rearers, only women beneficiaries have been selected considering their major involvement (more than 90 %) in sericulture. The socio-economic survey conducted through semi-structured questionnaire and participatory discussion in the main eri growing villages and 20 villages have been identified and their pre-intervention socio-economic status documented for framing the common felt needs and specific intervention required. The constant field visits and awareness programme on the improved technologies were conducted to develop the social capital and accordingly 20 SHGs were formed with 15-25 members in each Self Help Group. Based on needs of the farmers, the technologies were identified for adoption.

On identification of interventions, arrangement of critical inputs of the technologies such as chemicals (disinfectants, soap, soda, fertilizers *etc.*), minor tools, disease free layings (dfls), *kharika*, bamboo platform rearing equipments, plastic mountages and pedal cum motorized eri spinning machines were distributed to SHGs. The technology demonstration and skill development/training programmes were conducted simultaneously.

On adoption of the selected technologies in integrated manner, productivity of the eri silk has been enhanced. The bamboo platform technology solved the problem of rearing space required for commercial rearing and cleaning. Through pedal cum motorized spinning machine productivity of yarn has been improved besides reduction of drudgery of women spinners. The pre-intervention value chain was eri silkworm rearing to cocoon/pupa production, which was converted in to silkworm rearing, Cocoon/Pupa production, Yarn/Fabric/Diversified Silk Products, retail/wholesale market. The SHGs was linked for credit support. The members have been trained for production of dfls for self-sustenance.

RESULTS AND DISCUSSION

Pre-*intervention socio-economic survey:* The three districts of Upper Assam i.e. Jorhat, Sivasagar and Golghat (un-divided Sivasagar district) were covered under the present project which falls under Upper Brahmaputra Valley Agro-climatic zone. The area is epicenter of muga and ericulture of the country. Most of the people are having excellent traditional knowledge and skills in rearing of muga and eri silkworm, reeling/ spinning and weaving, which has emerged as significant avenue for livelihood and women empowerment. The selected beneficiaries (N=405) practiced eri and mulberry sericulture and few of them from Cinatoli village of Golaghat, Hemlai area of Jorhat and

Broad areas	Specific technologies /methods/Intervention
Host plant management	(i) Systematic plantation of Castor Var. NBR-1 (ii) Perennial host plant management (Kesseru)
Rearing technologies	(i) Improved breed of eri silkworm (C2) (ii) Disinfection of rearing houses and appliances (iii) Bamboo Platform techniques for late age rearing (iv) Use of plastic mountage
Grainage technologies	(i) Seed cocoon preservation (ii) Mother moth examination for disease free layings (iii) Use of *kharika* for oviposition
Post-cocoon technology	(i) Improved method of degumming (ii) Pedal cum motorized eri spinning machines
Product development & diversification & marketing	(i) Eri silk product development & design (dyeing, knitting, weaving *etc.*) (ii) Food products of eri pupa (iii) Enterprise development/Formation of consortium (iv) Market & credit linkages

Particulars	Interventions
Socio-economic survey	25 villages in three districts covering > 550 farmers
Selection of beneficiaries	405 [Female-402; Male: 03]
Formation of SHGs	20 [Jorhat-10, Golaghat-5, Sivasagar-5]
Arrangement of critical inputs	Dfls supplied: 4400, Bamboo platform rearing equipment: 90 Collapsible plastic mountage: 90 Pedal cum motorized spinning machine:20 and Soap, wax paper, foam pad, Soda, Disinfectants, Kharika, castor seeds, *etc.*
Human Resource Development	Awareness Programme: 3 (254) Technology Demonstrations: 12 (226) Skill Development/training programme: 5 (205)

Dechangpani area of Sivasagar district practiced muga silkworm rearing. The average annual income from sericulture sector (eri silk) was Rs. 1797.85 on individual farmer basis. The average land holdings utilized for ericulture was 0.17 acre against 2.40 acres for other crops in the selected project villages. The cocoon benchmark data of eri cocoon production was 7.2 kg per 100 dfls with average single shell weight of 0.29 g. The yarn recovery (%) with traditional takli (spinning tool) wass 67.24%. No degumming chemicals were used except boiling the cocoon with hot water or soda. The majority of the target beneficiaries belonged to weaker section population i.e. OBC consisting of Ahom community (77.30%) followed by Scheduled tribe (19.20%) and Schedule caste (3.50%). Out of 405 beneficiaries selected for first year, 99.25 per cent were farm women. Out of selected beneficiaries, 13.1 per cent were illiterate and 14.3 per cent studied secondary level and above (Table 1).

Intervention Frameworks & Outcome: Besides supply of critical inputs, three awareness programmes

Table 1: Basic Profile of Selected Beneficiary Groups

Group No.	Age in years (%)			Caste (%)			Education level (%)			Experience of Sericulture in years (%)			
	<30	30-45	>45	SC	ST	OBC & others	Illiterate	Primary	Secondary & above	0-5	5-10	10-15	>15
1.	12.0	68.0	20.0	0.0	24.0	76.0	32.0	56.0	12.0	44.0	32.0	16.0	8.0
2.	10.0	65.0	25.0	5.0	20.0	75.0	24.0	66.0	10.0	20.0	35.0	25.0	20.0
3.	8.0	67.0	25.0	0.0	10.0	90.0	20.0	70.0	10.0	4.0	4.0	60.0	32.0
4.	10.0	70.0	20.0	0.0	15.0	85.0	16.0	60.0	24.0	0.0	15.0	65.0	20.0
5.	20.0	47.0	33.0	0.0	95.0	5.0	12.0	72.0	16.0	13.3	40.0	26.7	20.0
6.	0.0	70.0	30.0	0.0	45.0	55.0	10.0	70.0	20.0	0.0	75.0	20.0	5.0
7.	30.0	65.0	5.0	0.0	0.0	100.0	12.0	84.0	4.0	0.0	50.0	50.0	0.0
8.	25.0	40.0	35.0	0.0	0.0	100.0	5.0	85.0	10.0	0.0	50.0	45.0	5.0
9.	15.0	60.0	25.0	0.0	0.0	100.0	10.0	74.0	16.0	0.0	20.0	75.0	5.0
10.	10.0	55.0	35.0	0.0	0.0	100.0	8.0	80.0	12.0	5.0	25.0	70.0	0.0
11.	10.0	80.0	10.0	15.0	75.0	10.0	12.0	72.0	16.0	5.0	30.0	45.0	20.0
12.	0.0	70.0	30.0	0.0	100.0	0.0	12.0	76.0	12.0	0.0	10.0	45.0	45.0
13.	25.0	45.0	30.0	0.0	0.0	100.0	5.0	85.0	10.0	25.0	10.0	55.0	10.0
14.	10.0	60.0	30.0	20.0	0.0	80.0	12.0	83.0	5.0	0.0	70.0	30.0	0.0
15.	20.0	65.0	15.0	30.0	0.0	70.0	16.0	68.0	16.0	20.0	60.0	20.0	0.0
16.	20.0	60.0	20.0	0.0	0.0	100.0	12.0	68.0	20.0	0.0	40.0	45.0	15.0
17.	30.0	60.0	10.0	0.0	0.0	100.0	12.0	72.0	16.0	0.0	45.0	35.0	20.0
18.	35.0	65.0	0.0	0.0	0.0	100.0	10.0	70.0	20.0	0.0	70.0	30.0	0.0
19.	15.0	60.0	25.0	0.0	0.0	100.0	12.0	76.0	12.0	0.0	50.0	30.0	20.0
20.	20.0	70.0	10.0	0.0	0.0	100.0	10.0	66.0	24.0	0.0	65.0	25.0	10.0
	16.3	**62.1**	**21.7**	**3.5**	**19.2**	**77.3**	**13.1**	**72.7**	**14.3**	**6.8**	**39.8**	**40.6**	**12.8**

*Sample size of the study: No. of SHGs: 20, No. of Beneficiaries: 405, Data represents mean of 15-25 members of each group * Mean data represents average of 405 sample size.*

were organized in the project villages during February and July 2013 in association with CCS National Institute of Agricultural Marketing, Govt. of India, Jaipur and Central Muga Eri Research & Training Institute, Lahdoigarh and the beneficiaries were motivated to take up ericulture on commercial scale adopting improved technologies. Five batches of skill based training programmes were organized at project villages and 205 beneficiaries were trained at different aspects of ericulture (Table 2). The selected improved technologies were demonstrated to 226 farmers through twelve technology demonstration programmes (Table 3).

The data presented in Table 3 reveals that adoption of the improved technologies in ericulture (improved race, early stage rearing techniques, disinfection, platform rearing technology and plastic mountage etc.) had enhanced cocoon production from 7.20 to 12.85 kg per 100 dflsi.e. 78.74 per cent improvement over benchmark. The average single shell weight increased from 0.29 to 0.49 g. Spun silk recovery increased from 67.24 to 77.80 per cent because of adoption of improved degumming methods i.e. boiling of cocoon in washing soap and soda solution for 30 minutes. The boil off loss of eri shell reduced up to 27.76% through result demonstration conducted. The drudgery reduced to a greater extent through mechanization i.e. use of pedal cum motorized eri spinning instead of traditional *takli* and average yarn productivity enhanced up to 182 g per day.

The cropping intensity (i.e. number of eri silk crop reared per annum) enhanced from 202 to 415%. The farmers are rearing 3-6 crops in a year against 1-3 crops because of assured cocoon market and available value addition facilities i.e. spinning machines. The rearing

Table 2: Impact of training/Skill development programmes

Group No.	Av. Land holding (acre)		Eri rearing capcity (nos.of dfls/crop)		No. of eri crops per annum (No.)		Silk yarn recovery (%)		Average annual income from eri silk (Rs.)	
	Sericulture	Others	Pre-inter-vention	Post-inter-vention	Pre-inter-vention	Post-inter-vention	Pre-inter-vention	Post-inter-vention	Pre-inter-vention	Post-inter-vention
1.	0.20	1.98	8.2	25.0	2.1	4.5	60.70	81.00	2340.00	9802.00
2.	0.15	1.45	7.8	18.0	1.8	3.6	66.70	76.00	1235.00	8050.00
3.	0.15	2.50	9.5	27.0	2.3	5.2	67.50	82.00	1624.00	9500.00
4.	0.19	2.62	12.1	27.0	2.5	5.6	69.60	78.00	1750.00	14021.00
5.	0.20	3.15	12.3	19.0	2.0	3.4	68.90	75.00	3287.00	7845.00
6.	0.21	2.78	12.0	35.0	1.8	5.2	68.00	78.00	1895.00	8955.00
7.	0.15	2.79	10.8	24.0	1.7	4.5	67.90	77.00	1285.00	7682.00
8.	0.15	1.88	10.1	20.0	2.4	4.0	69.00	84.00	2053.00	6974.00
9.	0.14	2.23	11.7	21.0	2.8	4.0	68.00	76.00	1835.00	8836.00
10.	0.11	2.72	7.5	25.0	2.1	4.5	66.28	71.00	1415.00	7860.00
11.	0.21	2.64	13.9	24.0	2.6	4.0	67.07	81.00	2156.00	8580.00
12.	0.21	2.56	8.8	30.0	1.4	3.5	66.36	79.00	1843.00	6845.00
13.	0.19	2.42	9.3	26.0	2.1	4.5	65.42	82.00	784.00	12045.00
14.	0.15	2.13	9.1	24.0	2.2	3.5	67.28	78.00	1185.00	6542.00
15.	0.17	2.56	10.0	25.0	2.1	3.5	67.00	79.00	1365.00	5462.00
16.	0.22	2.44	9.4	26.0	2.4	4.0	67.46	72.00	1524.00	6840.00
17.	0.11	2.00	9.5	24.0	2.5	3.5	68.15	78.00	2042.00	5479.00
18.	0.21	2.07	10.4	29.0	1.2	4.5	68.30	76.00	1845.00	7865.00
19.	0.12	2.70	9.0	18.0	1.3	4.0	67.38	78.00	2294.00	4568.00
20.	0.13	2.40	8.9	19.0	1.3	3.5	67.81	75.00	2200.00	3287.00
	0.17	**2.40**	**10.01**	**24.30**	**2.02**	**4.15**	**67.24**	**77.80**	**1797.85**	**7851.90**

*Sample size of the study: No. of SHGs: 20, No. of Beneficiaries: 405, Data represents mean of 15-25 members of each group * Mean data represents average of 405 sample size.*

Table 3: Improvement in economic parameters of eri silk production during post-intervention period

Parameters	Pre-intervention	Post-intervention	Improvement (%)
Single cocoon wt. (g)	2.85	3.62	27.02
Single shell wt. (g)	0.29	0.49	68.96
Shell ratio (%)	10.17	13.42	31.96
Cocoon harvested/dfl (Nos.)	248	262	5.65
Av. cocoon yield/100 dfls (kg)	7.20	12.85	78.74
Boil off Loss (%)	17.65	12.75	(-) 27.76
Spun silk recovery (%)	67.24	77.80	15.71
Waste (%)	4.52	2.23	(-)50.66
Yarn production /8 hrs (g)	90 (Traditional Takli)	182 (Spinning machine)	102.22
Cropping intensity (%)	202	415	105.44
Cocoon price (Rs. per kg)	120	550	358.33

capacity of farmers i.e. numbers of dfls reared per crop increased from 10.01 to 24.30. The cocoon price increased from Rs. 120 to Rs. 500-600 per kg due to better market linkages. The average annual income on individual eri rearer basis from eri silk increased from Rs.1797.85 to 7815.90 (Table 5). The improved variety of castor NBR-1 introduced in the field level with package of practices and leaf yield increased from 8 to 10.5 MT/ha**.**

Ecological benefits: The project also emphasized on utilization of the local natural resources in sustainable manner for maximum benefits of the end user *i.e.* women eri silkworm rearers. The bamboo is readily available in North eastern states and in the present project areas. The major reason for non-commercialization of this venture was lack of sufficient space/house for large scale rearing. Further, cleaning takes lots of time, which was difficult for a housewife. So, on adoption of this low cost rearing equipment, women were able to rear eri silkworm on a large scale (100 dfls) in a limited space of 12 ft x 10 ft without wasting much time in cleaning. The waste/ litters collected through this equipment were recycled for production of organic manure. As a process of continual improvement through refinement, the structure was fitted with nylon net for management of uzifly infestation.

CONCLUSION

The initiative emerged as a unique Action Research Project as far as Ericulture in North Eastern Region focusing women empowerment is concerned. It become one of the distinctive sustainable models due to motivating the farmers on constant basis. Further, the beneficiaries were made pro-active through dovetailing of the programmes of other departments/agencies such as Integrated Skill Development Programme (ISDS) of CMER&TI, Central Silk Board and 25 beneficiaries were trained during 2013-14. The outcome of the project revealed that Participatory Group Approach among women was the most successful model for adoption of integrated technologies for women empowerment and ensuring sustainable livelihood security to women eri silk rearers.

ACKNOWLEDGEMENT

The authors are grateful to SEED Division, Department of Science & Technology, Govt. of India, New Delhi for providing financial assistance under Women Scientist Fellowship (WOS-B) scheme.

REFERENCE

Ahmed, S.A. and R.K. Rajan. 2011. Exploration of *vanya* silk biodiversity in North Eastern Region of India: Sustainable livelihood and poverty alleviation. Proceedings of International Conference on Management, Economics and Social Sciences (ICMESS'2011), December 23-24, 2011 at Bangkok, Thailand, pp. 485-489.

Received on January, 2014, Revised on August, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 129-133, July-December, 2014

Comparative Assessment of Seed Delivery System in Patiala District of Punjab

Rahul Gajbhiye, M.S. Nain, Premlata Singh, S.K. Dubey and J.P. Sharma
Division of Agricultural Extension, IARI, New Delhi-110012

ABSTRACT

The study examines the effectiveness of the seed delivery by different stakeholders in Patiala District of Punjab state. The study was conducted on 120 respondents selected randomly from four villages of two blocks of the selected district. The study revealed that among the three major stakeholders in delivery of seed, the NGO was found the most effective with the mean percentage score of 73.72 and the farmers were satisfied with the quality as well cost of the seed supplied through NGO. Majority of the farmers reported that the cost of the seed supplied by the private agencies having percentage mean score of 70.66 was very high but were satisfied with the quality of seeds supplied. Farmers responded favourably with the overall seed supply system of state government with average percentage mean score of 65.66 but were less satisfied with the quality of the seed supplied by them.

Keywords: Seed-supply, Effectiveness, Availability, Accessibility, Quality, Timeliness, Cost

INTRODUCTION

Seed is the most vital and critical input in agriculture on which the efficacy of other agricultural inputs depends. Seed acts as a catalyst in agricultural production. Quality seed can play a critical role in increasing agricultural productivity and thus food security as well as farmers' incomes. In agriculture high yielding varieties has contributed maximum in enhancing production (Raghav, 2013). The seed sector has made impressive progress over the last three decades. There has been a steadily increase in the quality of seeds produced over years. Seed replacement rates in key crops like rice and wheat are reported extremely low in most parts of India (in case of Punjab, SRR of paddy is 52 percent and of wheat is 39 percent, in 2011-12 as per Govt. of Punjab) which can be attributed to many factors like, lack of awareness of the potential of new varieties; lack of proper seed storage infrastructure to maintain good quality; poor linkages amongst government, private sector and farmers to provide seeds in a timely manner and a lack of a policy environment that will support faster adoption of new varieties. Some of the concerns that need to be addressed in this sector include the farmers' preferences towards old but popular varieties, accessibility of seed markets by the farmers, bridging the gap between demand and supply, better-targeting subsidies on seeds, improved storage infrastructure, the policy environment and stronger extension systems to increase farmers' accessibility and adoption of improved seed varieties. In spite of several agencies serving the seed demand of farmers, they are still in the need of reliable and dependable sources of seed supply.

Government agencies have failed miserably in providing the whole rainbow of services to the farmers obviously due to the lack of funds and dedicated manpower. Also the majority of the farmers are unable to avail the costly services and products of private agricultural enterprises. Anandajayasekeram *et al.* (2008) emphasized the need for a pluralistic extension system, consisting of services from the public sector, non-governmental sector and the private sector. The main reason of developing a pluralistic service is a need to find a suitable 'mix' of public and private funding and delivery mechanisms for extension, which will achieve differing agricultural goals and serve diverse target populations. Government organizations and NGOs must change from using production figures as sole targets for their planning and instead focus on how they can help private actors function as market players (Lilleso *et al.,* 2011). David (2003) advocated the proliferation of

NGO and research support to local rural level seed production and dissemination activities. These activities have a wide range of objectives including improved dissemination of modern varieties, preserving genetic diversity and quality, improving seed availability and reducing the cost of seed and dependence on external sources. The Non-Government Organizations (NGOs) strive to propose the required solutions for some of the lacunas inherent in public and private seed delivery system to the farmers.

Farmers need to know about the options for seed supply, the quality of the seed provided, and the characteristics of the varieties that are available. Seed enterprises require information on farmers' requirements and on the potential partners in seed provision. The elements of seed provision are variety development, provision of source seed, multiplication, conditioning and distribution of commercial seed, seed quality control and variety promotion. With the zeal to serve the farming community NGOs are emerging as the deciding force. The Young Farmers Association (YFA) an Non-Governmental Organization (NGO) with its headquarter at Patiala, Punjab has collaborated with the leading research organization, Indian Agricultural Research Institute (IARI), for technical and research backstopping, have its own farm for multiplication of IARI released varieties, monthly publication namely 'Young Farmer' in local language (Punjabi) for information dissemination and the biannual *kisan mela* for variety promotion. The state government has its own well developed system of seed multiplication to its dissemination and similar is true for private sector seed suppliers. The present study was undertaken to analyse the perceptions of the farmers regarding the seed delivery system of government, private and one of the premier Non-Governmental Organisation (Young Farmers Association) in the state of Punjab.

MATERIALS AND METHODS

An exploratory research design was used for conducting the study in purposively selected Patiala district of Punjab, India. From the selected district, two blocks namely *Nabha* and *Ghanaur* were selected randomly. From each selected blocks two villages were selected randomly. A sum of 30 farmers was selected randomly from the each selected villages making total of 120 respondents. A pre-tested interview schedule was used to collect the data from respondents. Three major stakeholders for delivery of seed viz. Government agencies, Private agencies and Non-government agencies were identified through a preliminary study. Effectiveness for the deliveries of seed by the stakeholders were compared on five dimensions namely availability, accessibility, timeliness, quality and cost. The dimensions for effectiveness were assessed using a Likert type five point continuum. An effectiveness index was developed for assessing the overall effectiveness for the delivery of seed. Descriptive statistics namely mean and percentage were used to analyze the data using SPSS.

RESULTS AND DISCUSSION

Table 1 shows the perception of farmers regarding on various aspects of three systems actively involved in seed delivery for the agricultural production in Punjab state of India. It is clear from the table that the seeds availability was reported to be low by 4.1 per cent of farmers from Government Organizations (GOs), 6.0 per cent by Private Organizations (POs) and 13.3 per cent by Non-Governmental Organizations (NGOs), whereas 41.6 per cent for GO, 45.8 per cent for private and 40.0 per cent for NGO reported it to be very high. Majority of the respondents reported the availability at all three systems to be medium to high level, however, none of the respondent reported to be very low. The results supports the study of Rohrbach and Kiala (2007) where the seed provided by World Vision and other NGOs almost undoubtedly speeded the recovery of agricultural production in Mozambique, allowing recipients to plant larger areas.

The accessibility of seed through private agencies was rated high by majority of respondents (70.8 per cent) followed by very high (20.3 per cent) and medium (8.3 per cent) whereas for GOs it was rated high by 41.6 per cent, very high by 29.1 per cent, medium by 25.0 per cent and low by 4.1 per cent of respondents. For NGO the majority (66 per cent) rated it as highly accessible followed by equal percentage in very high and medium categories (16.6 per cent). In overall all the three systems very rated highly accessible with a mean of 72.5, 70.0 and 69.1 for PA, NGO and GO respectively. The finding of high accessibility possessed by the NGOs (70 per cent) by many reviews concluding that NGOs can increase the availability and accessibility of the seed not only as a mediator in dissemination but also by facilitating small-scale local seed production (Wiggins and Cromwell, 1995; Tripp, 1994; Gisselquist 1996; Cromwell, 1992).

Table 1: Farmers perception on Seed supply system of different agencies (n=120)

Category	Availability			Accessibility			Quality			Timeliness			Cost		
	GO	PO	NGO	GO	PO	NGO	GO	PO	NGO	GO	PO	NGO	GO	PO	NGO
Very low(0-20)	-	-	-	-	-	-	15 (12.5)	-	-	-	-	-	-	15 (12.5)	-
Low (21-40)	5 (4.1)	8 (6.0)	16 (13.3)	5 (4.1)	-	-	30 (25)	-	-	27 (22.5)	10 (8.3)	-	-	20 (16.6)	-
Medium (41-60)	30 (25)	20 (16.6)	16 (13.3)	30 (25)	10 (8.3)	20 (16.6)	60 (50)	30 (25)	-	25 (20.8)	10 (8.3)	10 (8.3)	-	25 (20.8)	36 (30)
High (61-80)	35(29.1)	42 (35)	40 (33)	50 (41.6)	85 (70.8)	80 (66)	15 (12.5)	20 (16.6)	32 (26.6)	28 (23.3)	30 (25.0)	35 (29.1)	50 (41.6)	60 (50.05)	84 (70)
Very high (81-100)	50 (41.6)	55 (45.8)	48 (40)	35 (29.1)	25 (20.3)	20 (16.6)	-	70 (58.3)	88 (73.3)	40 (33.3)	70 (58.3)	75 (62.5)	70 (58.3)	-	-
Mean	71.6	76.0	70.0	69.1	72.5	70	42.5	76.6	84.6	63.5	76.6	80.0	81.6	51.6	64.0

So, the introduction of entrepreneurship in seed production and marketing could be an excellent step towards bringing the accessibility of the seed to the level of highly accessible to the farmers.

The perceived quality of the seed supplied by Government organization (GO) was medium by majority of the farmers (50 per cent) followed by high and very low by 12.5 per cent whereas it was reported very high by (58.3 per cent) followed by medium by (25.0 per cent) and high by (16.6 per cent) for private supply system. In case of selected NGO it was reported to be very high (73.3 per cent) and high (26.7 per cent). In overall the seed quality was rated very high for NGO (mean score 84.6), high for Private (76.6 mean score) and medium (42.5 mean score) for government seed supply system. The reason may be the advantage of NGOs and community-based organizations in a seed system is that they are not driven entirely by profit, the way seed companies are most of them such as through microfinance. This finding is in line with Danielsen *et al*., (2005) who reported that through Poverty Elimination Through Rice Research Assistance (PETRRA), (an experiment in pro-poor agricultural research funded by DFID and managed by IRRI), new kinds of actors successfully rose to the challenge of helping smallholders grow and sell quality rice seed to other poor farmers by making best use of existing institutional systems in Bangladesh. Improved technical, business and organizational skills, with effective public-private partnerships allowed enthusiastic, open-minded people to build sustainable, demand-driven seed supply systems.

The timeliness of the seed supply was rated high for Government (63.5 mean score) and private (76.6 mean score) whereas it was very high for NGO (80.0 mean score). Majority of farmers for NGO (62.5 per cent) and private (58.3 per cent) and maximum number for government (33.3 per cent) reported it to be highly timely, whereas 22.5 per cent farmers and 8.3 per cent farmers reported low timeliness for government and private sector seed system, respectively. This may be due to the reasons that the seed supplied by selected NGO is at the time of *kisan mela* being organized well in advance of the both the cropping seasons and also due to the timely dissemination of information about the seed varieties by NGO through its magazine named *Young Farmer* and on field demonstration of the new varieties.

This finding is strengthened by the result of study conducted by Garai *et al.* (2013) who found in her study of Information Sources Utilized by the Self Help Group members that among all the sources of information, NGO/facilitator were the main sources of information of the SHG member.

As far as cost is concerned it was reported to be very highly economic (81.6 mean score) for government agencies, highly economic (64 mean score) for NGO and medium economic (51.6 mean score) for private supply system. High cost was one of the important impeding factors for the farmers which prevent the farmers from opting for seeds through NGO and Government agencies. This finding was supported by the findings of Ranawat *et al.* (2013) who found that high cost was a constraint to the adoption of improved maize seed. The government agencies were the cheapest source of seeds in the area. This may be due to the reason that the subsidies on seed are applicable to the government system only and the private organizations work for the profit, whereas the selected NGO works on not for profit basis. But the cost incurred on seed production is comparatively high and there were no provision of subsidies from state or central government for the seed produced and supplied by the selected NGO.

The four parameters namely availability, accessibility, quality and timeliness with respect to the NGO was found to be highly satisfactory by the respondents. Due to the stiff competition in the market private agencies were laying the importance on quality of the seed delivered, for which farmers were opting them. The only impeding factor was the cost of seeds, which was found to be higher as compared to other seed agencies. Availability and accessibility of the seeds from the NGO was found to be satisfactory. The quality of the seeds supplied by the NGO was found to be highest which was the most important parameter for the viability of the seed. Also the cost of the seeds supplies was low because for their 'not for profit' orientation which enable to deliver the seed at the lower prices which become a major factor of effectiveness of seed delivery system to the farmers. Both Private Agencies and Government Agencies fared well as compared to NGO in terms of availability because of low scale of production of seeds in NGO. Accessibility of seeds was ranked second at NGO. Farmers perceived the quality as the highest among the three entities. Timeliness was highest at NGO because members farmers of NGO are the exclusively first to get the seeds of IARI at *Rakhra* farm. In terms of cost NGO fared second.

Table 2: Effectiveness of seed delivery systems of different agencies

Agency	Effectiveness score
NGO	73.72
PA	70.66
GA	65.66

Table 2 shows that the NGO was found to be most effective with the score of 73.72 which was because of the fact that farmers were satisfied with almost all the factors of assessment. Private agencies were found to have the effectiveness score of 70.66. Government agencies were found to have the effectiveness score of 65.66. Therefore NGO can play an important role on the delivery of seed. In an attempt to improve the research extension-farmer linkages, countries must apply a number of approaches. All the stakeholders viz. research institutes, extension organisations, farmers and government need to play their respective roles to bridge this gap for the overall development of the agriculture sector (Kaur *et al.,* 2013) .

CONCLUSION

The study found that farmers were purchasing seeds from different sources. The overall effectiveness of NGO was found to be highest with the score of 73.72. The above results show the advantages of engaging the NGOs in the seed delivery mechanism to the farmers. The gaps in activities ranging from variety development to seed production and quality assurance are determined largely by the level of technology and the availability of requisite expertise. It was noted that the technology backstopping was provided by premier research institution in its flagship partnership programme with NGOs of the country than also technologies available for conditioning and storage were limited for several reasons, including cost of equipment, availability of local expertise as well as facilitative policy and legislation that constrains the collaborative participation of the Non-Governmental Organization and public sector in the seed delivery system. Also it needs to enhance the capacity of the NGOs financially and strategically so as to make them more capable to serve the needs of the much

deserving farmer community. Strengthening seed promotion programmes and implementation of efficient methods to improve farmers' and seed producers' knowledge and skills related to varieties and seeds is the need of the hour.

REFERENCES

Anandajayasekeram, P., R. Puskur, S. Workneh, D. Hoekstra. 2008. Concepts and practices in agricultural extension in developing countries: A source book. IFPRI (International Food Policy Research Institute), Washington, DC, USA, and ILRI (International Livestock Research Institute), Nairobi, Kenya.

Cromwell, E. 1992. Supporting Community-Level Seed Production. *Appropriate Technology,* **18**: 4.

Danielsen, S., B.M. Khairul and M. Holderness. 2005. *Innovations in seed systems.* Bangladesh

David, S. 2003. Farmers seed enterprise: a Sustainable Approach to Seed Delivery. Economic methodology applied in Ethiopia, ESA technical paper. Agricultural and Development Economics Division, Food and Agricultural Organization. 32p.

Garai S, G. Mazumder and S. Maiti. 2013. Information Sources Utilized by the Self Help Group members of New Alluvial Zone of West Bengal. *Journal of Community Mobilization and Sustainable Development,* **8**(1): 64-68.

Gisselquist, D. 1996. Toward a Competitive and Modern Seed Industry for Farmers in Southern Africa. Consultant Report. Washington, D.C.: The World Bank.

Kaur, M., R.Kaur and V. Gupta. 2013. A Theoretical Perspective on Research-Extension-Farmer Linkages *Journal of Community Mobilization and Sustainable Development*, **8**(2): 193-201.

Lilleso, J.B.L., L. Graudal, S. Moestrup, E. D. Kjaer, R. Kindt, A. Mbora, I. Dawson, J. Muriuki, A. Raebild and R. Jamnadass. 2011. Innovation in input supply systems in smallholder agroforestry: seed sources, supply chains and support systems *Agroforest Syst.,* **83**: 347–359.

Raghav, D.K., R.K. Singh, A.K. Singh, and P.B. Saha. 2013. Sustainable Livelihood Security of Tribal farmers Through HYV of Paddy in Dumka District of Santhal Pargana, Jharkhand. *Journal of Community Mobilization and Sustainable Development,* **8**(2): 285-287.

Ranawat, Y., R.P. Mahadik and S.S. Sisodia. 2013. Problems Faced By Maize Growers of Udaipur District. *Journal of Community Mobilization and Sustainable Development,* **8**(1): 84-89.

Rohrbach, D. and D. Kiala. 2007. Development Options for Local Seed Systems in Mozambique, SAT eJournal | ejournal.icrisat.org

Seed Replacement Rate, Department of agriculture, Government of Punjab. Agripb.gov.in/high_yielding_variety/pdf/SEEDS.pdf

Tripp, R. 1994. Proximity is Plus: The Economics of Farmer Seed Production and Distribution in Developing Countries. In Seed Production by Smallholder Farmers: Proceedings of the ILCA/ICARDA Research Planning Workshop held in ILCA, Addis Ababa, Ethiopia, 13-15 June 1994, ed. J. Hanson. Addis Ababa: ILCA.

Wiggins, Steven, and E. Cromwell.1995. NGOs and Seed Provision to Smallholders in Developing Countries. *World Development,* **23**(3): 413-422.

Received on January, 2014, Revised on August, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 134-139, July-December, 2014

Economic Feasibility of Rejuvenation Technology in Litchi for Enhancing Quality Fruit Production and Sustainability

Rajesh Kumar
National Research Centre on Litchi, Muzaffarpur-842002, Bihar

ABSTRACT

The invasive rejuvenation technology for old senile fruit trees, particularly in litchi presents many cross cutting issues on the theme of restoration of youthful vigour, enhancement of quantum of quality fruit production, period of sustainability and above all the economic feasibility. An on-site study was conducted by NRC on Litchi, Muzaffarpur, Bihar during the year 2007-08 to 2011-12 at the farmers field in five locations (5 districts of Bihar). The initial level topping off at the height of 2.5 m was done. The calculated cost of reiterative pruning (very vital and important operation requires utmost care, skill and attention) at all the five locations found to be varying from Rs. 52000 to 63000. The total cost included the thinning and framing of the branches, canopy re-building and intercrop production (open space created) every year. The orchardist remained associated in this operation and compilation (information). The mean of the management cost have been taken into account for calculation of cost : benefit ratio, found to giving an increasing trend, without any economic loss to the growers. The treatment-wise quantum of quality production, as categorized under codex standard showed an increase from 19.25% (un-rejuvenated) to 42.78% (rejuvenated at 2.5 m height) under Extra-class. The conduct of entire technological operations ventured success story through transformation of unproductive to productive ones with successive year-wise increase in quantum of quality production in commercially viable way in sustainable manner.

Keywords: Rejuvenation, Reiterative pruning, Invasive, Economic feasibility, Sustainability, Productivity

INTRODUCTION

Litchi is an important evergreen commercial fruit crop of India and it is associated with livelihood security of many farmers in growing regions. The lack of care and maintenance of litchi orchards, attaining age leading to senility and phase of declining productivity. Make them unproductive and economically un-viable. At present, there is considerable area under old senile unproductive litchi orchards (25-30%). Uprooting the existing one and go for new plantation is merely a long term venture. The rejuvenation of old senile litchi fruit trees present many cross cutting issues like restoration of youthful vigour, enhancement of quantum and quality fruit production, period of sustainability and economic feasibility etc. All these require sound experimentation, implementation and success stories. Until now all but little efforts existed in the way of survivability of declining unproductive orchard trees and efforts to boost the level of adoption of rejuvenation technology. The rejuvenation technology is unique integration of invasive exhaustive operations and skilful management for real desired transformation by bringing back the productive potential of quality fruit production. Hence the systematic study of rejuvenation technology is undertaken to answer the issues of suitability, sustainability, productivity and economic feasibility.

MATERIALS AND METHODS

The present study conducted by National Research Centre on Litchi at farmers during five years (2007-08 to 2011-12) at five different locations (I-Muzaffarpur, II-Samastipur, III-Vaishali, IV-East Champaran and V-West Champaran districts) at farmers field having one hectare area orchard each at each location. The proper selection of old senile orchards and convincing the growers to go for the implementation of rejuvenation technology was exercised properly along with the training for operation of reiterative pruning, orchard floor management and canopy rebuilding at the initial year of start (2007-08). The pertaining data for the entire

operational cost, activities performed right from initial stage up to the fruiting stage till the treated trees started giving quantum of quality fruit production were recorded. At two locations the total manpower involved along with operational costs were taken into account (which included 80 man-days @ 175.00/head and 45 skilled man-days @ 196.00/head), while in other locations contract basis were adopted. The reiterative pruning in phase manner was done to top off the tree up to the height of 2.5 m from the ground level. The operational cost of the technology calculated under the major heads like; Charges for reiterative pruning in phase manner, Cost of cleaning, ploughing and levelling of the orchard floor, Cost of manures and fertilizers and also its application cost; Cost of irrigation (3 irrigations each of 6 hours @ 250/hr), Cost of chemical pasting and spraying (including man-days), Cost of thinning and light pruning operations, Cost of intercropping and Miscellaneous operation (hiring different types of pruning saw, blade, rope, bamboo pieces, tractor trolley and rickshaw etc.) charges. Year wise income generated through various heads like; Sale of fruits before rejuvenation (first year), Sale of woods obtained after reiterative pruning (1st year only), Profit from intercrops and Finally sale of quality fruits bearing started after 3rd year onwards were carefully taken into account for economics. The total five litchi based intercropping system were established viz., litchi + *toria*/mustard, litchi+Elephant foot yam (Ol) + *toria*, litchi + *kharif* and *rabi* maize, litchi+ turmeric + *toria* and litchi + blackgram + *toria* were tried year wise at all the locations. The tabular analysis of the data pertaining to operational cost and income generated were estimated to calculate benefit : cost ratio and also to know the economic feasibility.

RESULTS AND DISCUSSION

For the successful translation of the rejuvenation technology in old senile orchards the sequential operational steps followed in scientific manner at all the five location. The reiterative pruning of old senile (unproductive) trees at the certain effective height of 2.5 meters depending upon the nature and growth of the tree's with the sole (manual) as well as proper integration of manpower and machines/tools at different locations. As per the recommended operational steps, the major invasive part, the reiterative pruning was done with proper care and attention at all the locations (Kumar, 2008). To avoid any external infection at the cut portion, it was pasted with Bordeaux mixture or Copper-oxy-chloride (Blitox) immediately after pruning at all the treated trees (Bal, 2006). The location wise operations performed have been properly monitored scientifically and made this event a data base. The cost incurred in the technology operations at different location by the farmer is presented in Table 1. The perusal of the Table 1, give an account of the all the operational cost of the technology at grower's orchard including cost of orchard floor management just after undergoing all the operations at various locations during 2007-08. The real cost of operating this rejuvenation technology ranged from Rs. 52000.00 (at location IV) to 63000.00 (at location V) on per hectare basis including the cost of reiterative pruning in phase manner and orchard floor maintenance, which accounted for irrigation and nutrient application and other required operations. The location wise variation existed due to skill, efficiency and expertise of the manpower involved during the operation (Kumar and Nain, 2012).

The cost incurred in the technology operation and level of income obtained in five consecutive years (2008-09 to 2012-13) have been put in Table 2, provided the basis for the business profile. The intercropping results have been found more location specific, (as the basis of the changes at district level through the information based on the suggested pattern). After a month later, the first intercrop as mustard (2007-08) have given very high yield and income as sale proceeds. The very next year (2008-09), growing of Elephant foot yam as intercrop has been found very rewarding and profitable even at all the locations, more particularly at location I (Muzaffarpur) and location III (Vaishali district). The high yielding varieties of both *kharif* and *rabi* maize have been taken at locations during the year 2009-10, have also found profitable. Among other intercrops, turmeric have been also found giving good results during the fourth year (2010-11). Interspaces put under blackgram and later the crop of mustard have been found profitable under minimum care and attention during the year 2011-12. The intercropping have been found characteristics of specific location (choice and changes at the district level) and provided additional income and contributed in a way to reduce the payback period of yield loss due to rejuvenation treatments (Rathore *et al.*, 2014). The

Table 1: Cost of operation of reiterative pruning and orchard floor management under rejuvenation technology (1 ha) in old senile unproductive litchi orchard (1 ha) at various locations during 2007-08

Operations	Location-I	Location-II	Location-III	Location-IV	Location-V
Charges for reiterative pruning in phase manner.	24,500.00	22,200.00	25,400.00	22,500.00	30,000.00
Cost of cleaning, ploughing and levelling of the orchard floor	3,500.00	2,800.00	3,600.00	3,500.00	4,000.00
Cost of manures and fertilizers	5,600.00	5,600.00	6,000.00	5,600.00	5,600.00
Cost of application of manures and fertilizer through ring method	2,500.00	2,000.00	2,000.00	2,500.00	2,500.00
Cost of irrigation (3 irrigations each of 6 hours @ 250/hr	4,500.00	—	—	2,500.00	2,500.00
Cost of chemical pasting and spraying (including man-days)	3,750.00	4,000.00	3,500.00	3,500.00	4,000.00
Cost of thinning and other operations	12,500.00	15000.00	12,500.00	10,000.00	10,000.00
Miscellaneous operation (hiring different types of pruning saw, blade, rope, bamboo pieces, tractor trolley and rickshaw etc.)	2,400.00	4,400.00	4,900.00	4,400.00	4,500.00
Total	**59,000.00**	**56,000.00**	**55,000.00**	**52,000.00**	**63,000.00**

(I-Muzaffarpur, II-Samastipur, III-Vaishali, IV-East Champaran & V-West Champaran)

Table 2: Economics of rejuvenation technology operation in old senile litchi orchards (one hectare) at various locations during five consecutive years (2008-09 to 2012-13)

Items/particulars of operations	Location-I	Location-II	Location-III	Location-IV	Location-V
Year 2007-08					
Sale of fruits before rejuvenation	15,500.00	5000.00	5000.00	10000.00	2500.00
Cost of Rejuvenation	(-) 59,000.00	(-) 56,000.00	(-) 55,000.00	(-) 52,000.00	(-) 63,000.00
Sale of woods	2,75,000.00	1,50,000.00	2,50,000.00	75,000.00	60,000.00
Cost of Intercropping	(-)8,000.00	(-)8,000.00	(-)7,500.00	(-)7,500.00	(-)7,500.00
Profit from Intercrops	32,200.00	29,000.00	30,000.00	31,000.00	28,000.00
Gross Income	2,55,700.00	1,20,000.00	2,22,500.00	56,500.00	20,000.00
Year 2008-09					
Cost of Intercropping	(-)45,500.00	(-)45,500.00	(-)45,500.00	(-)45,500.00	(-)45,500.00
Profit from Intercrops	1,08,000.00	90,000.00	75,000.00	88,000.00	75,000.00
Gross Income	62,500.00	44,500.00	30,500.00	42,500.00	30,500.00
Year 2009-10					
Cost of Intercropping	(-)23,500.00	(-)23,500.00	(-)23,500.00	(-)23,500.00	(-)23,500.00
Profit from Intercrops	61,000.00	42,000.00	54,500.00	40,000.00	47,500.00
Gross Income	37,500.00	18,500.00	31,000.00	26,500.00	24,000.00
Year 2010-11					
Cost of Intercropping	(-)21,000.00	(-)21,000.00	(-)21,000.00	(-)21,000.00	(-)21,000.00
Profit from Intercrops	56,000.00	50,000.00	56,000.00	55,000.00	52,000.00
Sale of fruits from rejuvenated trees (excluding cost of harvesting)	26,500.00	23,000.00	20,500.00	21,000.00	20,000.00
Gross Income	61,500.00	52,000.00	55,500.00	55,000.00	51,000.00
Year 2011-12					
Cost of Intercropping	(-)17,000.00	(-)17,000.00	(-)17,000.00	(-)17,000.00	(-)17,000.00
Profit from Intercrops	47,000.00	40,000.00	32,000.00	28,000.00	27,000.00
Sale of fruits from rejuvenated trees	65,500.00	39,000.00	40,000.00	45,000.00	31,000.00
Gross Income	95,000.00	62,000.00	55,000.00	56,000.00	41,000.00

variation in yield level and income from intercrops have been found dependent on grower's attitude and found varying due to the extent of application of nutrition, irrigation, plant protection measures to the treated trees and intercrops as the basis of orchard floor management in successive years at all the locations. The cost of intercropping found dependent on the choice of crop and the profit there of from that category.

The fruit bearingstarted (in all the rejuvenated trees, at all the locations) after a gap period of two years. Maturity period is found to be slightly delayed in rejuvenated trees compared to un-rejuvenated trees. Fruit yield in the 3rd year and onwards i.e., for two more years (2010-11 and 2011-12) were recorded (Table 3). The quality categorization of fruit yield clearly indicated the considerable increase in quantum of quality production under the grades of extra class and class-I and very less under inferior category and less wastage. The rejuvenated trees have shown the enhanced quantum of quality production at all the locations. Further, the categorization of fruit yield under different quality class revealed high percentage under extra class and class I as compared to un-pruned trees (Table 4). The quantum of quality fruit yield increased with increasing trend every year onwards after the start of fruit bearing in rejuvenated trees, which is found in agreement with the findings of Kumar (2008). Table 3 revealed that the quality fruit yield under the category of extra class and class –I increased almost two to three times compared to control (i.e., un-pruned old senile trees).

Calculated benefit : cost ratio of rejuvenation technology: Table 4 showed a wide variation at both the levels i.e., year-wise and location-wise, was clearly distinct. The trend of benefit : cost ratio of rejuvenation technology treatments at different locations calculated year wise for all the five years (2007-08 to 2011-12) have clearly showed that the income gain of the growers have not been affected negatively even after the implementation of invasive rejuvenation pruning operation, though the fruit yield loss was for a period gap of two years. The benefit : cost ratio was higher at the beginning of the operation and then it has increased year-wise with increasing trend at all the locations. The business case framed by the sale of woods, income of intercrops produce and sale due to quantum of quality production from the third year onwards, provided a description of the actual values for making valid recommendations for wider adoption of this economically viable technology. The successful translation of this invasive technology in strategically planned manner in a profitable way satisfies the varied issues of conservation, enhancing land use efficiency and quality fruit production in profitable and sustainable manner.

CONCLUSION

The findings of this economic feasibility study, clearly showed the beneficial outcome of the particular rejuvenation technology in an economically viable way, when comparative analysis made after taking into consideration the benefits and costs of the technology operation/implementation. The enhanced level of quality fruit production and increased benefit cost ratio provided better avenues for wider and successful adoption of the technology. The basis of the economic viability of this invasive nature of rejuvenation technology found highly beneficial, economically feasible and with the only viable option to go for

Table 3: Cost of reiterative pruning for topping off and economics of rejuvenation technology including mean values year-wise and location-wise

	Location-I	Location-II	Location-III	Location-IV	Location-V	Average
Cost of R.T.*	59,000.00	56,000.00	55,000.00	52,000.00	63,000.00	57,000.00
2007-08	2,55,700.00	1,20,000.00	2,22,500.00	56,500.00	20,000.00	1,54,940.00
2008-09	62,500.00	44,500.00	30,500.00	42,500.00	30,500.00	42,100.00
2009-10	37,500.00	18,500.00	31,000.00	26,500.00	24,000.00	27,500.00
2010-11	61,500.00	52,000.00	55,500.00	55,000.00	51,000.00	55,000.00
2011-12	95,000.00	62,000.00	55,000.00	56,000.00	41,000.00	61,800.00
Average	1,08,440.00	67,300.00	86,100.00	54,600.00	41,400.00	75,568.00

Cost of Rejuvenation Technology

Table 4: Fruit yield obtained in different rejuvenation technology treatments and its categorization under different quality grades year-wise and location-wise

Particulars	Fruit yield (kg/tree)	Categorization of fruit under different quality class			
		Extra Class	Class-I	Class-II	Wastage
Location-I					
Old litchi tree	105.0	16 (15.23%)	32 (30.47%)	42 (40.00%)	13(12.38%)
Rejuvenated trees (3rd Yr)*	57.0	26 (45.61%)	16 (28.07%)	11 (19.29%)	03 (05.26%)
Rejuvenated trees (4th Yr)	89.0	46 (51.68%)	27 (30.33%)	13 (14.61%)	03(03.37%)
Rejuvenated trees (5th Yr)	111.0	56 (50.45%)	30 (27.02%)	18 (16.22%)	07(06.31%)
Location-II					
Old litchi tree	85.0	19 (22.35%)	24 (28.23%)	26 (30.58%)	16 (18.82%)
Rejuvenated trees (3rd Yr)	28.0	12 (42.85%)	10 (35.71%)	04 (14.28%)	02 (07.14%)
Rejuvenated trees (4th Yr)	46.0	21 (45.65%)	14 (30.43%)	07 (15.21%)	04(08.69%)
Rejuvenated trees (5th Yr)	53.0	24 (45.28%)	16 (30.17%)	09 (16.98%)	04(07.57%)
Location-III					
Old litchi tree	55.0	09 (16.36%)	12 (21.18%)	19 (34.54%)	15(27.27%)
Rejuvenated trees (3rd Yr)	49.0	20 (40.81%)	15 (30.61%)	11 (22.44%)	03 (06.12%)
Rejuvenated trees (4th Yr)	77.0	27 (35.06%)	29 (37.66%)	15 (19.48%)	06(07.79%)
Rejuvenated trees (5th Yr)	96.0	41 (42.70%)	31 (32.29%)	17 (17.71%)	07(07.29%)
Location-IV					
Old litchi tree	65.0	17 (26.15%)	21 (32.31%)	16 (24.62%)	11 (16.92%)
Rejuvenated trees(3rd Yr)	74.0	32 (43.24%)	26 (35.14%)	12 (16.21%)	04 (05.41%)
Rejuvenated trees (4th Yr)	98.0	41 (41.84%)	32 (32.65%)	21 (21.42%)	04(04.08%)
Rejuvenated trees (5th Yr)	128.0	47 (36.71%)	40 (31.25%)	33 (25.78%)	08(06.25%)
Location-V					
Old litchi tree	49.0	13 (26.15%)	17 (32.31%)	12 (24.62%)	07 (16.92%)
Rejuvenated trees(3rd Yr)	58.0	24 (41.37%)	20 (34.48%)	08 (13.79%)	02 (03.45%)
Rejuvenated trees (4th Yr)	81.0	33 (40.74%)	25 (30.86%)	19 (23.45%)	04(04.94%)
Rejuvenated trees (5th Yr)	97.0	41 (42.26%)	37 (38.14%)	13 (13.40%)	06(06.19%)

*1st& 2nd year gap period due to non bearing of fruits in rejuvenated trees
**Values in parenthesis represent the corresponding value in percentage

Table 5: Benefit : Cost ratio of rejuvenation technology showing economic feasibility

	Location-I	Location-II	Location-III	Location-IV	Location-V	Average
2007-08	4.81	2.88	3.56	1.95	1.28	2.90
2008-09	2.37	1.98	1.65	1.93	1.65	1.92
2009-10	2.59	1.79	2.32	1.70	2.02	2.08
2010-11	3.67	3.48	3.64	3.62	3.43	3.57
2011-12	6.62	4.64	4.24	4.29	3.41	4.64
Average	4.01	2.95	3.08	2.7	2.36	3.02

management and conservation of old declining, unproductive senile litchi trees in the way to bring back into young productive phase with sustainable production. The operational costs and related activities are not at all putting any financial burden to the growers, rather it proceeds in a profitable way, confirms that the technology is commercially viable and needs convincing extension efforts for boosting adoption level. The government policy support through mission mode (National Horticulture Mission, National Horticulture Board) programmes extending proper training and financial assistance in the form of subsidy will be an added advantage to the farmers/growers in increasing the efficiency and wider adoption of the technology in transforming old senile orchards, improving production and productivity of declined litchi orchards, leading to profitability, prosperity in sustainable manner.

REFERENCES

Bal, J.S. 2006. Fruit Growing : Fruit plant management practices. Kalyani Publishers, pp. 54-66.

Kumar, P. and M.S. Nain. 2012. Technology use pattern and constraint analysis of farmers in Jammu districts of Jammu and Kashmir state of India. *Journal of Community Mobilization and Sustainable Development*, **7**(2): 165-170.

Kumar, R. 2008. Rejuvenation of old senile litchi orchard. Technical Bulletin No. 5, NRC on Litchi publication, pp. 1-12.

Rathore, A.C., H. Lal, N.K. Sharma, Harish Mehta, J. Jayaprakash and O.P. Chaturvedi. 2014. Livelihood security through Litchi (*Litchi chinensis* L.) based agri-horticultural models for resource-poor communities of Indian Sub-Himalya. *Current Science*, **106**(11): 1481-1484.

Received on February, 2014, Revised on July, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 140-144, July-December, 2014

Case Study of Old Age Homes in Delhi: Suggesting Viable Interventions for Future

Mayanka Gupta and Sushma Goel
Department of Resource Management and Design Application, Lady Irwin College, University of Delhi, New Delhi-110001

ABSTRACT

Institutional care for the destitute has always existed in India but, for the elderly especially as an alternative living arrangement is a recent and a viable option. The requirements of institutionalization cannot be denied for those elderly who are neither able to manage their own affairs nor do they have any person to look after them. It also fulfils the affective needs of elderly to live with the same age group. Various stakeholders like NGOs, Welfare Department of the Government; Religious societies play an important role in establishment and effective management of these homes in providing facilities and services to the elderly. Old age homes offer a continuum of lifetime care for elderly with access to various services including food, health and personal asssitance. The paper outlines the case studies of three Old Age Homes in terms of their provision of facilities and services. The paper tries to highlight interventions being organised for the elderly. The findings shows that there exist a vast scope of intervention that can be taken up at these homes for the welfare of the elderly people. The paper suggests a roadmap for future need based interventions and activities that can be taken up for the elderly in these homes.

Keywords: Elderly, Old Age Homes (OAHs), Interventions

INTRODUCTION

The ageing process is a biological reality which has its own dynamics, largely beyond human control. However, it is also subject to the constructions by which each society makes sense of old age. In the developed world, chronological time plays a paramount role. The age of 60 or 65, roughly equivalent to retirement ages in most developed countries is said to be the beginning of old age. In many parts of the developing world, chronological time has little or no importance in the meaning of old age. Other socially constructed meanings of age are more significant such as the roles assigned to older people; in some cases it is the loss of roles accompanying physical decline. Thus, in contrast to the chronological milestones which mark life stages in the developed world, old age in many developing countries is seen to begin at the point when active contribution is no longer possible (Gorman, 2000).

In India, family is idealized as an institution that could take care of the older persons. However, reality tends to vary from this perception; many older persons find living with their adult children to be more difficult than living alone and many do not have a choice and have to live separately from their adult children. In these circumstances old age homes seems to be the choice for the older persons. The question that arises is the attitude of the older persons to these institutionalized settings in the last phase of their life. Do they feel depressed and sad? Do they compromise with the situation or are they happy and free to live life with peer group people? The traditional model of Indian joint family caring for elderly has been breaking down. Living in old age homes is not approved in the Indian culture (Dandekar, 1996). Although institutional care for the destitute has always existed in India but, for the elderly especially as an alternative living arrangement is a recent concept. There are about 12.75 million older persons in India who are without family and they constitute about 30 per cent of the total population of the elderly. The old age homes in India cater to only one per cent of the needy elderly (Ara, 1995).

The projection made by the United Nations (UN) study revealed that by 2050, India will have 324 million elderly, forming over a fifth of the total population, out of which 15% will be over 80 years. Projected increases between 2000 and 2050 in the number of persons aged 60 or older would be 636 million men and 729 million women in the world as a whole (UNO, World population Ageing 1950-2050, 2002).There is dearth of data on the actual numbers of elderly seeking institutional services.

With a broad framework of various areas of need based interventions that could benefit the elderly in future can be taken up in these homes. The capacity building interventions like motivational lectures and informative activities brings positive impact on the group dynamics (Sidhu, 2009). Study results shows continuous home based physiotherapy intervention was effective to improve functional capacity of the elder people living in residential care facilities (Thiyagarajan, 2012). The main aim of these interventions is to take care of the all round needs of elderly i.e. physical, social, leisure, psychological and recreation, etc. The present study was conducted with the major objectives– (1) To understand the functioning of OAHs with regard to service provision. (2) To explore the existing interventions at old age homes. (3) To suggest possible interventions that can be taken up by these homes.

MATERIALS AND METHODS

An explorative approach was applied using a combination of field study and semi-structured interview. Various study trips were carried out in between February and December 2012. Survey of institutional heads of OAHs and elderly residents in the homes was carried out. A total of three OAHs, each one catering to the elderly from different economic background i.e. for LIG, MIG and HIG were selected randomly. Each home manager was subsequently phoned and requisite permission for carrying out the study was taken. On request by the concerned homes, their names have been kept anonymous. In addition to the interviews, data was collected by visual observation of the appearance, design and activities conducted. Semi-structures interviews were designed to capture information regarding various facilities and services being provided and to gain an insight into the gaps that existed and thus subsequently suggesting a roadmap to the interventions needed to improve their living. The three case studies includes interviews with 3 administrative heads and interview with 40 elderly

Case Study 1

Year of Establishment : 1961
Total Number of elderly residents : 110

The Old Age Home is a separate registered society and was established in the year 1961 in 11512 square yards on the Ridge of New Rajinder Nagar. It can house 110 elderly but presently the occupancy is 100. It is well connected to the main road. The home is easily accessible. The home charges one time donation from those elderly who can pay but it offers free services to the elderly who are not in a condition to pay. The OAH caters to elderly from LIG.

Case study 2

Year of Establishment : 1995
Total Capacity : 42

This privately owned home was established in the year 1995 on the main road of Mayur Vihar. It has easy accessibility to markets, parks, banks and other such basic immunities. The home caters to the elderly belonging to MIG. Initially the elderly has to pay a lump sum amount of Rs 8 Lacs that includes 5L of donation and 3L as security. The fees include the charges of accommodation of the elderly till their demise and food charges. The rooms are spacious with attached western toilets. It housed a common kitchen and dining mess where the food served to all residents. The home had the provision for single as well as double bedded rooms thus providing for couple stay. The place is well equipped with lifts to facilitate the residents. The other in-house facilities include a recreation room, Library, big lawns and temple.

Case Study 3

Year of Establishment : 2002
Total Capacity : 61

The homes cater to elderly belonging to HIG offering premier living arrangement. The home offers round the clock common floor attendant, security, maintenance, housekeeping, linen services, wellness, entertainment etc. It offers a gracious, luxurious life within their own secured, beautiful, private apartments.

There is a provision of Single/Double Standard Apartments. Apart from these there is a facility of intercom telephone, T.V with cable connection facility etc. The homes provide meals according to residents' health conditions and Physician's advice.

RESULTS AND DISCUSSION

Admission of elderly: All the three homes catered to only mobile and alert elderly. The homes expressed their intention to take care of the elderly residents within the home until they died, if possible. Interacting with the elderly and discovering their profile, it was found out that, these homes cover a wide range of elderly, from 60 years up to more than 90 years. Elderly coming to these homes come from different social background, ethnic groups, held different opinions.

Facilities and services

Infrastructure: The homes are situated in community with easy accessibility. The homes had provision for single and double occupancy. The buildings were equipped with necessary facilities but were not disabled friendly. Ramps were only provided in the home catering to HIG group elderly. Elderly were given an option to choose according to their paying capacity as shared rooms were cheaper in comparison to single rooms. The sizes of the room vary in the complex. The rooms in the HIG OAH were more spacious and better ventilated than the rest especially the LIG home where the rooms were gloomy and cramped. Residents are required to bring their own furniture. The staff comprises of a Manager, guard, cleaners and medical staff including doctor and nurse. Al the homes provide a big lawn wherein concrete benches are provided for seating. All the OAHs provided food and dining facility to the elderly residents, Home has a common kitchen which offers meals at subsidized rate in LIG home whereas in rest one had to pay good amount for availing the service. Paid service of laundry can be availed.

Safety: The homesare some what designed keeping the safety considerations in mind. Adequate lighting during night time, guard, non-slippery floor, wide passages for free movement, furniture with no sharp ends, and availability of fire extinguisher are some of safety measures taken into consideration. However grab bars in toilets and emergency alarm buttons like call buttons in bathrooms and rooms were not provided.

Health: The LIG OAH was equipped with medical facilities. The home has four separate medical care units namely -Homeopathy, naturopathy, Physiotherapy and Dental Clinic. These medical facilities are availed by the resident elderly at a very nominal change. Home also has an ambulance donated by rotary club to meet the emergencies. At the MIG and HIG Home a visiting doctor coming twice a week is provided for the residents. Health camps are organized for the residents by the concerned NGOs at their own will. Facility of ambulance was only provided in 2 homes. Unique feature of the HIG home was the provision of gym with various equipments. However, the elderly can only avail the facility under the instructor with the permission of the doctor. No effort was made at these homes to organise regular medical camps and distribution of free medicines.

Leisure & Recreation: The various facilities includes at homes included Library & Reading Room, indoor games like chess, carrom. All the home catered to the religious needs of the elderly. They organized various religious programs like *havans, kirtans*. Outreach activities like interaction with children from various schools, medical camps organized by private agencies like rotary, lions club is organized during the year.Other facilities includes the celebration of birthdays, musical evenings only at HIG home.

Perception of elderly regarding the living at OAHs: The most important aspect of change needed as desired by elderly (52%) is inclusion of optioning at meal time. Apart from the home catering to HIG group, rest two homes did not cater to the choice of meal in accordance to the health of elderly. The reasons cited by the homes were the lack of staff, and cost. Most of the residents (64%) complained of falling and lack of absence of emergency alert like call buttons in bathroom to call for help in time of need. The resident complained of lack of physical exercise and health interventions. Other problems reported by the residents in these homes were long queues in the LIG home as they had to use the common toilet. As it is well known that after a certain age, elderly have difficulty in controlling/holding urine (especially during night time) till they reached the toilet. This gets further compounded with mobility problems as most elderly suffer from arthritis which restricts their movement. Due to these concerns, all the elderly urged that if they were provided with toilets attached to their rooms so that there was no time spent to walk upto

the toilet or wait for their turn to use the facility. The elderly from the MIG and HIG complained of high electricity bills and water bills and thus demanded a viable option to reduce the soaring cost. Only 42 % percent elderly participated in different activities at the home. Thirty percent elderly felt that the home fulfils the role of a service provider Fifty five per cent elderly were of the opinion that there was a need to upgrade the programmes in the areas focusing on health and wellness, opportunities for volunteer work for the betterment of society. Seventy percent elderly felt the need for some more activities for their capacity building like learning to operate mobiles, cooking, making hand crafted goods etc. An urgent need to provide facilities such as group programs, celebrations, and outdoor visit was felt by most elderly.

Areas for intervention	Interventions
Physical	
Diet & nutrition	• Awareness sessions on nutritious diet, low cost meals, therapeutic diet • Traditional innovations in cooking (elderly volunteering for cooking at the mess) • Including choice of the elderly in the menu planning and also catering to health requirements of elderly
Health	• Regular health check up and monitoring • Regular lectures on diseases and their management • In-house yoga and meditation trainers
Other facilities	• Availing services of Mobile Medicare Unit (MMU) • Ready ambulance service to tackle emergencies • Availability of 24/7 nurse • In-house availability of physiotherapist, acupressure and massage services
Liaison	• Liaison with nearby hospitals for check up of elderly at subsidized rates • With various welfare agencies like Rotary, Lion's club, NGOs for free distribution of medicines especially for economically weaker sections
Design of OAHs	
Safety	• Provision of grab bars in rooms and toilets • Provision of emergency alarm devices like call buttons in all rooms and toilets • Non-slippery floors, contrast of wall and floor color
Elderly Friendly structures	• Designing disabled friendly homes, provision of ramps, adequate lighting, wide passages • Provision of lifts • Attached toilets-western and Indian • Barrier free design of rooms, bathrooms and kitchen • Facility for solar based lighting, heating and cooling system
Recreation & Leisure	
Religious	• Organizing religious/spiritual activities weekly
Games	• Organizing various games by the trainer/volunteer • Group activities like dancing, sing-s longs • Brain age games
Outdoor trips	• Organizing outdoor trips for picnics, travel destination
Knowledge based programmes	• Awareness sessions on their rights & privileges, latest technology care, assistive devices
Capacity building of elderly	
Technology intervention	• Technology interventions like training sessions for computer learning, operating mobiles
Income generating programmes	• Like toy making, cards, candle making, weaving, etc
Leadership	• Forming their association within the old age home and thus taking up various activities for managing and organ sing activities at home
Others	• Engagement with schools for *dadi and nani ki kahaniyan* program. Thus utilizing the vast experience of elderly
Psychological	
Counseling	• In –house counselor
Stress management	• Programmes like time –slips, life –review by specialized trainers to reduce stress
Networking	• Creating common portal of various old age homes and connecting them to each other so that elderly can share various concerns

Roadmap for Interventions: The survey of the homes and problems encountered by elderly has enabled us to identify various interventions needed. Thus a flexible approach of intervention catering to their needs is most required. In order to tackle the issue of elderly care in OAHs in a holistic manner, interventions are categorized under physical design, recreation and leisure and psychological interventions.

CONCLUSION

Though these old age homes are in nascent stage but in future they will responsible for the well –being of thousands of elderly. The mission of these homes should be to provide quality services that delight the elderly and is a key to the sustainability of the organization. Thus these homes act as focal points where services of counseling, employment, educational programs, capacity building can be taken at large. The range of activities should meet the needs of all residents, from the disoriented to the wheelchair bound to the ambulatory. However the structure and delivery of programs can vary from home to home.

REFERENCES

Ara Shabeen. 1995. Old Age Homes-The Last Resort. *Research and Development Journal*, **2**(1): 3-10.

Dandekar, K. 1996. The elderly in India, Sage Publications, New Delhi.

Gorman M. 1999. Development and the rights of older people. *In*: Randel, J., *et al.*, eds. The ageing and development report: poverty, independence and the world's older people. London, Earthscan Publications Ltd., pp. 3-21.

Sidhu, K. 2009. Capacity building for efficiency enhancement of self help crops. *Journal of Mobilization and Sustainable Development,* 4(1): 80-83.

United Nations. 2002. *World Population Ageing*, 1950-2050. New York.

Thiyagarajan, S. 2012. Targeted Multiple Physical therapy Interventions to Improve Functional Capacity for Elderly Residing at Old Age Home. *J. Yoga Phys Ther.,* **2**: 126. (Accessed on 25.12.14).

Received on February, 2014, Revised on July, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 145-148, July-December, 2014

Problems and Prospects of Women Entrepreneurship in Kerala

V. Sreeram
National Dairy Research Institute, Karnal, Haryana

ABSTRACT

Study was conducted in Palakkad district of Kerala with the objective of identifying the problems and prospects of rural women entrepreneurship of the Kudumbashree Neighbourhood Groups (NHGs). A sample of 120 respondents was selected. The Garrett's Ranking principle was applied to rank the factor which had more influence and bearing on the enterprise. With the Garret mean score of 63.3 and 60.25, respectively problems related to marketing of the produce and problems related to enterprise respectively were ranked as the main constraints. Suggestions of the women entrepreneurs were also drawn on how to overcome the problems faced by them. It revealed that majority of them were concerned about marketing of their produce and functioning of the enterprise and had given suggestions on these aspects.

Keywords: Neighbourhood Group (NHG), Women entrepreneur

INTRODUCTION

Rural women's entrepreneurship can contribute to economic growth in developing countries and clearly represents an untapped potential. Kudumbasree, the poverty eradication mission of the State of Kerala is a community based self-help initiative involving poor women. It has been envisaged as an approach to poverty alleviation focusing primarily on micro finance and micro-enterprise development, and integrally linked to local self-government institutions. Inspired by the idea of group mobilization and consequent collective action as an important strategy to overcomethe various constraints (Sajesh *et al.*, 2013), the programme accomplishes its mission to economically strengthen poor women through the system of collective thrift accounts in the Neighbourhood Groups. Another side of economic empowerment is the setting up of micro enterprises with which the women can carry out various activities. Under the Kudumbashree programme, micro enterprise development will start with low capital, low risk and low profit at the initial stage. In an advanced stage, some of these enterprises reach medium capital and medium profit with appropriate technology and market. Social networking among the women is an added advantage, which will help to develop self-confidence, awareness and ability to marshal economic support (Sharma *et al.,* 2008). While women entrepreneurs have demonstrated their potential, the fact remains that they are capable of contributing much more than what they already are (Sathiabama, 2010). There are certain problems and challenges that they face in running their enterprise which act as the stumbling blocks, hindering their progress. Unless and until these issues are addressed the progress and sustainability of the enterprises will not become a reality.

MATERIALS AND METHODS

Palakkad district of Kerala was purposively selected as the largest numbers of NHGs are reported from the district, according to Palakkad Kudumbashree District Mission. A total of six villages were selected from three Talukas viz. Alathur, Ottappalam and Palakkad following the random sampling. The study was based on workplace survey of randomly selected Neighbourhood Group members comprising 120 respondents following the *ex-post facto* research design. Primary data was collected with the help of a pre-tested structured schedule by conducting personal interview of the respondents. Garret ranking technique was followed to find out the most important problem faced by the entrepreneurs six (6) factors were identified and as listed in the Table 1 were used for detailed discussion so as to identity which factor had more influence on respondent's enterprise. A detailed

discussion on these 6 specific problems was analyzed with the help of Garrett's Ranking Technique. The order of merit thus given by the respondent for the 6 specific problems was converted into ranks by using the formula.

$$\text{Percent position} = \frac{100\ (R - 0.50)}{N}$$

Where, R = Rank given by the factor by respondents
N = Number of factors ranked by the respondents

The ranks thus obtained were converted into scores by referring to the table given by Garrett. Then for each problem, the scores of individual respondents were added and divided by the total number of respondents whose scores were added. The mean scores for all the problems were arranged in the ascending order and ranks were shown in the order of importance in Table 1.

RESULTS AND DISCUSSION

The problems and constraints of women entrepreneurs of Kudumbashree were classified into six factors based on the review of literature and pretesting was conducted before the sample survey. They were a. Problems related to marketing of the produce b. Problems related to functioning of the enterprise c. Problems related to input availability d. Problems related to management of the enterprise e. Problems related to credit e. Problems related to labour. The problems and challenges were ranked according to their perceived importance by the respondents.

Problems related to marketing of the product includes delayed payment for the products purchased, less demand for the products, prejudices among the consumers about quality of the product, and lack of proper marketing place. With a Garret mean score of 63.33 marketing problems was identified as the main factor which is evident from the Table 1. It is followed by problems related to functioning of the enterprise, with a Garret mean score of 60.25 under which competition from other micro enterprises, less remunerative work and lack of fair price for their products were reported. Problems related to input availability ranked third with a Garret mean score of 53.77. The main problems related to input availability were non availability of inputs in the nearby markets for its wholesale purchase, high cost of inputs, unavailability at the right time and inferior quality of inputs. The problem which ranked fourth was related to management of the enterprise with a Garret mean score 47.37 and it took into account, non cooperation among the NHG members and irregular meetings. The next major problem identified was problems related to credit under which non availability of credit at a lower interest rates and difficulty in getting loans from the formal sources were reported. It was having a Garret mean score of 42.32. Finally the least perceived problem identified was related to labour with a mean score of 34.93. Problems like unsatisfactory working conditions were identified.

In the study it is found that the Kudumbashree Neighbourhood Groups are confronting with a myriad of problems. However a number of suggestions were put forward by them to effectively tackle these problems and thereby leading to better entrepreneurship. A list of suggestions given by the Neighbourhood Groups is presented in the Table 3.

Mainly suggestions were given for overcoming the problems related to marketing of the product (41.66%) reiterating the findings of Yadav (2008), in which include regular payment of the money for the products purchased will make running of the enterprise more efficient. It focuses to the major problem of delayed payment as in the case of Nutrimix product where the ICDS department has to pay for the supply of product which was made to Anganwadis. It was followed by

Table 1: Problems and constraints of Kudumbashree microenterprises-different factors

S.No.	Factors	Garret mean scores	Rank
1.	Problems related to marketing of the product	63.33	1
2.	Problems related to management of the enterprise	60.25	2
3.	Problems related to input	53.77	3
4.	Problems related to management of the enterprise	47.37	4
5.	Problems related to credit	42.32	5
6.	Problems related to labour	34.93	6

Table 2: Different micro enterprises reported from the sampled area

S.No.	Kudumbashree microenterprises	Number of respondents	Percentage of respondents
1.	Amrutham Nutrimix unit	30	25.00
2.	Textile bag making unit	19	15.83
3.	Coconut oil and other products (Soap, bathroom lotion etc.)	16	13.33
4.	Samagra Kondattam (Dried vegetables)	13	10.00
5.	Kudumbashree Canteen	10	8.33
6.	Bamboo Handicrafts Unit	8	6.67
7.	Cotton spinning unit	8	6.67
8.	Tailoring Unit	7	5.84
9.	Footwear making Unit	4	3.33
10.	Milk products Unit	3	2.50
11.	Ornament making unit	3	2.50
	Total	**120**	**100.00**

Table 3: Suggestions given by the respondents to overcome the problems faced

S.No.	Suggestions	Respondents		Rank
		Frequency	Percentage	
1.	**Suggestions related to marketing of the produce**			
a.	The payment of money for the products purchased should be made regular and punctual.(e.g. ICDS payment for Nutrimix)			
b.	Prejudices among the consumers about quality of the produce should be removed through better advertisements	50	41.66	**I**
c.	Proper marketing place should be arranged especially for attending the Melas, Exhibitions etc.			
2.	**Suggestions related to enterprise**			
a.	The competition among the units should be made fair by fixing the price for a product by KudumbashreeZilla Mission			
b.	To meet the customer demands, more improved machineries are needed which should be provided.(e.g.: photo printing machine)	47	39.16	**II**
c.	Kudumbashree should give more skill oriented trainings or impart improved techniques to do the works more efficiently.			
3.	**Suggestions related to credit**			
a.	Timely supply of credit should be ensured.			
b.	NHG-bank linkage should be ensured for all approved projects.	45	37.49	**III**
c.	More credit facilities with lower interest rates through cooperative societies.			
d.	Creation of a bank exclusively for Kudumbashree Neighbourhood Groups			
4.	**Suggestions related to input supply**			
a.	District mission should purchase the inputs for whole sale and supply to those enterprises which are producing similar products.	44	35.82	**IV**
b.	Inputs should be given at subsidized rates for the micro enterprises by the Govt.			
5.	**Suggestions related to management of enterprise**			
a.	The Group leader of NHG should be actively involved in the dispute settlements	22	18.33	**V**
b.	Attendance in the meetings and thrift collection should be made compulsory.			

removing the prejudices among the consumers about the quality of their products through better advertisements and arranging proper marketing place for sale in their respective villages and especially for participating in Melas and Exhibitions as evident from Table 3. At next suggestions were given for better functioning of the enterprise (39.16%) under which most of the respondents demanded the active role of Kudumbashree Zilla Mission in making the market competition fair among the various units as well as from other micro enterprises. It is followed by need for improved machineries to meet the increasing demand for the products and demand for more skill oriented training programmes which was evident from Table 3. Suggestions related to related to the credit (37.49%) ranked next in which, timely supply of the credit, Neighbourhood Group Bank Linkage for all approved micro enterprises, credit through cooperative societies at lower interest rates and creation of a bank exclusively for Kudumbashree entrepreneurs were the prominent ones. Fourth ranked was suggestions related to input supply with 35.82 per cent of the respondents under which suggestions given include, sourcing of inputs in wholesale by the district mission and its distribution to enterprises and provision of inputs at subsidized rates for Kudumbashree microenterprise. Finally suggestions were given for proper management of the enterprise (18.33%) which comprised, active role to be played by the Group leader in managing the group conflicts and compulsory attendance in group meetings and thrift collection were put forward.

CONCLUSION

Efforts being taken at different levels brought promise of equality of opportunity in all spheres of life to the Indian women. But unfortunately, the government sponsored development activities have benefited only a small section of women i.e. the urban middle class women. At this juncture, effective steps are needed to provide entrepreneurial awareness, orientation and skill development programs to women as well as conducting behavioural training programmes focusing on the entrepreneurial traits aimed at the marginalized lower class to make it more inclusive. From the present study, it can be concluded that even though the Kudumbashree Neighbourhood groups are facing a myriad of constraints, the members are aware about them and they are having their own suggestions to solve the problems for a better entrepreneurship. But it needs support from the concerned authority right from the grass root level, the group leader of NHG to the top Kudumbashree Zilla Mission. The problems like delayed payment for the products purchased and competition among similar enterprises needs urgent attention and action. The sustainability of the enterprises can be ensured by addressing the constraints at different levels.

REFERENCES

Goyal, M. and J. Prakash. 2011. Women entrepreneurs in India-Problems and prospects, *International Journal of Multidisciplinary Research*, **1**(5): ISSN 2231 5780.

Sajesh, V.K. and P. Ramasundaram. 2013. Effectiveness of Collective Farming under Kudumbasree programme of Kerala. *Journal of Community Mobilization and Sustainable Development*, **8**(2): 276-281.

Sathiabama, K. 2010. Rural women empowerment and entrepreneurship development. Gandhi gram Rural Institute, Gandhi gram, Dindigal, Tamilnadu.

Sharma, A. and K. Vandana. 2008. Assessment of Entrepreneurial Profile of Rural Women. *Journal of Community Mobilization and Sustainable Development*, **3**: 1-8.

Singh, R. 2008. Managerial competencies of women business owners. *Journal of Community Mobilization and Sustainable Development*, **3**: 21-32.

Yadav, G.P., J.P. Sharma and J.D. Tripathi. 2008. Techno-Economic and infrastructural constraints faced by women entrepreneurs of Bikapur block of Faizabad district. *Journal of Community Mobilization and Sustainable Development*, **3**: 9-14.

Received on December, 2013, Revised on June, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 149-154, July-December, 2014

Training Needs for Livelihood Diversification of the Farmers of West Bengal

Biswarup Saha and Ram Bahal
Department of Fisheries Extension, College of Fisheries, Central Agricultural University, Lembucherra, West Tripura, Tripura-799210, West Bengal

ABSTRACT

Livelihood diversification is a sound alternative for higher economic growth and its success or failure is conditioned by interplay of multitude of factors. Based on research from Darjeeling and Uttar Dinajpur districts of West Bengal this paper presents evidence that out of the total 160 sample about 115 respondents diversified their livelihood. Further, around 53 per cent of the diversifiers were successful were sufficiently confident of its business potential to invest further in either expansion or improvement subsequent to its establishment. Majority of the diversifiers (62.50%) under the high success category adopted non-farming nature of diversification along with farm diversification. On the other hand, under the low success category, majority of the respondents (45.46%) depended on farm diversification only for their sole livelihood activity. The successful diversifiers had three most important training needs and the unsuccessful diversifiers perceived that they need awareness about diversification, development of entrepreneurial capabilities and optimum use of resources. The most relevant training needs of non-diversifier farmers were profitable levels of diversification in crop farming, overcoming the fear of change in their traditional farming systems and vulnerability management strategy.

Keywords: Training need, Livelihood diversification, Farmers

INTRODUCTION

Decreasing land man ratio, poor socio economic condition of the farmers, vagaries nature of agriculture, new risks from environmental deterioration, population pressure and rapidly changing agricultural input and output markets through globalization, high degree of vulnerability proved to be not sustained farmer's livelihood mainly when they are solely depended on traditional agriculture on their small piece of lands. Therefore, livelihood diversification is utmost important for improving their livelihood and reducing vulnerability. Diversification is the single most important source of poverty reduction for small farmers in South and South East Asia (FAO and World Bank, 2001). In the light of the reiterated environmental, economic and political shocks affecting rural areas of developing countries, diversification has become increasingly attractive for many rural households during the last 30 years. Rural livelihood diversification is defined as the process by which rural households construct an increasingly diverse portfolio of activities and assets in order to survive and to improve their standard of living (Ellis, 2000).

People diversify by adopting a range of activities. Thus, income sources may include 'farm income', 'non-farm income' (non-agricultural income sources, such as non-farm wages and business income), and 'off-farm income' (wages of exchange labour on other farms – i.e. within agriculture, including payment in kind). Livelihood diversification has generally occurred as a result of an increased importance of off-farm earning in household livelihood portfolio or through the development of new forms of on-farm/on-site production of non-conventional marketable commodities. In both cases, diversification ranges from a temporary change of household livelihood portfolio to a deliberate attempt to optimize household capacity to take advantage of ever-changing opportunities and cope with unexpected constraints.

Extension training is one of the central concerns of agricultural extension (Choudhary *et al*., 2013). It is essential to induce motivation, create confidence and inculcate efficiency in an individual. In order to make any training meaningful and effective, it is imperative on the part of the training organizers to identify the training needs of the farmers based on which a suitable training module can be developed so that the appropriate training is given to the right people, in the right form, at the right time so that higher degree of productivity and profitability can be achieved. Therefore, it was considered worthwhile to study the potentiality to realize opportunity of the farmers and their social situations with a view to bringing out some significant factors having a bearing on success of the diversified livelihood. Looking to these facts, the present study was carried out to identify training needs of the non-diversifiers, successful diversifiers and non-diversifiers farmers in livelihood diversification.

MATERIAL AND METHODS

The present study has been conducted on West Bengal since economy of this state is diversifying at a faster rate than at all-India level (Singh *et al.*, 2006). Despite dominance of crop agriculture in West Bengal, it is striking that only 41 per cent of the workforce now depends on agriculture for livelihood (WBHDR, 2004). Widespread and increasing reliance on non-farm activities is an emerging feature in West Bengal, but statistics also point to the fact that at the aggregate level, the job creation has shifted to more of casual and marginal works (WBHDR, 2004). The two districts namely Uttar Dinajpur and Darjeeling were selected as they represent different type of agro-climatic and socio-economic conditions of the state. Besides, two blocks from each district and two villages from each block were also selected randomly. Twenty households in each village were randomly selected to constitute a total sample size of 160. Both secondary and primary data were used for the study. A semi-structured interview schedule was developed based upon the information acquired during the explorative research phase, and pre-tested and adapted prior to the survey. Data were analysed with the suitable statistical tools. To measure the success of diversified occupation of farmers in the study area a success – failure scale was developed following the steps used by Singh *et al.* (1970). A semi-structured questionnaire was developed based upon the information acquired during the explorative research phase, and pre-tested prior to the survey. The respondents were asked to pinpoint the training need area applicable to them. The response to each item was obtained on a 3-point continuum: "most needed", "needed" and "not needed" with weights assigned 2, 1 and 0 respectively as per judges opinion. Relevancy coefficients were obtained for each item by dividing the actual score obtained with the maximum possible score and based on these values, the needs were ranked.

RESULTS AND DISCUSSION

Out of 160 respondents in the study area 115 respondents were diversified their livelihood. The responses collected from 115 diversifiers on the success-failure scale developed were analyzed to classify the respondents into two groups –successful and unsuccessful. The total score of a respondent was obtained by summing up his score on six critical indicators out of a total of ten indicators in the scale. In this way out of 115 farmers who were diversified their livelihood, 61 were found in successful group and the rest 54 in unsuccessful group. Therefore it may be concluded that in the study area, 53 per cent of the diversifiers were successful and 47 per cent unsuccessful in their diversified activities. This analysis is taken further by classifying the successful group according to the degree of success. For this, the scores obtained by the successful respondents on all the ten items of the success-failure scale were added and each group was classified into four classes as per score range assigned to each class. The data pertaining to classification of successful diversifiers as per their degree of success have been reported in Table 1. A glance of the table reveals that majority of the successful diversifiers i.e. 40.98 per cent were under moderately high success category.

Table 1: Distribution of respondents according to the degree of success

Level of success	Score range	Frequency	Percentage
Low Success	Up to 110	11	18.03
Moderately low success	111-125	17	27.87
Moderately high success	126-140	25	40.98
High success	Above 140	8	13.12
Total		**61**	**100**

Degree of success and nature of diversification: Diversification forms prevalent in rural areas could be farm, non-farm, migration and combination of these. The diversification within the farm sector takes place through crop diversification i.e.; either shifting to high value traditional crop, cash crop, enterprise crop or scaling up the agri-allied activity such as holding up livestock, sericulture, bee-keeping etc. In the non-farm route, the rural producer is involved in wide variety of activities, ranging from tiny and cottage level manufacturing, through processing to trade and services. The rate of success is not uniform in all types of diversification as some activities or strategies of diversification have better chances of success. Keeping this generalization in view, an analysis was made to see the rate of success in different activities of varying nature. Different diversification activities were further divided into broad category of diversification. Success rate of respondents within the broad category of diversification were worked out. The data in this regard are reported in Table 2.

A glance at the data reveals that majority of the diversifiers (62.50%) under the high success category adopted non-farming nature of diversification along with farm diversification. On the other hand, under the low success category, majority of the respondents (45.46%) were depended on farm diversification only for their sole livelihood activity. It can be safely concluded from the Table 2 that the success rate was higher in the combination of farm as well as non-farm category of diversification. This combination is complementary in nature. Farmers used the surplus generated through non-farm activity in purchasing of input for cultivation. Farming alone in the study area is very risky. Crop yields are subjects to the uncertainties of rainfall and input supply. Farming incomes are subjects to the uncertainties of both yields and prices. Berstein *et al.* (1992) and Berry (1989) found the similar findings. In this context, Haggblade *et al.* (1989) have suggested that certain policy interventions are necessary to allow positive farm and non- farm growth linkage.

Training needs perceived by non-diversifiers: The training needs of farmers and his family to diversify their livelihood fruitfully so as to achieve livelihood out comes were explored in the study, the training needs were identified among non-diversifiers, successful diversifier's and unsuccessful diversifiers. The results of which are discussed below. A cursory glance of the data in the Table 3 revealed that the most relevant training needs of non-diversifier farmers were profitable levels of diversification in crop farming, overcoming the fear of change in their traditional farming systems and vulnerability management strategy. The poor and illiterate farmers generally had grown traditional food crops in their piece of lands from generation to generation. They were mostly laggards and don't have the ability to diversify beyond their familiarity. They did not introduce the important cash crops in the large scale because of lack of awareness about other crops profitability and due to fear of changes. The fear also hinders them to diversify into other profitable income sources. Therefore, overcoming the fear to change their traditional farming system is an utmost important training need for non-diversifiers farmers. Vulnerability management strategy also very important training needs as perceived by the non-diversifier farmers. In vulnerability management the farmers were interested to make an expertise as well as awareness of different types of *ex ante* coping mechanism to prepare themselves before the shock happens.

Training needs perceived by un-successful diversifiers: A perusal of the Table 4 reveals that the three most important training needs for unsuccessful

Table 2: Distribution of successful diversifiers by degree of success and nature of diversification

Broad category of diversification	Degree of success in diversified activities				Total
	Low success (Up to 110)	Moderately low success (111-125)	Moderately high success (126-140)	High success (140 & above)	
Farming alone	5(45.46)	6(35.29)	6(24.00)	1(12.50)	18
Farming + Non farming	2(18.18)	5(29.41)	18(72.00)	5(62.50)	30
Farming + Migration	2(18.18)	4(23.52)	1(4.00)	0(0)	7
Farming + Non farming + Migration	2(18.18)	2(11.78)	0(0)	2(25.00)	6
Total	**11(100)**	**17(100)**	**25(100)**	**8(100)**	**61**

Table 3: Training needs in livelihood diversification for non-diversifiers (n = 45)

S.No.	Areas of diversification	Mean score	Rank
1.	Profitable levels of diversification in crop farming	2.70	I
2.	Overcoming the fear of change in their traditional farming system	2.62	II
3.	Vulnerability management strategy	2.48	III
4.	Awareness about diversification	2.42	IV
5.	Developing entrepreneurial capabilities	2.38	V
6.	Optimum use of resources	2.30	VI
7.	Identification of opportunities for fulltime employment	2.26	VII
8.	Required skill for particular activity	2.22	VIII
9.	Input distribution	2.10	IX
10.	Activity mix strategy	2.04	X
11.	Self-help group formation	1.98	XI
12.	Rural based women entrepreneurship	1.82	XII
13.	Time management and planning the operation	1.78	XIII
14.	Mobilizing savings and assets formation	1.65	XIV
15.	Criteria for product	1.52	XV
16.	Value addition	1.51	XVI
17.	Post harvest technology	1.40	XVII
18.	Analysis future growth	1.28	XVIII
19.	Cash flow technique	1.18	XIX
20.	Output marketing analysis	1.12	XX

diversifiers were awareness about diversification, development of entrepreneurial capabilities and optimum use of resources.

Entrepreneurial capabilities such as risk taking abilities, high degree of motivation etc., which perceived by them were utmost important to successful in developing any small scale enterprise specifically and livelihood diversification in general. Awareness about diversification such as different profitable options for diversification from which rural household will choose and gain expertise was very important. The most cost-effective opportunity to ensure maintenance of its livelihood was very important sides of training need. Optimum use of existing resources to improve their livelihood was also an important training need. According to the unsuccessful group the poor vision and ability to utilize the existing resources made them inefficient and economically weak. In this connection the farming system research will be very effective in their local condition. Vulnerability management strategy was also very important training needs as perceived by the unsuccessful diversifier farmers. Required skill for particular diversified activity which would be suitable and economically viable for them was also perceived by the unsuccessful diversifiers as one of the important training needs.

Training needs perceived by successful diversifiers: The most successful diversifiers perceived following growth related training needs for future improvement in their existing activities and also to diversifying into other suitable activities. A simple glance on the Table-5 revealed that the three most important training needs perceived by successful diversifiers were activity mix strategy, optimum use of resources and self-help group formation. Activity mix strategy within their enterprises or somewhat out side and related with their existing activities is the most important training need perceived by majority of the successful diversifiers. This is the utmost important training need to achieve futures growth in their existing activities and generating higher income with a view to further diversification. Optimum use of resources were also much needed. Successful diversifiers felt that there was still a wide gap between existing total resource they had and their optimum utilization for their betterment. Some successful farmers attributed that they couldn't utilize the resources fully because of lack of managerial abilities, lack of family labour and shortage of financial assets. The successful diversifiers were somewhat aware of the benefit of self help group. They were very much interested to form such of the group in their locality. Therefore, training on self-help group formation was also needed by them.

Table 4: Training needs in livelihood diversification for un- successful diversifiers (n=54)

S.No.	Areas of diversification	Mean score	Rank
1.	Awareness about diversification	2.77	I
2.	Developing entrepreneurial capabilities	2.74	II
3.	Optimum use of resources	2.68	III
4.	Vulnerability management strategy	2.55	IV
5.	Required skill for particular activity	2.51	V
6.	Identification of opportunities for fulltime employment	2.40	VI
7.	Rural based women entrepreneurship	2.36	VII
8.	Profitable levels of diversification of crop farming	2.29	VIII
9.	Overcoming the fear of change in their traditional farming system	2.16	IX
10.	Value addition	1.98	X
11.	Activity mix strategy	1.88	XI
12.	Mobilizing savings and assets formation	1.72	XII
13.	Self-help group formation	1.66	XIII
14.	Post harvest technology	1.42	XIV
15.	Time management and planning the operation	1.36	XV
16.	Input distribution	1.33	XVI
17.	Output marketing analysis	1.21	XVII
18.	Cash flow technique	1.20	XVIII
19.	Analysis future growth	1.18	XIX
20.	Criteria for product	1.05	XIX

Table 5: Training needs in livelihood diversification for successful diversifiers (n=61)

S.No.	Areas of diversification	Mean score	Rank
1.	Activity mix strategy	2.80	I
2.	Optimum use of resources	2.69	II
3.	Self-help group formation	2.65	III
4.	Analysis future growth	2.60	IV
5.	Required skill for particular activity	2.49	V
6.	Criteria for product	2.43	VI
7.	Value addition	2.28	VII
8.	Profitable levels of diversification of crop farming	2.23	VIII
9.	Developing entrepreneurial capabilities	2.16	IX
10.	Awareness about diversification	2.02	X
11.	Time management and planning the operation	1.95	XI
12.	Rural based women entrepreneurship	1.73	XII
13.	Output marketing analysis	1.62	XIII
14.	Mobilizing savings and assets formation	1.49	XIV
15.	Identification of opportunities for fulltime employment	1.47	XV
16.	Post harvest technology	1.23	XVI
17.	Vulnerability management strategy	1.18	XVII
18.	Overcoming the fear of change in their traditional farming system	1.12	XVIII
19.	Cash flow technique	1.08	XIX
20.	Input distribution	1.07	XX

Individual and household identity and vision of the future might also shape diversification decisions. For instance, new non-farm activities can be preferred to traditional wage labor as livelihood diversification strategies, because they are perceived more consistent with maintaining a rural life style. Required skill for particular activity was also one of the important training needs as perceived by successful diversifiers. In this connection. Similar results were reported by Nain and Chandel (2010) in identification of training need in J&K state and reported that 72.5 percent of the respondent preferred 25 per cent, theory and 75 per cent of practical,as being adults and experienced farmers, with practical part they may found more meaningful.

CONCLUSION

One of the broad conclusions from this study is that on about 53 per cent of the diversifiers were successful. Successful diversifiers felt that the obstacles in the path of livelihood diversification were not substantive enough to hinder them from taking the efforts. However, a good percentage of farmers did not overcome the barriers. Therefore, the extension agents, mass media and facilitative strategy must be geared up and continue their efforts. Economics security, proper market facility needs to be increased by making provisions for assured supply of inputs and the proper delivery of the outputs, so that more and more farmers can be roped in for diversified activities to secure their livelihood. Economic motivation and risk orientation are to be kept in view while planning for the diversification besides the other physical resources. The positive link between farm and non-farm income implies that increasing agricultural output and raising agricultural productivity cannot be done in isolation. Comple-mentary policies and programmes must be developed to strengthen the link between farm and non-farm activities.

REFERENCES

Bernstein, H., B. Crow and H. Johnson. 1992. Rural Livelihoods: Crises and Response Oxford: Oxford University Press and The Open University.

Berry, S. 1989. Coping with Confusion: African Farmers' Responses to Economic Instability in the 1970s and 1980s, Boston: African Studies Centre, Boston University.

Choudhary, L.R., N.K. Sharma, K.L. Dangi and P.S. Chauhan. 2013. Study on Training Needs of Agricultural Supervisors in Jaipur District of Rajasthan. *Journal of Community Mobilization and Sustainable Development*, **8**(2): 270-275.

Ellis, F. 2000. Rural Livelihoods and Diversity in Developing Countries. Oxford: Oxford University Press.

FAO and World Bank. 2001. Farming Systems and Poverty-Improving Farmers livelihoods in a changing World, Rome and Washington D.C.

Haggblade, S., P. Hazell and J. Brown. 1989. Farm-Non-farm linkages in rural sub-Saharan Africa. *World Development,* **17**(8): 1173-1201.

Nain, M.S. and S.S. Chandel. 2010. Determinants of Farmers' Training Needs in Agri-horti Farming System: A Study of J&K State. *Journal of Community Mobilization and Sustainable Development*, **5**(2): 23-27.

Singh, K.N., S.N., Singh, K. Pal and J. Sigh. 1970. A Scale for Measurement of Agricultural Progressiveness of a Village. In: Singh, K.N. *et al.* (Eds.) Measurement in Extension Research: Instruments Developed at IARI (1963-1972), Division of Agricultural Extension, IARI, New Delhi.

Singh, N.P., R. Kumar and R.P. Singh. 2006. Diversification of Indian agriculture: Composition, determinants and trade implications. *Agricultural Economics Research Review,* **19**: 23-36.

WBHDR. 2004. West Bengal Human Development Report, Development and Planning Department, Government of West Bengal, Kolkata.

Received on October, 2013, Revised on June, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 155-158, July-December, 2014

Impact of on Plastic Mulching Technology on Production Economics of Off-Season Vegetables in Uttarakhand Hills

V.P. Singh[1], Lalit Bhatt[1] and Netrapal Malik[2]
[1]G.B. Pant University of Agriculture and Technology, Pantnagar-263145, Uttarakhand
[2]Krishi Vigyan Kendra (CSA University of Agriculture and Technology, Kanpur), C.D.F. Complex, Chherat, Aligarh-202122, U.P.

ABSTRACT

The climatic conditions of Uttarakhand hills offer bright potential for off-season vegetables cultivation under different altitudic zones i.e. summer and rainy season. However, various biotic and abiotic factors are the major hurdle in achieving the desired yield potential. Use of mulches in vegetable production offers a cheap and practical solution to combat these problems under the existing climatic condition. Keeping the above facts, Krishi Vigyan Kendra, Gwaldam (Chamoli) conducted large scale demonstrations at farmers' field on off season vegetable cultivation using black plastic mulching technology in five adopted villages during 2008- 2010 (three years) in order to extend the technology to vegetable growers and to assess its economic feasibility under hilly terraced land. The data revealed that the black plastic mulching advanced the harvesting of summer squash by 10 days, while in tomato and capsicum the advancement was of two weeks. The intervention increased the yield by 31.60 per cent in tomato also 46.69 per cent in summer squash. The maximum cultivation cost was observed in summer squash, while tomato cultivation under black plastic mulch was found to be the best with respect to net return and benefit-cost ratio (BCR). The maximum gain indicated in terms of IBCR values was maximum with summer squash (4.26), followed by tomato and capsicum. As a whole, the plastic mulching increases the production and productivity off season vegetable and help the vegetable growers in achieving the self sufficiency besides reducing the work load of women.

Keywords: Plastic mulch, Off-season vegetables, Demonstrations, Production economics

INTRODUCTION

The Uttarakhand is endowed with diverse agro-climatic conditions suitable for year round production of vegetables especially off-season vegetables in hills. Off-season vegetables provide higher economic returns per unit area and time compared to other agronomic crops from small and scattered land holdings (Singh *et al.*, 2008). Being off season nature, the vegetables produced at different altitudic zones during summer and rainy season are in great demand in the plains as well as in the nearby city markets. The concerted efforts of the Krishi Vigyan Kendras and other line departments linked with agriculture development in the State have resulted in expanding the area under vegetable cultivation in the recent past. However, various biotic (weeds, diseases and insect pests) and abiotic (low temperature, drought, rain-fed conditions with high or erratic rainfall, etc.) factors are major hurdle restricting the farmers in getting desired output and deterring the growers from this profitable business. Thus, off-season vegetables cultivation requires proper management against these biotic and abiotic barriers. Hence, protected cultivation tools *viz.* polyhouses, poly-tunnels, walk-in-tunnels, mulching, etc., becomes imperative in getting higher and quality produce with handsome returns. The higher construction cost and requirement of skill person restricts the poor and under educated vegetable farmers in adopting the greenhouse structure. Further, it is not possible to cover all the off-season vegetables area with greenhouse structures. Mulches are the grower's first line of defense in providing ideal conditions for plants and offers the cheapest and easiest tool of protected cultivation practices. Mulching, i.e. covering of soil surface around the plant, is an age old practice and can be done using various materials such as organic materials (dry leaf, paddy straw, dry leaves/twigs/grass, paddy husk, dry coconut leaves/husk etc.) as well as inorganic materials

(plastic films). Organic materials, though beneficial, were found to have inherent weaknesses in terms of required in large quantity besides collection and application in the field is labour-intensive. In contrast, easy availability, convenient in transportation and layout makes the plastic films as most preferred material for mulches. Amongst the mulches, black plastic is the most popular and widely acceptable as it controls weed population and increase the soil temperature to favourable extent under low temperature (Singh *et al.*, 2005). Krishi Vigyan Kendra, Gwaldam (Chamoli) initiated extensive research work and developed package of practices (POPs) for growing high value off-season vegetable under black plastic mulch in water scarce situation of Uttarakhand hills. Taking a step ahead in order to access the economic feasibility of mulching technology at farmers field, Krishi Vigyan Kendra, Gwaldam (Chamoli) conducted large scale demonstrations for growing off season vegetables *viz.*, summer squash, tomato and capsicum under black plastic film at rainfed mid hill of Garhwal Himalaya.

MATERIALS AND METHODS

The demonstrations were carried out by the Krishi Vigyan Kendra,Gwaldam, Distt.- Chamoli (Uttarakhand) during spring-summer seasons from 2008 to 2010 (three years) at the farmers' fields of five adopted villages *viz.*, Gwaldam (1950 m amsl), Talwari (1650 m amsl), Thala (1750 m amsl), Malbajwar (1600 m amsl) and Tharali (1200 m amsl) in mid to mid high hills of *Pindar* valley, Chamoli. The demonstrations were laid out with two treatments i.e. under black plastic mulch (demonstration plot- DP) and without mulch (farmers' practice- FP). The input supplied and practices were kept same for both the treatments (Table 1). The seedlings were transplanting on raised beds a day prior to transplanted, the beds were covered with 25 micron black plastic mulch (BPM) sheet. Small holes were made at appropriate distances as per planting geometry (Table 1). Observations were recorded for first harvest, marketable fruit yield, and harvest duration for all the three crops *viz.*, summer squash, tomato and capsicum.

The cost of cultivation was worked out considering fixed and variable cost incurred from seed sowing to transportation and marketing. The gross and net returns were worked out accordingly by taking the average sale price of produce during the periods of harvesting which were Rs. 500.00/q for summer squash, Rs. 800.00/q for tomato and Rs. 1400.00/q for capsicum. Additional cost in demonstration plots (DP) was calculated undertaking the additional expenditure incurred with respect to traditional practice in respective treatments i.e. expenditure incurred on weeding, hoeing and extra pesticidal sprays in unmulched plots (FP) and cost involved in plastic mulch purchase, its installation as well as extra expenditure involved in harvesting and transportation of additional yields under mulch. Benefit-cost ratio (BCR) was also calculated and economic viability of the technology was judged by working out incremental benefit-cost ratio (IBCR) which was calculated as a ratio of additional returns and corresponding additional costs incurred.

Table 1: Particulars showing the details regarding inputs and cultural practices followed under FLD for growing target vegetables

S.No.	Input/ cultural practice	Summer squash	Tomato	Capsicum
1.	Variety	Ducato	Avtar	Tanvi
2.	Nursery raising	Raised in polybags under poly-tunnels	Raised under poly-tunnels	Raised under poly-tunnels
3.	Manuring and fertilization	20 t FYM with NPK @ 150 kg, 100 kg and 120 kg/ha respectively	20 t FYM with NPK @ 180 kg, 80 kg and 100 kg/ha respectively	20 t FYM with NPK @ 120 kg, 80 kg and 100 kg/ha respectively
4.	Planting distance	100 cm x 75 cm	60 cm x 45 cm	50 cm x 50 cm
5.	Agromin (liquid micro-nutrient formulation for foliar sprays containing Zn, Fe, Cu and B)	Three sprays after flowering at 15 days interval (3.3 ml/ lit. of water)	Three sprays after flowering at 15 days interval(3.3 ml/ lit. of water)	Three sprays after flowering at 15 days interval(3.3 ml/lit. of water)
6.	Weeding and hoeing	2 hand weedings in FP.Not required in DP	03 hand weedings in FP.Not required in DP	03 hand weedings in FP.Not required in DP
7.	Plant protection measures	As per requirement	As per requirement	As per requirement

RESULTS AND DISCUSSION

Results of demonstrations at farmers' fields indicated that black plastic mulch (BPM) significantly influenced the plant growth and yield attributes (Table 2). The black plastic mulch advanced the harvesting of summer squash by 10days whereas, the advance was of order of two weeks in tomato and capsicum to the crop grown under without mulch cover. Besides, advancing the harvesting time the black plastic mulch also gave significantly higher fruit yield than traditional approach, a fruit yield of 578.70, 404.30 and 215.25 q/ha was obtained in demonstration plots against 394.50, 307.20 and 152.60 q/ha in farmers' practices in summer squash, tomato and capsicum, respectively. Thus, the use of mulching results in 46.69 per cent, 31.60 per cent and 41.05 per cent higher yield in summer squash, tomato and capsicum, respectively. The earliness and higher yield under black plastic mulch in DP fields owed its success to the inherent advantages of BPM *viz.*, soil and moisture conservation, suppression of weeds, improved nutrient availability and prevention against drastic variation in soil temperature leading higher uptake of nutrients under favourable microclimatic condition resulting in better vegetative growth, higher and early yield. BPM has an additional advantage over other coloured mulches that it does not allow photosynthesis under the film and therefore weed growth is depressed. Reduction in labour requirement and drudgery is the additional advantage of mulch in women dominated hill agriculture (Singh and Singh, 2009). The plastic mulching also prolongs the harvesting time by 18 days in summer squash, 19 days in tomato and 25 days in capsicum than farmers practices (Table 2). This may be attributed to the fact that mulch film provides a better environment for root growth and conserves adequate moisture for the plants (Singh and Singh, 2010) which helps in maintaining proper cell turgidity and higher meristematic activity eventually leading to more foliage development and consequently better plant growth with less stress to plants.

The economic analyses of three important off season vegetables cultivated under BPM were carried out to analyze the economic feasibility of the technology (Table 3). Cost of cultivation, gross return, net return and benefit-cost ratio (BCR) for all the three crops were calculated under both the growing environments i.e. under mulch (DP) and without mulch (FP). The maximum cost of cultivation was observed in summer squash i.e. Rs. 122250.00/ha for DP and Rs. 100650.00 for FP followed by capsicum (Rs. 111300.00/ha for DP and Rs. 86800.00 for FP) and tomato (Rs. 107500.00/ha for DP and Rs. 83600.00/ha for FP). However, tomato was the most profitable in terms of gross, net returns and benefit-cost ratio (BCR).Maximum BCRs was also recorded with tomato (3.01 for DP and 2.94 for FP) followed by capsicum (2.71 for DP and 2.46 for

Table 2: Effect of BPM on earliness, yield and harvest duration of summer squash, tomato and capsicum

Crop	Days to first harvest		Fruit yield (q/ha)		% increase over control	Harvest duration	
	DP	FP	DP	FP		DP	FP
Summer squash	42	52	578.70	394.50	46.69	83	65
Tomato	68	83	404.30	307.20	31.60	79	60
Capsicum	63	77	215.25	152.60	41.05	90	65

Table 3: Economics of the use of BPM in summer squash, tomato and capsicum production

Crop	Cost of cultivation (Rs.)		Gross return (Rs.)		Net return (Rs.)		BCR		Additional yield (q/ha)	Additional cost (Rs.)	Additional return (Rs.)	IBCR
	DP	FP	DP	FP	DP	FP	DP	FP				
Summer squash	122250.00	100650.00	289350.00	197250.00	167100.00	96600.00	2.37	1.96	184.20	21600.00	92100.00	4.26
Tomato	107500.00	83600.00	323440.00	245760.00	215940.00	162160.00	3.01	2.94	97.10	23900.00	77680.00	3.25
Capsicum	111300.00	86800.00	301350.00	213640.00	190050.00	126840.00	2.71	2.46	62.65	24500.00	87710.00	3.58

FP) and summer squash (2.37 for DP and 1.96 for FP). The additional costs involved in cultivation of summer squash, tomato and capsicum cultivated under mulch (DP) varies as Rs. 21600.00, Rs. 23900.00 and Rs. 24500.00 per crop cycle, respectively. Additional returns and incremental benefit-cost ratio (IBCR) were also calculated for the technological intervention (mulch). IBCR values clearly indicated a net gain of Rs. 4.26 in summer squash, Rs. 3.25 in tomato and Rs. 3.58 in capsicum against the per rupee invested for the adoption of plastic mulch technology.

The experiences related to impact of Front Line Demonstrations of different technologies on production economics of different crops have been reported by many extension scientists. Singh and Agrawal (2013) reported 23 to 25% yield enhancement of okra in demonstration plots as compared to local check. Similarly, Chauhan *et al.* (2013) reported increase in yield level ranging from 20.91 to 31.30% in the demonstration plots of chickpea as compared to farmers practice.

CONCLUSION

From the results of above demonstrations it can be inferred that the use of BPM in off-season cultivation of important vegetables would substantially increase the overall farm income as well as improve livelihood of the resource poor farming community of the Uttarakhand hills. It is further suggested that sincere extension efforts are required to educate the farmers for adoption of this technology. Initial cost involved in purchasing and installation of plastic mulches would be the hindrance in large scale adoption of this technology by the farming community in initial stage. To overcome this barrier, the Government of India has provided subsidy @ 50% under National Horticulture Mission (NHM) and Horticulture Mission for North East and Himalayan States (HMNEH) for adopting this technology. The scheme is implemented through Department of Horticulture, Uttarakhand. Thus, adoption of mulching technology will not only increase the area under off season vegetables cultivation but will also benefit the consumer in getting quality vegetables round the year at affordable price and grower will get the better return and improves his socio-economic status.

REFERENCES

Chauhan, R.S., S.R.K. Singh, Y.D. Mishra, P. Singh, M.K. Bhargava and H.P. Singh. 2013. Impact Analysis of Front Line Demonstrations (FLDs) on Gram (Chickpea) in Shivpuri District of Madhya Pradesh. *Journal of Community Mobilization and Sustainable Development*, **8**(2): 205-208.

Singh, B., M. Kumar and G.C. Singh, 2005. Effect of different plastic mulches on growth and yield of winter tomato. *Indian Journal of Horticulture*, **62**(2): 200-202.

Singh, G. and R.P. Agrawal. 2013. Impact of Front Line Demonstration of Improved Okra Cultivation Technology. *Journal of Community Mobilization and Sustainable Development*, **8**(2): 291-293

Singh, V.P. and P.K. Singh. 2009. Effect of coloured poly mulches on growth and yield of summer squash under mid-hill condition of Uttarakhand. *In: Proc. 4th Uttarakhand State Science and Technology Congress*, Pantnagar, November 10-12, pp. 20.

Singh, V.P. and P.K. Singh. 2010. Enhancement of earliness and productivity in summer squash and tomato using plastic mulches through front line demonstrations in mid-hills of Uttarakhnad. *In: Proc. of National Symposium on Conservation Horticulture-2010*, March 21-23, Dehradun, pp. 302.

Singh, V.P., A.S. Jeena, and P.K. Singh. 2008. Black polyethylene mulch for cultivation of off-season vegetables in Uttarakhand hills. *Proceedings of Nat. Work. On App. Tech. For Hills* held on 16-18 Oct., 2008 at GBPUAT, Pantnagar, pp. 357-359.

Received on November, 2013, Revised on September, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 159-162, July-December, 2014

Analysis of Drudgery Load Faced by Farm Women in Cotton Production System

Narinderjit Kaur and Anjuly Sharma
AICRP, Department of Family Resource Management, COHS, PAU Ludhiana, Punjab

ABSTRACT

Cotton, commonly known as "White Gold" is one of the most important fibre crops and plays a key role in the economic and social affairs of the world. India ranks number one in the world accounting for twenty percent of the total area (119.78 lakh hectares). The conventional method of harvesting i.e. hand picking of cotton is a drudgery prone activity and causes occupational hazards like finger injuries. Hundred percent of sample were involved in weeding and harvesting activities of cotton production system. The drudgery load in this production system was characterized for finding suitable solutions to minimize the same. Both weeding and harvesting activities were characterized by six factors: physical load, postural drudgery, repetitive strain, physiological load, duration and muskulo-skeletol disorders (MSD). In weeding activity, repetitive strain, physiological load and muskolu-skeleton disorders contributed more towards drudgery of farm women and in case of picking of cotton activity, physical load, postural stress and time were contributed more.

Keywords: Muskulo-skeletol disorders, Drudgery, *Khurpa*

INTRODUCTION

The Family Resource Management(FRM) component at Punjab Agricultural University (PAU) centre is working on two production systems i.e. cotton cultivation and flower (rose) cultivation for characterization of drudgery of farm women under All India Coordinated Research Projects (AICRP) in Home Science. These two production systems have been chosen because these are important crop diversification programmes at the state level. Punjab is famous for producing large quantities of high quality cotton i.e. twenty one lakh bales (1 bale = 170 kg), most of which is exported and marketed either as raw material or in the form of yarn. Punjab, being third, in its contribution of cotton crop to the national pool indicates intensive involvement of rural women in cotton picking and they spend approximately 8-9 hrs in this activity. Further, they perform this activity with drudgery prone conventional methods thus putting large demands on their time and energy. Crop calendar for cotton falls from April to December. The weeding is mostly performed during Jul- August and women perform this activity with a hand tool commonly known as *Khurpa* in squatting position. Picking of cotton is a seasonal and women exclusive activity. The conventional method of harvesting i.e. hand picking of cotton is a drudgery prone activity and causes occupational hazards like finger injuries. In this production system, weeding and harvesting are the activities performed by women. The harvesting in this production system is performed in standing posture and is performed by bare hands. The posture sometimes varies from standing to standing-cum-bending due to variation in height of the plants. The drudgery load in this production system was characterized for finding suitable solutions to minimize the same. The activity wise and factor wise drudgery load of women during cotton cultivation has been discussed in this paper.

MATERIALS AND METHODS

A total of 30 farm families were taken as respondents from Pakhowal block of Ludhiana district of Punjab state where about 128 acres of land was under cotton cultivation. Only thirty women respondents were selected purposively for this study so as to analyze her work load.

RESULTS AND DISCUSSION

The drudgery load in this production system was characterized for finding suitable solutions to minimize this load. The activity wise and factor wise drudgery load of women during cotton cultivation has been discussed as follows:

1. Activity wise drudgery load: Both weeding and harvesting activities were characterized by six factors: physical load, postural drudgery, repetitive strain, physiological load, duration and muskulo - skeletol disorders (MSD).

(a) Physical load: Regarding physical dimension, it was told that this activity was women exclusive (WE). For weeding *Khurpa* was used by women and majority were unsatisfied by this use. Average weight of *khurpa* was found to be 0.25 kg; they carried this weight from home to field with in the average distance of 0.27 kms and kept *khurpa* in their hands above the ground at an average distance of 0.493 mts. (Table 1).

By calculating individual scores of 30 respondents, average physical load rating was found to be 2.46 and it falls in the category of low level, which indicates that physical load of *khurpa* was found negligible as weight of *khurpa* was not difficult to carry. Mean physical load factor was noted as 1.97.

Regarding picking of cotton, farm women used knotted cloth *(jholi)*. The complete harvesting included 2 to 3 pickings with a couple of days break between the two pickings. Women on an average picked at a speed of 3 to 4 kg per hour. Distance travelled was one hour. Average weight of *jholi* (filled with cotton) was found to be 3.45 kg and height lifted from ground was observed as 1.42 mts. in an area of 0.46 kms. For weeding activity, physical load rating was found to be 2.5 which was moderately heavy.

Therefore, it can be concluded that drudgery load was found higher in picking activity as compared to weeding activity.

(b) Postural drudgery: Second factor included was postural. Nature of posture adopted by all respondents was squatting. During this activity, head, neck, shoulder, upper arm, lower arm, waist, lower legs and lower back were involved. Sum of discomfort rating was found to be 19 and average discomfort rating was rated as 3.02 i.e. of moderate level, which means that posture plays a very important role as far as weeding is concerned. The stress was also observed in hands and forearms as it is handy task and while handling *khurpa*, hands got injury due to compression forces on hands.

In picking activity, nature of posture adopted by most women was standing with slight bending also. Average discomfort rating was found as 3.45, which is higher to weeding activity. More number of body parts were involved in picking activity (3.37) as compared to weeding (2.17) of cotton. Thus, concluded that postural drudgery was seen more in picking of cotton as compared to weeding of cotton (Table 2).

Table 1: Physical Load drudgery of respondents observed in selected activities (n = 30)

Farm activity	Gender participation	Technology usage			Weight of the load (kg)	Distance carried (km)	Height lifted (mts)	Physical load rating	Physical load factor	Physical load
		Technical name of the tool	Local name of the tool	Satisfaction level						
Weeding (Plant to Plant)	WD	Weeding hoe	*khurpa*	US	0.25	0.27	0.493	2.46	1.97	0
Picking	WE	Knotted cloth	*jholi*	US	3.45	0.46	1.42	2.23	2.5	0

Table 2: Postural drudgery of respondents observed in both selected activities (n = 30)

Farm activity	Nature of posture	Body part involved along with Discomfort rating (score sheet)													Total no. of body parts involved	No. of zeroes	Body parts involved	Sum of discomfort rating	Average discomfort rating	Posture load factor	Posture load
		Head	Neck	Shoulder	Upper arms	Lower arms	Chest	Abdomen	Waist	Hips	Upper legs	Lower legs	Upper back	Lower back							
Weeding (Plant to Plant)	4	2.8	3.5	2.67	3.2	4	0	0	2.4	0	0	0	0	0.9	13	6.57	6.43	19.4	3.02	2.17	6.50
Picking	1.3	3.4	3.3	3.33	2.7	3	0	0	3.7	0	0	2.4	0	3.7	13	5.57	7.43	25.6	3.45	3.37	11.59

(c) Repetitive Strain: Weeding activity was found to be repetitive in nature; its rating was found to be 3.9 which indicates exhaustion due to continuous work involvement by rural women. Nature of repetitive strain in both activities was same i.e., continuous. Repetitive strain rating was found higher in weeding (3.9) as compared to picking (3.4) which indicates that weeding activity was highly exhausting and picking of cotton was moderately exhausted. Repetitive strain load factor was found to be same in both activities and repetitive strain load was higher in weeding activity (Table 3).

Table 3: Repetitive Strain load of respondents observed in both selected activities (n=30)

Farm activity	Nature	Repetitive strain rating	Repetitive strain load factor	Repetitive strain load
Weeding (Plant to plant)	1	3.9	2.4	10
Picking	1.3	3.4	2.4	8

(d) Physiological load: As regards the physiological load its rating was found as 4.0, which means it is in heavy level for weeding activity. Physiological load factor was found as 2.3 for weeding activity and for picking it was noted as 1.4, and physiological load was higher in weeding activity than picking which indicates that physiological drudgery load of weeding was higher as compared to picking activity (Table 4).

(e) Duration: Weeding is done oftenly as they need to be eradicated timely. It is highly time consumable activity and needs more working hours at regular intervals. Average number of days involved in weeding found to be 8.83. Number of labour employed was 2.13, number of man days was 8.83. The temporal work load was found to be 3.1. Time load factor was rated as 1.93 and time load was found to be 10.77. It can be observed that time is a factor which value most in any farm activity. If tool is user friendly and according to women's anthropometry, time can be saved to a greater extent (Table 5).

Table 4: Physiological load of respondents observed in both selected activities (n=30)

Farm activity	Physio-logical load rating	Physio-logical load factor	Physio-logical load
Weeding (Plant to Plant)	4.0	2.3	9.1
Picking	3.93	1.4	5.7

Regarding picking activity, average number of days involved (13.63) were more than weeding activity (8.83). Work load as per time was also found to be more in picking activity (3.2) than weeding of cotton (3.1). Therefore, it can be concluded that time/duration drudgery load was found to be higher in picking activity.

(f) Muskulo-Skeletol Disorders: While performing weeding activity various body parts involved were: head, neck, shoulder, Lower arm, waist, and wrist. Main stress was done upon wrist, lower arm. Sum of discomfort rating was found to be 59.7 in weeding as compared to picking activity which was found to be as 42.3, average pain rating was calculated as 9.95 in weeding and 7.05 for picking activity, MSD load factor was rated as 3.6 for weeding and 3.3 for picking and MSD load was observed as 8.43 in case of weeding activity and 6.66 in case of picking activity. This factor was contributed more towards drudgery of farm women involved in weeding activity (Given in table no. 6).It is concluded that, in weeding activity repetitive strain, physiological load and muskolu-skeleton disorders contributed more towards drudgery of farm women and

Table 5: Duration involved for selected activities by the respondents (n =30)

Farm activity	Duration/Time						
	Hours /day	No. of days/acre/ season	No. of labour employed (incl. self)	No. of man days /season	Work load as per time	Time load factor	Time load
Weeding (Plant to Plant)	8	8.83	2.13	08.83	3.1	1.93	10.77
Picking	8	13.63	2.26	13.63	3.2	1.97	09.50

Table 6: Muskulo- skeletol disorders observed during weeding and picking activities by the respondents (n = 30)

Farm activity	Head	Neck	Shoulder	Upper arms	Lower arms	Chest	Waist	Abdomen	Hips	Upper legs	Lower legs	Upper back	Lower back	Wrist	Feet	Total no. of body parts	No. of zeros	Body parts involved	Sum of discomfort rating	Avg pain rating	Scoring	MSD load factor	MSD load
Weeding (Plant to Plant)	9.1	8.9	4.8	0	15.3	0	6.3	0	0	0	0	0	0	15	0	15	9	6	59.7	9.95	2.366667	3.6	8.433333
Picking	3.9	8.5	8.1	0	0	9.17	2.5	10	0	0	0	0	0	0	0	13	7	6	42.3	7.05	2.033333	3.3	6.666667

Table 7: Drudgery load of six factors for cotton production system (n = 30)

Farm activity	Physical load	Posture load	Repetitive strain load	Physiological load	Time load	MSD load	Total drudgery load
Weeding (Plant to Plant)	0	6.530952	9.5	9.066667	10.76667	8.433333	44.29762
Picking	0	11.59048	8.2	5.733333	9.5	6.666667	41.69048

in case of picking of cotton activity, physical load, postural stress and time were contributed more.

2. Factor wise drudgery load: It is clear that physical factor contributed least (0) and time load factor is most contributing amongst all. Drudgery load was found more on weeding activity of cotton production system (Table 7).

CONCLUSION

This study shows that out of six factors, physical load, postural drudgery, repetitive strain, physiological load, duration and muskulo-skeletol disorders (MSD), the most contributing factor for drudgery was duration as weeding and picking is a time consuming activity. It leads to Muskulo-skeletol disorders and it is a widespread problem in agriculture for more than a decade. Women has different ergonomically characteristics than man, design of women friendly tools and equipment is required. Work station should be adjustable to make it comfortable for woman during performing agricultural activities.

REFERENCES

Gite, L.P. and Majumdar. 2005. *Woman Friendly Improved Farm Tools and Equipment*. Progress Report of AICRP on Human Engineering and Safety in Agriculture of Bhopal Center 2005.

Hasalkar, S., S. Rajeshwari and R. Budihal. 2007. Musculo-skeletal Disorders of the Farm Women While Performing the Top Dressing of Fertilizer Activity. *Journal of Human Ecology*, **21**(2): 109-112.

Received on July, 2013, Revised on July, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 163-166, July-December, 2014

Status of Women in India: An Overview

Nishu Sharma
Department of Economics and Sociology, Punjab Agricultural University, Ludhiana, Punjab

ABSTRACT

The economic independence is regarded to be the prime basis for enhancing the status and position of women at home as well in society. Government is playing a significant role in improving sex ratio by implementing several laws. But, due to socio-cultural and economic reasons, problem still persist. This paper reviews status of women in rural and urban India based on secondary census data. Lack of adequate resources prevents women from poorer households using health services. Poor sanitation, unhygienic surroundings and difficulty in procuring safe drinking water are some additional factors that affect the general health of women. The representation of women at the grassroots level has improved significantly. But at the higher rung it is dismal. As the literacy rate is improving in rural settings but when it is compared with urban area it is still lacking behind.

Keywords: Child marriage, Jauhar, Pratha, Purdah, Sati, Women

INTRODUCTION

The status of women in India has been subjected to many great changes over past few millennia. Women in India are still exposed to numerous social issues. Though crime against women like a rape, molestation, honour killing, incidences of domestic violence are also reflective of women status in society. Women held very important position in ancient Indian Society. In ancient times women enjoyed a position of respect and reverence. Women equally participated in religious ceremonies. There was no seclusion of women from social affairs but they were dependent on males throughout their lives. The Indian women's position in the society deteriorated during medieval period. Social evils like *Sati* and *Jauhar* Pratha were practiced. Child marriage and ban on widow remarriage became part of social life. One of the reasons as to why many widows opted for Sati is the status of widow in India was deplorable in that they were not allowed to participate in any religious and social function. The veil or the Purdah system was widely prevalent in medieval Indian society. This system curtailed the freedom of women.

Raja Rammohan Roy's efforts led to the abolition of the Sati practice. Sati was first abolished in Calcutta in 1798. Ishwar Chandra Vidyasagar's crusade for the improvement in condition of widows led to the Widow Re-marriage Act of 1856. In 1917, the first women's delegation met the Secretary of State to demand women's political right supported by the Indian National Congress. Women in India now participate in all activities such as education, sports, art, politics, service, medicine, tourism and hospitality etc. Women in modern India have largely been influenced by the programmes of reforms and upliftment which brought about a radical change in their position. It has been firmly established that women in India are vital and productive contributors to the national economy but their access to knowledge, skills, resources, opportunities and power still remain rather low (Kukmari, 2009). There is a major change seen in the lives of women themselves and also in perception of their roles and functions by society but for them, there is still long way to go.

VARIABLES OF WOMEN'S STATUS

There are four major variables of women's status:

Education: There has been rapid increase in education of girls and women in recent decades in rural and urban areas. Discrimination in access to education does exist but with economic progress of the family, while the boy is given the first opportunity to go to school, the girl follows the same path. Again the notion of man being

the primary earner has not been dismantled and is still embedded in the cultural value system of middle class; in poor families women make equal or more than half contribution towards the household economy. However, women's right and need to pursue their career and to have their own independent income and personality development has begun to be accepted and respected even by the middle classes.

The effect of rapid increase in the education of girls is still to be felt because of almost decade and a half of gestation period required between changes in the attitude towards education of girls and expansion of facilities for education. But increase in the number and proportion of girls at different levels of education and tremendous drop in dropout rates indicate a strong trend in education of girls not only as a social obligation, of getting educated grooms, but with a long-term need for their developing into empowered human being. Although the literacy rate among women is improving but still there is gap among two genders (Fig. 1). As the literacy rate is improving in rural settings but when it is compared with urban area it is still lacking behind and when it is compared on the basis of gender, the difference between them is still identified (Table 1).

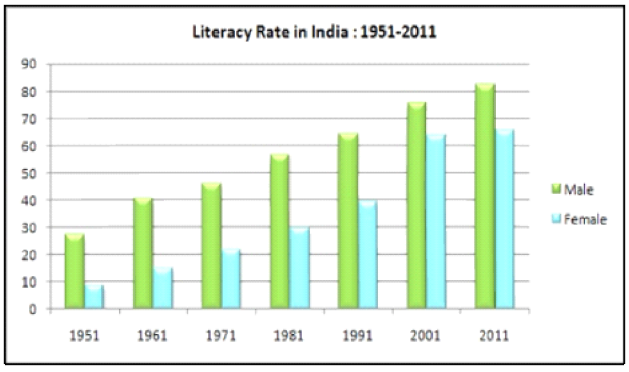

Fig. 1:

Table 1: Gender-wise gap in rural and urban literacy rates in India

Year	Rural			Urban		
	Male	Female	Gap	Male	Female	Gap
2003	71	48	23	88	74	14
2004	72	50	22	88	75	13
2006	75	52	23	88	77	11
2007	76	54	22	89	77	12
2011	79	59	20	90	80	10

Dropout rate of girls is mainly affected by changing socio-economic conditions of the family. The main reasons of females never attending school are: expensive cost of education, not interested in studies, education is not considered necessary and required for household work (NFHS-III, 2005-06). Factors for low female literacy rate are: gender base inequality, absence of school teachers, school establishment in faraway places, social discrimination and economic exploitation.

Women's Health: The maternal mortality is very high as females are not givenproper attention, which results in the malnutrition. Marriage at early age leads to pregnancies at younger age. It is not just the poor but also in well-to-do families' parents tend to spend more for son preference. Women are more anaemic than men. Shortage of health care personnel and absence of timely transportation to the nearest hospitals is major problem.Only 50.7 percent mother has at least 3 antenatal visits for last birth and big portion did not avail this facility. Approximately 60 percent of women (NFHS 3) did not go for institutional births (Table 2). Lack of adequate resources prevents women from poorer households using health services. Undernourished, ill-fed and overworked, most women from such households are extremely vulnerable to ailments and disease, which may not be properly diagnosed and treated. Poor sanitation, unhygienic surroundings and difficulty in procuring safe drinking water are some additional factors that affect the general health of women. Effective implementation of PNDT Act (1994) need to be practiced.

Employment: The status of women in any society does not have an economic interpretation only. The economic status finds its roots in the patriarchal society. The process of economic development alone cannot bring a positive change in the working patterns of the women. They are still being employed in low paid and less secure jobs. In present economic world, if we witness an increase in female participation in work force then we will also witness a larger increase in their participation in the informal sector jobs. The economic independence is regarded to be the prime basis for enhancing the status and position of women at home as well in society. The type and extent of participation by farm women in farm operations vary from state to state. The women have to help the farmer in his traditional tasks of ploughing, interculturing, harvesting, irrigation, after care and post-harvest operations.

Table 2: Antenatal and post-natal health status

Antenatal and post-natal care (%)	Data source		
	NFHS I (1992-93)	NFHS II (1998-99)	NFHS III (2005-06)
Mothers had at least 3 antenatal care visits for last birth	43.9	44.2	50.7
Mothers consumed IFA > for 90 days	-	-	22.3
Births assisted by a doctor/nurse/LHV/ANM/other health personnel	33	42.4	48.3
Institutional births	26.1	33.6	40.7
Mothers received postnatal care from doctor/nurse/LHV/ANM/other health personnel within days of delivery for last birth	-	-	36.4

Source: NFHS

Women involvement in transplanting, weeding, *i.* and winnowing was reported more than 90 per cent (Nain and Kumar, 2010). Generally, women are hired as extra hand during sowing, dibbling, interculturing, harvesting and threshing periods.

Table 3: All India labour force participation rates and worker population ratios, usual status, over time

Parameter	1993-94	1999-2000	2004-05
Labour Force Participation Rates (%)			
Rural Male	56.1	54.0	55.5
Rural Female	33.1	30.2	33.3
Urban Males	54.3	54.2	57.0
Urban Females	16.4	14.7	17.8
Worker Population Ratios (%)			
Rural Male	55.3	53.1	54.6
Rural Female	32.8	29.9	32.7
Urban Males	52.1	51.8	54.9
Urban Females	15.5	13.9	16.6

The work profile ratio for women in urban areas is nearly half what it is in rural areas (Table 3). This is largely due to the nature of India's rural economy which depends critically on agriculture and animal husbandry that utilize substantial segments of unpaid family labour. This aspect remains the same even for the non-farm activities undertaken by rural households. In urban areas too women undertake unpaid work in family enterprises or contract work as home-base workers in a host f manufacturing related activities. The concentration of women workers in primary sector activities such as agriculture, forestry, fishing, etc., continues in spite of a marginal decline (86 per cent to 83 per cent) over the years. However, the actual numbers, as well as, share of women workers compared to men is increasing, reflecting the feminization of agriculture.

Political participation: The term political participation generally refers to those voluntary activities of members of a society, in the selection of rulers and formation of public policy. Equal treatment to women in political life, to be meaningful and effective, should start from the grassroots level. To provide training and practice in the process of decision-making, the rural democratic institutions are the ideal structures to begin with. As a result of 73rd and 74th amendments of the Constitution (1992), one third of the seats in all elect bodies from the village Panchayat to the district levels are reserved for women (Fig. 2). Large majority of the women who have entered these institutions are either illiterate or have very little formal education. Women reservations of 33% in parliament seats are still pending. Overall percentage of women parliamentarians stands at 10.96%.

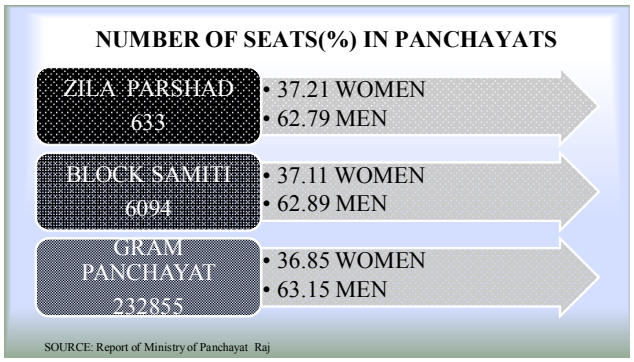

Fig. 2:

CONCLUSION

Although women literacy is improving, but still they are lacking behind males and position of rural women is more venerable. Government is playing a significant role in improving sex ratio by implementing several laws and schemes. But, due to socio-cultural and economic

reasons, problem still persist. Lack of adequate resources prevents women from poorer households using health services. Poor sanitation, unhygienic surroundings and difficulty in procuring safe drinking water are some additional factors that affect the general health of women. The representation of women at the grassroots level has improved significantly. But at the higher rung it is still dismal.

REFERENCES

Annual Report. 2012-13. Ministry of Women and Child Development, Government of India.

Government of India (GOI). Eleventh Five year Plan. 2007-12. Planning Commission, New Delhi.

Kukmari, V. 2009. Profile of Women Entrepreneurs: Indicators of Empowerment. *Journal of Community Mobilization and Sustainable Development*, **4**(2): 63-67.

Mahapatro, S.R. 2013. Declining Trends in Female Labour Force Participation in India: Evidence from NSSO (National Sample Survey Organisation).

Mohanty B. Women and Political Empowerment (Ed.), New Delhi (2000). Institute of Social Sciences.

Nain, M.S. and P. Kumar. 2010. A study of women participation and decision making in farmer management. *Journal of Community Mobilization and Sustainable Development*, **5**(1): 67-71.

National Family Health Survey -1, 2 &3. Ministry of Health and Family Welfare, Government of India.

NSSO (National Sample Survey Organisation) 2006. Employment and Unemployment in India 2004-05.

Rustagi, P. 2010. Employment Trends for Women in India, New Delhi.

Received on February, 2014, Revised on August, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 167-171, July-December, 2014

Work Behaviour of Development Personnel: A Study of an NGO Working in Remote Hills of Uttarakhand

Netrapal Malik
Krishi Vigyan Kendra (CS Azad University of Agriculture and Technology, Kanpur) C.D.F. Complex, Anoop Shahar Road, Chherat, Aligarh-202122, Uttar Pradesh

ABSTRACT

Work behaviour of employees of an NGO working in Hills of Uttarakhand named 'Central Himalayan Rural Action Group (CHIRAG)' was studied. Sample size of the study comprises of 132 employees of the organisation. It was found that majority of the employees were of middle age, married, from rural background, working at low salary with low career and salary progression, got first job at young age and have not changed any organization in spite of not getting even a single promotion while having high experience. Majority of the employees have indicated high centrality of work and family, high level of job affect but medium level of job clarity and achievement motivation. Employees have given more importance to altruism, achievement, ability utilization and peace of mind values. These values of the employees were found being satisfied by working with CHIRAG. Most of the employees of the organization were satisfied with their life and job.

Keywords: Work behavior, Centrality of work and family, Job affect, Job and life satisfaction, Achievement motivation, Values expectancies, NGO

INTRODUCTION

Voluntary sector has always played an important role in society from the time immemorial. The concept and approach in voluntary work has undergone many changes from time to time. From pure charity, relief and welfare oriented approach this sector has in recent times suitably modeled and equipped itself to meet the development needs of the society. There is hardly any field which is not now touched by NGO sector/ voluntary sector (Gangrade, 2001). The NGOs with their advantage of non-rigid, locality specific, felt need-based, beneficiary oriented and committed nature of service have established multitude of roles which can effect rural development (Bhaskar and Geethakutty, 2001). Now, NGOs are being supported more and more by the central and the state government. They are neither anti-state agencies, nor a substitute for the state. Several programmes and activities are being supplemented by the NGOs and several programmes and activities are being assigned to the NGOs by the state. The Government is now of the view that it alone cannot perform everything for the people (Bhattacharya, 1987).

It has been observed from the literature reviewed that studies on work behaviour of personnel in Indian NGOs context are negligible. However, it requires much attention as work behaviour of NGOs personnel is great determinant factor in implementation of developmental projects and in turn overall rural development. Therefore, it was felt to analyse the workforce engaged in NGO sector. A study was conducted in an NGO working in remote hills of Uttarakhand to describe the general profile of the personnel employed in the organisation and to analyse their work behaviour.

MATERIALS AND METHODS

The non-governmental organisation Central Himalayan Rural Action Group (CHIRAG) working in Nainital district of Uttarakhand was selected for the study on the basis of its larger size, penetration at grass-root level and existence of well-defined hierarchy in the organisation .A structured questionnaire was given to all the 102 full- time employees and 50 per cent of part-time employees (i.e. sixty four) of the organisation to gather the desired data. However, the filled

questionnaire was returned by ninety- four full time employees and thirty- eight part time employees. Thus, sample size of the study was 132. The quantitative data collected through questionnaire was also supported by qualitative data collected by in-depth interview of team leaders of each project being run by the organisation. Secondary data about the organisation was gathered from the annual reports of the organisation.

Employees' general profile related variables were age, sex, educational level, background (rural/urban), marital status, age at first job, gross salary of first job, present gross salary, change in organisations, promotions, experience in the organisation, total experience, career progression and salary progression. The variables considered under work behavior were centrality of work, centrality of family, job affect, job clarity, importance given to values, value expectancies, achievement motivation, job satisfaction and life satisfaction. Career progression was calculated dividing the number of promotions of an employee by the total years of his/her work experience and multiplying by 100. Salary progression was calculated subtracting the first salary from present salary of an employee and dividing by total years of his/her work experience. Centrality of work was understood as the importance given to work in the life by organisational personnel. It was measured with a circle (of 24 mm radius) in which organisational personnel were asked to locate their centrality of work, assuming the circle to be their life space. Centrality of family is the importance given to family in the life by organisational personnel. It was measured same as centrality of work was measured. Job affect is perceived as a measure of how the organisational personnel feel about their specific jobs. Job clarity refers to the personnel's clarity of information about his/her authority, rights, responsibilities, guidelines for making decisions, quality of their performance, and expectations of the organisation etc. The variable value expectancies means chance to realize an important value with the help or anticipated help of work. It is the product of importance attached to a value and the probability of the value being realized through work experience (Sinha, 1990). The values scale developed by Super and Nevill (1986a) and modified by Sinha (1990) as per Indian cultural context was used to measure the importance given to values. The values studied were as ability utilisation, achievement, advancement, aesthetics, altruism, autonomy, authority, creativity, economic rewards, life style, personal development, physical activity, prestige, risk, social interaction, social relation, variety, working conditions, peace of mind, comforts of life, and dependency. Achievement motivation was measured with the help of scale developed by Reddy (1978).

RESULTS AND DISCUSSION

General profile of the organisational Personnel: There were total 102 full time employees working in the organisation, out of whom sixty were permanent and forty-two were project based. In addition to full time staff, 128 villagers were working as part time staff in the organisation as forest caretakers, *balwadi* workers, environmental education teachers, librarians, community workers, community technicians, community health workers, village *dais* (midwives), etc. Amongst the full time staff, beside Executive Director, CHIRAG has adopted four levels of hierarchy viz., Team Leaders, Development Associates, Development Assistants and Extension Workers.

Majority of the employees of the organisation were of middle age and married. Male: female ratio was 4:1. Overwhelming majority of employees was from rural background working at low salary with low career and salary progression in spite of having high experience (Table1). Few respondents were found to have negative salary progression. One forth employees were educated up to 8th standard and almost similar proportion of employees was under-graduate. Percentage of employees with education up to high school and post-graduation were also almost similar; i.e., 18.93 and 17.42, respectively (Table 1). Part- time workers of the organisation were having less educational level. Employees at middle hierarchy were either graduate or postgraduate in art group subjects. Most of the personnel at upper hierarchy were from urban background and having professional post-graduate qualifications.

Majority of the employees of the organisation got first job at young age (19 to 32 years) and they have not changed any organisation in spite of getting any promotion (Table 1). During qualitative data collection, it was found that most of the employees of the organisation were from local villages. In the initial stage of the organisation, youth from local villages were kept on contract basis. These youths were not having any professional qualification, but CHIRAG continued

Table 1: General profile of organisational personnel (n=132)

S. No.	Aspect of general profile	No. of respondents	Percentage
1.	**Age**		
	Young (below 23)	8	6.06
	Middle (24 to 43)	84	63.63
	Old (above 44)	40	30.30
2.	**Background**		
	Rural	117	88.63
	Urban	15	11.36
3.	**Marital status**		
	Married	90	68.18
	Unmarried	42	31.81
4.	**Educational level**		
	Upto 8th	34	25.75
	High School	25	18.93
	Intermediate	17	12.87
	Graduate	32	24.24
	Post Graduate	23	17.42
	Doctorate	1	0.75
5.	**Age at first job**		
	Very young (below 23)	21	15.90
	Young (24 to 43)	97	73.48
	Old (above 44)	14	10.60
6.	**Change in organisation**		
	No change	109	82.57
	One time change	14	10.60
	Two time change	7	5.30
	Three time change	1	0.75
	Four time change	-	-
	Five time change	1	0.75
7.	**Number of promotions**		
	No promotion	87	65.90
	One promotion	18	13.63
	Two promotions	16	12.12
	Three promotions	8	6.06
	Four promotions	3	2.27
8.	**First salary**		
	Low	127	96.21
	Medium	3	2.27
	High	2	1.51
9.	**Present salary**		
	Low	112	84.84
	Medium	18	13.63
	High	2	1.51
10.	**Career progression**		
	Low	98	74.24
	Medium	29	21.96
	High	5	3.78
11.	**Salary progression**		
	Low	110	83.33
	Medium	14	10.60
	High	8	6.06
12.	**Total experience**		
	Low	50	37.87
	Medium	28	21.21
	High	54	40.90

working with them. Due to long experience in the organisation and continuous task specific in-service trainings, these local people became proficient in development work and the organisation kept them as permanent employees. Few among them had been promoted up to the cadre of policy planner. Highlighting the importance of in-service trainings Tiwari *et al.* (2011) also reported in their study that regular in-service trainings should be organised for refreshing knowledge and skills of lower level officials of State Department of Animal Husbandry (SDAH) of Uttar Pradesh and Uttarakhand.

The strategy of recruiting non-professional local youth and making them proficient in development work through continuous in-service trainings might be helpful in employment generation at local level and availing human resource at low cost. NGOs mostly depend on time bound projects. Some time NGOs might have been running many projects and sometimes these organisations face project crisis. During crisis period, if NGOs have not sufficient corpus fund to sustain their potential employees, they might switchover to other organisations. CHIRAG was recruiting employees at low salary but was sustaining them even after completion of project duration. It has developed job security among CHIRAG's employees.

Work Behaviour: Data pertaining to centrality of work, centrality of family, job affect, job clarity and achievement motivation aspects of work behaviour is presented in Table 2.

Centrality of work and family: It can be observed in Table 2 that most of the employees were having high centrality of work (69.69%) and family (74.24%). Medium level of centrality of work and family was found in 19.69 and 15.15 per cent of the employees, respectively. Only 10.60 per cent employees were with low level of centrality of work and family.

Job affect and clarity: Maximum proportion of the employees showed high level of job affect (57.57 per cent) but medium level of job clarity (60.60 per cent). Percentage of employees having medium level of job affect and high level of job clarity were 40.90 and 30.30 per cent, respectively. Low level of job clarity was found with 9.09 per cent employees. Only 1.51 per cent employees were found to have low level of job affect (Table 2).

Table 2. Aspects of work behavior (n = 132)

S. No.	Aspects work behavior	No. of respondent	Percentage
1.	**Centrality of work**		
	Low	14	10.60
	Medium	26	19.69
	High	92	69.69
2.	**Centrality of family**		
	Low	14	10.60
	Medium	20	15.15
	High	98	74.24
3.	**Job Affect**		
	Low	2	1.51
	Medium	54	40.90
	High	76	57.57
4.	**Job clarity**		
	Low	12	9.09
	Medium	80	60.60
	High	40	30.30
5.	**Achievement motivation**		
	Low	2	1.51
	Medium	70	53.03
	High	60	45.45

Achievement motivation: Maximum percentage of employees (53.03) was working with medium level of achievement motivation followed by high level achievement motivation (45.45 per cent). Only 1.51 percent employees were found working with low level of achievement motivation (Table 2). In a study on Samaj Shilpi Dampatis (SSDs) of Deendayal Research Institute (DRI), an NGO working in Bundhelkhand region of central India, Manjunatha *et al.* (2011) found that all SSDs were working with high level of achievement motivation. CHIRAG was keeping its employees on same designation for longer period. Few middle-aged employees were working on same position since they joined the organisation. It might be a cause of medium level of achievement motivation. Opportunity of promotions can enhance achievement motivation. Therefore, NGOs should conduct periodic evaluation of its employees and promote them according to their achievements. This may give permanency to the organisations against ad-hocism.

Job and life satisfaction: Majority of employees were satisfied with their job (56.81 per cent) and life (57.57 per cent). Employees with quite satisfaction level in job and life were 40.90 and 27.27 per cent, respectively. Percentage of employees who were dissatisfied with their life was 14.39, whereas only 1.51 percent employees were dissatisfied with their job. Only 1.51 percent employees have reported quite dissatisfaction level in their job and life (Table 3).

Importance given to values: Rank order of importance given to values by the employees is presented in Table 4. The values at top five positions were ability utilisation, advancement (both were at first position), peace of mind, achievement and altruism (both were at third place), creativity and authority, respectively. Values like economic rewards, variety, social interaction, dependency, social relation, comforts of life and risk were placed at lower seven positions in rank order, respectively. Whereas, values like personal development, prestige, aesthetics, autonomy and physical activity were placed at sixth to tenth position, respectively. Values working conditions and life style were placed at eleventh position.

Value Expectancies: Data presented in Table 4 clearly reveals that most favorable conditions in the organisation were to satisfy altruism, peace of mind, ability utilisation, prestige and personal development values, as these values got first five positions in rank order. Values like life style, variety, working conditions, social interaction, risk and comforts of life (similar rank), social relation and economic rewards were not being satisfied up to high extent as these values were placed at lower five positions in rank order. The values physical activity and autonomy (both at sixth position), authority, achievement, creativity, advancement,

Table 3: Job and life satisfaction

S.No.	Satisfaction level	Job satisfaction		Life satisfaction	
		No. of respondents	Percentage	No. of respondents	Percentage
1.	Quite satisfied	54	40.90	36	27.27
2.	Satisfied	75	56.81	76	57.57
3.	Dissatisfied	2	1.51	19	14.39
4.	Quite dissatisfied	1	75	1	0.75

Table 4: Importance given to values and values expectancies

S.No.	Values	Importance given to values		Values expectancies	
		Weighted mean score	Rank	Weighted mean score	Rank
1.	Ability utilization	2.69	I	2.16	III
2.	Achievement	2.62	III	1.78	VIII
3.	Aesthetics	2.37	VIII	1.69	XII
4.	Altruism	2.62	III	2.36	I
5.	Authority	2.46	V	1.93	VII
6.	Autonomy	2.27	IX	1.95	VI
7.	Creativity	2.54	IV	1.77	IX
8.	Economic Rewards	2.07	XII	1.26	XVIII
9.	Life style	2.21	X	1.54	XIII
10.	Personal development	2.42	VI	1.98	V
11.	Physical activity	2.13	XI	1.95	VI
12.	Prestige	2.39	VII	2.01	IV
13.	Risk	1.68	XVIII	1.31	XVI
14.	Social interaction	2.01	XIV	1.31	XVI
15.	Social relation	1.90	XVI	1.29	XVII
16.	Variety	2.03	XIII	1.52	XIV
17.	Working condition	2.21	X	1.47	XV
18.	Peace of mind	2.68	II	2.24	II
19.	Comforts of life	1.83	XVII	1.31	XVI
20.	Dependency	2.00	XV	1.74	XI
21.	Advancement	2.69	I	1.75	X

dependency and aesthetics were ranked from 6th to 12th position, respectively.

It can be concluded that majority of the employees of the organisation were of middle age, married, from rural background working at low salary with low career and salary progression in spite of having high experience. Majority of the employees have indicated high centrality of work and family, high level of job affect but medium level of job clarity and achievement motivation. Employees of the organization had given more importance to the values such as altruism, achievement, ability utilization and peace of mind. These human values of the employees were also being satisfied while working with CHIRAG. The employees of the organisation were highly satisfied with their life and job.

REFERENCES

Bhaskar, I. and P.S. Geethakutty. 2001. Role of Non-Governmental Organizations in Rural Development: A Case Study. *Journal of Tropical Agriculture*, **39**(1): 52-54.

Bhattacherya, M. 1987. Voluntary Associations, Development and the State. *The Indian Journal of Public Administration*, **33**: 383-394.

Gangrade, K.D. 2001. *Working with Community at the Grassroots Level*. New Delhi: Radha Publications.

Manjunatha, B.L., D.U.M. Rao and J.P. Sharma. 2011. Socio-psychological Characteristics of *Samaj Shilpi Dampatis* vis-à-vis the Performance of Village Self Reliance Campaign. *Journal of Community Mobilization and Sustainable Development*, **6**(1): 1-8.

Reddy, H. N. B. 1978. Analysis of patterns and procedures in communication of farm information by village level workers and factors associated with their behaviour. Ph.D. Thesis (Unpublished). IARI, New Delhi-12.

Sinha, J.B.P.1990. *Work Culture in the Indian Context*. New Delhi: Sage Publications.

Super, D.E. and D.D. Nevill. 1986a. *The Salience Inventory: Theory, Application and Research.* Palo Alto, California: Consulting Psychologist Press.

Tiwari, R., M.C. Sharma and B.P. Singh. 2011.Training Facilities and Motivation Among Grass Root Extension Functionaries of State Department of Animal Husbandry. *Journal of Community Mobilization and Sustainable Development*, **6**(1): 14-18.

Received on January, 2014, Revised on August, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 172-175, July-December, 2014

Assessing the Training Needs of Tribal Farmers About Improved Chickpea Production Practices in M.P.

Megha Inavati, S.R.K. Singh, A.K. Pande and Rashmi Shukla
ICAR-ZPD Zone VII, Jabalpur

ABSTRACT

Chickpea has been considered as an important *rabi* pulse in Madhya Pradesh. This study was conducted for assessing training needs of tribal chickpea growers from Balaghat district of M.P. A total of 120 growers were selected randomly for collecting the responses. The study revealed that considerable percentage (45.83%) of the respondents had high and 33.33% showed medium and 20.83% showed low training needs for the chickpea production technology. Needed areas of chickpea growers for training were: improved varieties for irrigated and un-irrigated area (45.33%), preparation and selection of land (35.33%), improved varieties based on size of seeds and name seed rate, storage, name and identification of weeds and requirement of irrigation at particular stages of crop, etc. Hence, extension workers from the line departments should take care of these aspects while planning for the training programme for the tribal chickpea growers.

Keywords: Training needs, Chickpea, Tribal

INTRODUCTION

Chickpea has the average yield of 981 kg/ha in Balaghat district of Madhya Pradesh which is less than the potential yield of 1800 kg per hectare. This shows that there is a wide gap to be covered by increasing the yield potential through the use of scientific recommended technologies. Training is vital and essential to induce motivations, create confidence and include efficiency in an individual. Training is an important educational tool which can be effectively used to improve, refresh or update the farmer's knowledge. Training is also inevitable for imparting new knowledge and updating the skill of the farmers. Training is the most important function that directly contributes to the development of the human resources (Tiwari *et al*., 2011).

Training for farmers is needed to make them aware of the latest agricultural technology by improving their day to day activities of farming. The success of our agriculture production level is directly related to the speed with which we will be able to train our growers and also able to make them knowledgeable, as well as, skilled for performing their work in a better way. Identifying training needs involves establishing areas where individuals lack skills, knowledge and ability in effectively performing the operations and also identifying organizational constraints that are creating road blocks in the performance (Mirza, 2005). Therefore, a study was undertaken to study the socio-personal and economical attributes of the chickpea growers and assess their training needs for recommended production practices, relationship between farmers attributes and their training needs, so as to suggest measures for making appropriate extension strategy for effective training.

MATERIALS AND METHODS

The study used '*ex-post facto*' research design and was conducted in selected Baihar block of Balaghat district of Madhya Pradesh. A list of chickpea growing villages was prepared with the help of agriculture extension official of the block and 10 villages were selected on the basis of random sampling. Further, 12 growers from each selected village, totaling a sample of 120 respondents were considered for the study. A list of different dimension of farmers regarding chickpea production technology was prepared with the help of guidance of extension workers and scientist and SMS

of KVK and consulting the literature. In all, 25 aspects of training needs of growers about chickpea production practices was prepared. The training needs were measured on three point continuum as ''most needed, 'needed' and 'not needed' with score of 2,1 and 0, respectively. The data were collected with the help of a pre-tested structured schedule through personal interview method. The data were analyzed with the use of mean training need score and rank orders.

RESULTS AND DISCUSSION

Socio-personal and economical attributes of the chickpea growers: The data presented in Table 1 indicate the socio-personal and economical attributes of chickpea growers of the study area. The higher percentage of groweres (62.50%) were middle aged and formally educated (80.84%). The considerable proportion (43.33%) had small size of land holding, remaining had medium and large size of land holding.

Table 1: Distribution of the respondents according to their socio-personal and economic attributes (n = 120)

Attributes	Measuring unit	Categories	Frequency	Percentage
Age	In year	Young (18 to 35 year)	40	33.34
		Middle (36 to 58 year)	75	62.50
		Old (59 to 65 years)	05	04.16
Education level	no of classes pass	Illiterate	08	6.66
		Literate	15	12.50
		Up to primary	25	20.83
		Up to middle	26	21.66
		Up to high school	37	30.83
		Up to college	09	07.52
Land holding	in ha	Marginal (up to 80.1 ha)	06	5.00
		Small (1.0 to 2.00 ha)	52	43.33
		Medium (2.01to5.00 ha)	32	26.66
		Large (> 5.00 ha)	30	25.01
Material possession	Self scoring	Low (1 to 8)	27	22.51
		Medium (9 to 17)	86	71.66
		High (18 to 25)	07	5.83
Annual income	In rupees	Below poverty line (up to 24000/-)	08	6.66
		Very low (24000 to 50000/-)	32	26.66
		Low (50000 to 100000/-)	40	33.33
		Medium (100000 to 150000/-)	30	25.02
		High (150000 to 200000/-)	10	8.33
Extension participation	Score	Low (1 to 8) scores	75	62.51
		Medium (9 to 16) scores	35	29.16
		High (17 to 24) scores	10	8.33
Contact with dev. Agencies	Self scoring	Low (1 to 5)	83	69.16
		Medium (6 to 10)	30	25.01
		High (11 to 15)	07	5.83
Cosmopolitans.	Self scoring	Low (1 to 4)	92	76.67
		Medium (5 to 8)	28	15.00
		High (9 to 12)	10	8.33
Scientific orientation	Score	Low (6 to 18)	06	5.00
		Medium (19 to 32)	22	18.33
		High (33 to 42)	92	76.67
Training exposures	Score	Low (up to 1)	84	70.00
		Medium (2 to 3)	30	25.00
		High (more than 3)	06	5.00
Adoption behavior	Score	Low (7 to 26)	80	66.67
		Medium (27 to 46)	21	17.56
		High (47 to 66)	18	15.83

The majority (71.66%) had medium level of material possession. Thirty three percent had low income and others were of very low and medium level. The majority (62.51%) of respondents had low extension participation and majority of the respondents (69.16%) shown low contact with developmental agencies. The higher percentage (76.67%) of respondents showed low cosmopoliteness, whereas majority (76.67%) had shown higher scientific orientation, low training experience (70.00%), and low adoption behavior (66.67%). The findings have conformity with the results of Patel (2007) and Mishra (2008).

Chickpea production practice-wise training needs of growers: The data presented in Table 2 shows the training needs of chickpea growers. The majority of chickpea growers reported the most needed area of training were: name and identification of disease (86.66%), recommended dose of chemicals for disease control and its methods of application (85.83%), recommended dose of chemicals for weed control and its methods of application (84.16%),disease resistant varieties (83.33%), name and identification of insects (82.50%), recommended dose of chemicals for insects control and its methods of application (79.16%), integrated pest management and its methods of application (78.33%), recommended dose of fertilizers for un-irrigated land and its methods of application (75.00%), method of seed treatment by

Table 2: Training need of growers about chickpea production practices

S.No.	Package of practices	Level of Training needs			Rank
		Most needed	Needed	Least needed	
Most needed					
1.	Name and identification of disease	104	10	6	I
2.	Recommended dose of chemicals for diseases control and its method of application	103	09	08	II
3.	Recommended dose of chemicals for weed control and its method of application	101	16	03	III
4.	Name of disease resistant varieties	100	12	08	IV
5.	Name and identification of insects	99	15	06	V
Needed areas					
6.	Recommended dose of chemicals for insects control and its method of application	95	14	11	VI
7.	Integrated Pest management and its method of application	94	17	09	VII
8.	Recommended dose of fertilizers for irrigated land and its method of application	92	16	12	VIII
9.	Recommended dose of fertilizers for unirrigated land and its method of application	90	27	03	IX
10.	Method of seed treatment by culture	89	25	06	X
11.	Name and recommended dose of culture	86	20	14	XI
12.	Storage	85	30	05	XII
13.	Name and identification of weed	83	29	08	XIII
14.	Method of seed treatment with fungicides	82	25	13	XIV
15.	Name and recommended dose of fungicides for seed treatment	80	24	16	XV
Least needed					
16.	Seed rate	73	37	10	XVI
17.	Sowing method	70	28	22	XVII
18.	Plant to plant and row to row distance	68	45	07	XVIII
19.	Time of sowing	67	24	29	XIX
20.	Name and recommended doses of organic manures	65	40	15	XX
21.	Improved varieties based on size of seed	50	40	30	XXI
22.	Improved varieties of irrigated and un-irrigated land	30	55	35	XXII
23.	Preparation and selection of land	23	43	54	XXIII
24.	Requirement of irrigation at particular stage of crop	05	30	86	XXIV
25.	Harvesting	04	25	91	XXV

culture(74.16%),name and recommended dose of culture (71.66%), storage (70.83%), name and identification of weeds (69.19%), method of seed treatment with fungicides (68.33%), name and recommended dose of fungicides for seed treatment (66.66%) and seed rate (60.83%).

The data presented in the above table shows the needed area of chickpea growers for training were improved varieties for irrigated and unirrigatd area (45.33%), preparation and selection of land (35.33%), improved varieties based on size of seeds and name and recommended dose of organic manures (33.33%), plant to plant and row to row distance (32.50%), seed rate (30.83%), storage (25.00%), name and identification of weeds and requirement of irrigation at particular stages of crop (24.16%), sowing methods (23.33%), recommended dose of fertilizers for un-irrigated land and its methods of application (22.50%).

The table shows the area where the chickpea growers least require the training were harvesting (75.83%), requirement of irrigation at particular stage of crop (71.66%), preparation and selection of land (45.00%),improved varieties of irrigated and un-irrigated area (29.16%), improved varieties based on size of seeds (25.00%), time of sowing (24.16%). It is clearly evident from the data in Table 3 that 45.84% growers showed high and 33.33% showed medium level of training needs where as 20.83% showed low training needs for the chickpea production technology. Hence, extension workers from the line departments should take care of these aspects while planning for the training programme for the tribal chickpea growers.

Table 3: Distribution of the respondents according to their training needs

Category	Frequency	Percentage
Low (1-30)	25	20.83
Medium (31-60)	40	33.33
High (61-90)	55	45.84

CONCLUSION

It may be concluded that the adequate training programmes need to be organized on the most needed areas of chickpea production technology which may improve the knowledge, as well as, skill among the tribal farmers. This, in turn, could lead to the higher chickpea production in the region and would help the farmers in gaining more farm income. Hence, on the basis of this study it is recommended that state department, as well as, KVK must conduct the training need assessment exercise in the farmers' condition so that the organized programmes could match with the needs of the farming community.

REFERENCES

Bhattacharyya, D.K. 2006. Human resource planning, 1st ed. Excel books, New Delhi, pp. 226-227.

Mirza, S.S. 2005. Human resources management, Tata McGraw-Hill publication, New Delhi, 3rd ed., pp. 240-241.

Mishra, R. 2008. A study on technological gap and constraints in cultivation of chickpea in Panagar block of Jabalpur district (M.P.). *M.Sc. (Ag.) Thesis (unpublished),* JNKVV, Jabalpur.

Patel, A.K. 2007. A study on analysis of training needs of chickpea growers for plant protection measures in Naighadi block of Rewa District (M.P.). *M.Sc. (Ag.) Thesis (unpublished),* JNKVV, Jabalpur.

Rokonuzzaman, M. 2013. Training needs of tribal people regarding income generating activities *Indian Res. J. Ext. Edu*., **13**(2): 10.

Tiwari, R., M.C. Sharma and B.P. Singh. 2011. Training facilities and motivation among grassroot extension functionaries for state department of animal husbandry. *Journal of Community Mobilization and Sustainable Development,* **6**(1): 13-17.

Received on November, 2013, Revised on July, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 176-181, July-December, 2014

Associates of Adolescents' Attitude towards Reproductive Health

Ragini Mishra and Sophia Gir
Department of Human Development and Family Studies, College of Home Science, MPUAT, Udaipur, Rajasthan

ABSTRACT

The present investigation was aimed to assess Adolescents' attitude towards reproductive health. For the purpose Reproductive Health-Attitude Questionnaire (RH-AQ) was constructed and validated. Three hundred and twenty adolescents (160 boys and 160 girls), between the age range of 13- 18 years (early adolescents-13-15 years and late adolescents 15-18 years) were selected from 16 urban and rural non co-educational government schools of Udaipur District. Data was analyzed in terms of frequency, percentage and chi-square. Finding of research suggested that adolescent's were having poor knowledge regarding reproductive health in relation to their age, gender and place of residence and selected aspects of reproductive health.

Keywords: Adolescents, Reproductive health, Age, Gender

INTRODUCTION

Attitude towards reproductive health is the most sensitive influencing factor contributing wholesome personality, especially during adolescence, which is the phase full of challenges when majority of adolescents' exhibit changes in their attitude and behavior, i.e. isolation, heightened emotionality, loss of self-confidence, lower self-esteem, identity crises, due to rapid physiological changes. This is a phase, labeled as phase of negativity, as pupils become more concerned for their physical appearance, physiological changes and opinion/reactions of others towards them. During this period they often face problem of ambiguity and negativity because they isolate themselves from their family and peer and are unable to express their feelings and views due to fear of being misunderstood and mistreated. Adolescents are also less resourceful in terms of independence, accessing right information from parents, siblings and teachers. The good/bad reactions or approval/disapproval from others and knowledge, helps to shape their concept of self which results in positive or negative self-image. Ferdrickson (2001) said, adolescents displaying the positive attitude become more adjusted and happy and in contrast to this negative attitude narrows repertoire of thought and action leaves a life-long impact on the individual's happiness. Thus, the aim of this research was to assess reproductive health attitude of adolescent. It is hoped that the publication of this research will help in understanding the adolescent's attitude towards reproductive health, in rapidly changing scenario.

MATERIALS AND METHODS

To assess attitude of adolescent towards reproductive health, the study was conducted in 16 urban and rural non co-education government schools of Udaipur district. Total sample consisted of 320 adolescents (160 boys and 160 girls), between the age range of 13- 18 years (early adolescents-13-15 years and late adolescents 15-18 years). For purpose Reproductive Health Attitude Questionnaire (RH-AQ) was constructed and validated. The questionnaire consisted of aspects namely; the growing body, emergence of gender identity, socio-emotional challenges associated with reproductive health, growing wholesome boy and girl relationship, physical health promoting reproductive health. Frequency, percentage and chi square were used to analyze the data.

RESULTS AND DISCUSSION

Associates of adolescents' attitude towards reproductive health

Age: During adolescence, teenagers begin the process of developing a sexual self-concept, which involves the

combination of physical sexual maturation, age-appropriate sexual behaviors, and formation of a positive sexual identity and sense of well-being? Hurlock (2002) says when pubertal changes begin; adolescents usually withdraw from their peer and family activities and often quarrel with them. They spend much time in daydreaming about how misunderstood and mistreated they are; satisfying their curiosity with unreliable sources and are experimenting with masturbation that pubescent children find difficulty to communicate with other about their state and exhibit more negative attitude while late adolescents are adjusted to some extent to their changes. Early adolescents are also deprived in term of dependence and familial support to access information and services on sexuality in comparison to late adolescents. Thus it can be said that differences in negativity/ambiguity of attitude of early and late adolescents regarding reproductive health, is due to their age differences which justifies the results of Table.1 which defines that majority (59.38%) of early adolescent showed negative attitude towards reproductive health as compared to late adolescents (51.26%) while 32.50 per cent of early adolescents were having ambiguous attitude followed by late adolescents (37.50%). Only few early adolescents (8.12%) had positive attitude as compared to late adolescents (11.26%) and also reflects that there is a significant relationship between age differences in type of attitude of adolescents toward reproductive health. In line with above findings, Lindberg *et al.* (2000) reported prevalence of dilemma and misconceptions among teenagers for reproductive health.

The observation of data generated from Table 1 claims that majority of early adolescents had negative attitude toward selected aspects of reproductive health as compared to late adolescents. Similar to the finding of the present Ukkali and Sadashiva (2006) explains that the attitudes of adolescents change drastically due to rapid increase in physical growth and hard struggle to adjust mentally, which stabilize negativity in early adolescence regarding reproductive health while experiences helps older adolescents to understand, evaluate and stabilize themselves, which consequently leads to become logical and positive about their reproductive health. Pathan (2010) describes that in early adolescence, adolescents might become preoccupied with body changes, become interested in sexual anatomy and sex, compare changes in their body with others while late adolescents are adjusted to changes to some extent.

The development of attitude in adolescents is similar to their family and friend that surround them. Adolescents spent their most of the times either in school with friend or at home which provides a framework for knowledge and attitude development towards reproductive health issues. Eggleston *et al.* (1999) investigated sexual attitude and behaviour among adolescents. The present study revealed that sexual attitude and behaviour of adolescents have been significantly sharpened by socio-cultural norms and young adolescents need better sex education and greater access to reproductive health services to promote their wellbeing.

Education is another approach to be considered while dealing with the problems of adolescents related to reproductive health issues. A majority of parents and teachers had the opinion that knowledge on reproductive health increases sexual experimentation. This is mainly due to its being against social, moral and cultural values. Adolescents have common biological and developmental issues regarding reproductive health. Thus, there is need for bringing change in attitude of

Table 1: Association between adolescents' variables and their attitude towards reproductive health (n = 320)

Selected Variables	Adolescents	Type of attitude			Chi-square (χ^2)
		Positive	Ambiguous	Negative	
Age	Early Adolescents (n = 160)	8.12	32.50	59.38	9.66**
	Late Adolescents (n = 160)	11.26	37.50	51.26	
Gender	Boys (n = 160)	11.26	39.38	59.38	9.6**
	Girls (n = 160)	8.12	30.62	51.26	
Place of residence	Urban (n = 160)	12.50	38.12	49.37	13**
	Rural (n = 160)	6.87	31.87	61.25	

Note: figures denote percentages; **Significant at 1% level of significance

parents and teachers about reproductive health issues (Jain *et al.,* 2010) to improve adolescent's attitude as well.

Gender: Gender stereotypes, social cultural norms, poorly educated peer and conservative attitude of parents and teacher toward reproductive education of girls prohibit girls to gain information as well as impart negativity and ambiguity toward this. Boys are benefited than girls in terms of education and independence which significantly affects their attitude to have information on reproductive health issues. Data generated from table 1 reveals that majority (51.26%) girl had negative attitude toward reproductive health as compared to boys (59.38%) while (39.38%) boys reported ambiguous attitude towards the aspect followed by girls (30.62%). Only 8.12 per cent of girls and 11.25 per cent of boys fall in category of positive attitude which claims that even there was slight difference between negative attitude regarding gender differences but percentage of negativity and ambiguity regarding reproductive health was higher among girls as compared to boys.

According to Johnson (1963) and Dixon (1958) adolescence as phase is more pronounced in girls than in boys. Girls as a group tend to mature more rapidly than boys. Rapid physiological changes lead to feeling of embarrassment to these changes and further for negative attitude towards matters related to reproductive health and secured relation and conscious behavior self while in case boys impulses aroused may been stronger but they had more chance to adjust as they grow (Hassestt, 1977). Hence it is true that girls develops negative attitude during the adolescence than the boys.

Awareness plays a pivotal role to have favorable attitude towards reproductive health and behviour (Sharma, 2009). Data generated from table.1, clearly claim that majority of girls exhibited negative and ambiguous attitude toward reproductive health issues such as menstruation, masturbation, marriage, pregnancy, homosexuality, heterosexual relationships and abortion as compared to adolescent boys. Majority of girls found reproductive health matters interesting but were having ambiguous attitude to access the information while boys had some liberal attitude towards these issues. Bhan *et al.* (2004) also revealed in a study that majority of adolescents boys (76%) and girls (80%) held negative attitude towards reproductive health. McManus and Dhar (2008) in a study stated that gender disparity as critical issue contributing to poor understanding and attitude towards socio-emotional challenges among female adolescents students. Observation of table reveals prevalence of ambiguous/ negative attitude for the aspect physical health among adolescents, especially in girls, in contrast to the present results Gupta *et al.* (1999) emphasized, high awareness of method of immunization and health among girls.

In relation to this, studies were reviewed and it was found that cultural and social prohibitions, barriers (Leslie, 2002) and discrimination are imposed on girls when they enter adolescence. They learn and do what they are expected to do as being a female. Lack of correct information and parental rigidity and attitude towards reproductive health, may be one of the reasons behind carrying negativity regarding reproductive health issues. In solution to this, Mohammadi *et al.* (2007) says parent-adolescent communication should be improved through intervention programs which focus on knowledge and skills. Parents should be aware of the effects of appropriate communication with their adolescents. It should be stressed for parents to place a high value on their teen's education and to discuss family values and moral issues with them. This will help in the development of positive attitude towards life and cope with challenges associated with reproductive health.

Adolescence is an age when teenagers should have proper knowledge and positive attitude for promotion of their reproductive health wellbeing throughout the life. The parental education, attitude and involvement as well as teacher, peer and media plays very important role information of positive or negative attitude regarding reproductive health thus promotion of awareness among them is the need of time for betterment of adolescent's reproductive health. Sharma (2009) documented that since adolescence is a period of rapid personal, physical and intellectual development and the effects of poverty, illiteracy as well as lack of nutritional and health care are further magnified by gender discrimination, girls of this age group need to be addressed as special target category by development programmes.

Place of residence: Research has been somewhat consistent in reporting a relationship between location (rural or urban) attitude. Effects of urban versus rural environment on pubertal changes have lately been an issue of greater concern to researchers interested in

studying adolescent developmental stages (Moore *et al.*, 1990 and Ray *et al.*, 2012). Data generated from table. 1 clearly projects that majority (61.25%) of rural adolescents had negative attitude toward reproductive health as compared to urban adolescents (49.37%) while 38.12 per cent of urban adolescents and 31.87 per cent of rural adolescents reported ambiguous attitude towards the aspect. A small percentage of rural adolescents (6.87%) and urban adolescents (12.50%) were found with positive attitude. This figure claims that still there lack awareness regarding reproductive health issues among rural adolescents. The reason behind this can be low level of education, cultural barriers, prohibition to discuss reproduction and sex, and lack of support systems/ services for adolescents regarding reproductive health in rural area while plenty of sources and opportunities are available to urban adolescents in terms of media and technological advancement.

Moore *et al.* (1990) emphasized on results similar to present study. Further he stated that rural students often lack basic reproductive health information, knowledge, and access to affordable confidential health services for reproductive health. Many do not feel comfortable in discussing reproductive health with parents. Likewise, parents, health care workers, and educators frequently are unwilling or unable to provide complete, accurate, age-appropriate reproductive health information. This is often due to their discomfort about the subject or the false belief that providing the information will encourage sexual activity in rural area, while in case of urban area situation is better. Reproductive health is a taboo even for urban area but urban adolescents are resourceful in terms of education, technology, health services, opportunities, and facilities. This may be the contributing reason behind differences in attitude of rural and urban adolescents.

Adolescents' attitude towards selected aspects of reproductive health: Adolescence is age when teenagers should have proper knowledge and positive attitude regarding reproductive health issues for promotion of their wellbeing throughout the life but in the results of the present study, majority of subjects were found with negative and ambiguous attitude towards all selected aspects of reproductive health. During investigation it was found that Ambiguity and negativity was prevalent among adolescents for gender identity (62.18%), and growing body (56.25%). Majority of adolescents were having misconception, poor confidence with regards to their physical appearance and were concerned for social and cultural approval for it. Adolescents found these changes quite interesting but were not in favor of accessing information. Wellings *et al.*, (2006) emphasized that psychological and emotional readiness for changes associated with positive and negative attitude towards growing body and physical appearance.

Rapid physical changes during adolescence increases interest of adolescents in sexuality and formation of attitude towards reproductive health depends upon factors involved in socialization of adolescent, including peers, teachers and parents. Study revealed adolescents found masturbation, pregnancy, abortion, family planning methods, STDs and homosexuality as interesting topics, but perceived them as secret topics of adults. Majority of adolescents considered advertisements of family planning methods as reason of increasing sex experimentation. Kind of attitude and understanding of issues inhabited adolescents' to access the information because of which majority of subjects (62.18%), scored negative attitude for the aspect socio-emotional challenges associated with reproductive health. Awareness plays a pivotal role in motivating to have favorable attitude towards the aspects but poor knowledge and stigmatizing attitude was observed by Pramanik *et al.* (2000). Another study by Ganguli *et al.* (2002) was performed in colleges of Nasik, Maharashtra. They observed that adolescents had good knowledge but negative attitude towards HIV-AIDS patients and were not sympathetic. Similar degrees of misconception have been reported by Garg *et al*. (2005).

The present study reveals that majority of adolescents (60.00%) viewed heterosexual relationship as status symbol which is an indicator of poor understanding of healthy heterosexual relationships. Adolescents also believed in hiding their relationship with others except their friends. Physical health and vaccination play a very important role in promotion of reproductive health but majority (55.60%) reported, unhealthy eating patterns and vaccinations had no implication on reproductive health. Above observation helps to conclude that majority of adolescent boys and girls were having stereotype attitude towards the aspects of reproductive health. Adolescents consciously or

subconsciously follow or adapt themselves to the behavior and attitudes the parent has established within the home. Parents become role models – their behaviors and attitudes providing examples of how to behave in relation to many areas of daily life. Galinsky (1980); Steinberg and Darling (1994); and Steinberg, (2001) also observed a very strong influence of parents peer, school and media on attitude of adolescents while Kilbourne, (1998) reported that attitude concerning reproductive health can be attributed to social and cultural barriers.

Lansdown (2011) said that adolescents have a unique body of knowledge about their lives, needs and concerns, together with ideas and views which derive from their direct experience but they do not have access to sufficient and correct information of RH issues. Their poor knowledge, ambiguity/negativity, cultural, social and familial restrictions inhabit them to gain knowledge. Thus, promotion of development positive attitude through improving parent-child communication, teachers' involvement in imparting reproductive health education is solution to improve adolescent's reproductive health attitude.

Pathan (2010) documented that from childhood as the child keeps on growing right up to adolescent stage and takes proper shape after the adolescent stage several factors are responsible for such changes, which are physical, emotional, psychological and sociological. Adolescents may have negative or positive traits depending upon his environment, his upbringing, love and affection received from parents and siblings, and the atmosphere at school level. From infancy, adolescents consciously or subconsciously follow or adapt themselves to the behaviour and attitudes the parent has established within the home. School is a critical building block for the development of positive attitude and healthy behaviors during adolescence (Lloyd, 2007) by imparting education. Several studies has proven that parents and teacher from rural area hardly contribute in imparting correct knowledge among adolescents due to cultural and social taboos they received from their elders. Thus, based on the investigation of Ugoji (2013), it was recommended that parents and older adults in the society should equally be educated to enable them uphold their responsibilities towards their adolescents' sexual development. Orientation and induction programmes should be provided to develop positive attitude towards appropriate sexual behaviour as well as the acquisition of relevant and adequate valid and usable knowledge of reproductive health.

CONCLUSION

The development of positive attitude towards reproductive health program needs urgent attention for improvising adolescents' attitude to ensure their health and wellbeing.

REFERENCES

Bhan, B.N., P. Mahajan and M. Sondhi. 2004. Awareness regarding sex knowledge among adolescent girls. *Anthropologist,* **6**(2): 101-103.

Dixon, M.M. 1958. Adolescent girls tell about themselves. *Marriage and Family Living,* **20**: 400-401.

Eagly, A.H. and S. Chaiken. 1993. The psychology of attitudes. *Fort Worth, FL: Harcourt Brace & Company.*

Fredrickson, L.B. 2001. The role of positive emotions in positive psychology. *Am Psychol. Mar.,* **56**(3): 218–226.

Galinsky E. 1980. The six stages of parenthood. Reading, Addison-Wesley, Newberger CM. The Cognitive Structure of Parenthood: Designing a Descriptive Measure. *New Directions for Child Development,* **7**: 45–67.

Ganguli, S.K., P., Pege, N. Gupte and A. Charan. 2002. AIDS awareness among undergraduate students, Maharashtra. *Indian Journal of Public Health,* **46**(1): 8-12

Garg, N., S.P. Singh and R.N. Mishra. 2005. Knowledge of first year graduate students about HIV/AIDS and its socio-demographic correlates in Varanasi. *Indian Journal of Preventive and Social Medicine,* **36**(3&4): 132-136.

Gupta, S.S., M.M. Singh and R. Devi. 1999: Awareness and health seeking behaviour of rural adolescent school girls on menstrual and reproductive health problems. *Indian Journal of Medicine Science,* **53:** 439-443.

Hassestt, J. 1977. A new look to living together. *Psychology*, **11**(7): 82-83.

Hurlock, E. 2002. Developmental psychology: *A Life-Span Approach (fifth edition),* New Delhi: Tata McGraw-Hill Publishing Company Ltd. Pp. 196-295.

Jain, N., S.D. Gupta and L.P. Singh. 2010. Meeting reproductive and sexual health needs of adolescents: A strategic approach for Rajasthan, IIHMR Working Paper No. 4.

Johnson, J. and J. Brook. 1963. *The psychology of Adolescence.* 3rd Ed. Collier MacMillan International ed. p. 34

Kilbourne, M. 1998. Adolescent reproductive health: making a difference. *Outlook,* **16**: 1-8.

Lansdown, G. 2011. Every child's right to be heard. Published by Save the Children. *UK on behalf of Save the Children and UNICEF.*

Leslie, E. 2002. Youth sexuality: action research from Burkina Faso and Senegal Los Angeles: *Pacific Institute for Women's Health. USAID.*

Lindberg, I.D., L. Ku and F. Somenstein. 2000. Adolescents' reports of reproductive health, education. *Family Planning Perspective,* **32**: 220-226.

Lloyd, C.B. 2007. Poverty, gender, and youth : the role of schools in promoting sexual and reproductive health among adolescents in developing countries, working paper No. 6, population council. One Dag Hammarskjold Plaza New York, New York 10017, USA.

McManus, A. and L. Dhar. 2008. Study of knowledge, perception and attitude of adolescent girls towards STIs/ HIV, safer sex and sex education: (A cross sectional survey of urban adolescent school girls in South Delhi, India). *BMC Women's Health,* **8**: 12.

Mohammadi, M.R., S. Alikhani, K. Farideh and F. Abadi. 2007. Parents' attitudes towards adolescent boy's reproductive health needs and practice in Tehran. Iran. *Journal of Psychiatry,* **2**: 13-24.

Moore, E.J., E.L. Baum and R.B. Glasgow. 1990. Economic factors influencing educational attainment and aspirations of farm youth. Washington, DC: Economic Research Service, Resource Development Division. (ERIC Document *Reproduction Service Document No.* ED 015797).

Nain, M.S. and P. Kumar. 2010. A study of women participation and decision making in farm management. *Journal of Community Mobilization and Sustainable Development,* **5**(1): 67-71.

Pathan, S.S. 2010. Adolescent's attitude towards self. *Journal of Arts Science and Commerce,* **1**: 119-125.

Pramanik. 2000. *HIV/AIDS Stigma and Knowledge among Predominantly Middle-Class High School Students in New Delhi,* India http://74.125.155.132/scholar?q=cache:rDn4hZqpUcEJ:scholar.google.com/&hl=en&as_sdt=2000&;as_vis=1

Ray, S., T. Ghosh and S. Bisai. 2011. Knowledge and information on psychological, physiological and gynecological problems among adolescent schoolgirls of Eastern India. *Ethiopian Journal of Health Sciences,* **21**(3): 183-189.

Sharma, S. 2009. A study on the association between self-esteem and stress in adolescents, *Ph.D. Dissertation, Department of Family studies, college of Home Science,* MPUAT, Udaipur, Rajasthan.

Steinberg, L. 2001. We know some things: Parent-adolescent relationships in retrospect and prospect. *Journal of Research on Adolescence,* **11**(1): 1-19.

Steinberg, L. and N. Darling. 1994. The Broader Context of Social Influence in Adolescence. In: Silbereisen, R.K., Todt, E., eds. *Adolescence in Context: The Interplay of Family, School, Peers, and Work in Adjustment,* New York, Springer-erlag, pp. 25–45.

Tripathi, V. 2005. *Peer power: Pre-adolescents culture and identity.* New Branswick, N.J., Rutger, University Press.

Ugoji, F.N. 2013. An Examination of University Students' Attitude to Contraceptive Use. *American International Journal of Social Science*, **2**(1): 18-22.

Ukkali, V. and B. Sadashiva. 2006. Comparative study of attitudes of adolescents, studying in junior colleges of rural and urban areas of Tumkur towards social, educational and nutritional aspects of life. http://hdl.handle.net/123456789/1661

Wellings, K. 2006. Sexual behaviour in context: a global perspective, *Lancet,* **368**(9548): 1706–1728.

Received on July, 2013, Revised on June, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 182-185, July-December, 2014

Impact of KVK Entrepreneurship Training on Knowledge of Trainees

Ashok Kumar Gautam, R.K. Dohrey, Basavaprabhu Jirli, Arun Kumar and Dheeraj Mishra
Department of Extension Education N.D.U.A.T. Kumarganj, Faizabad, Uttar Pradesh

ABSTRACT

The study was conducted in Haidergarh block of Barabanki district to study the impact of trainings provided by KVK. 50 trained respondents were selected randomly from KVK and 50 untrained respondents were selected randomly from one uncovered village keeping in view of similar attributes. The data revealed that majority of both the trained and untrained respondents belonged to small farmer category. Majority of both the trained respondents (52%) and untrained respondents (44%) reported to annual family income category of Rs. 50001 to 100000. The majority of trained respondents (64%) were found under medium category of knowledge level, while in case of untrained respondents, majority (52%) were found in low category. Impact of KVK training on knowledge extent of trainees was significant as against untrained respondents.

Keywords: Impact of training, Extent of contact, Z' test, Knowledge extent

INTRODUCTION

In India, the ruralites are mostly dependent on agriculture for their livelihood. The agro and non-agro enterprises are adopted by them on a very negligible scale. Besides agriculture, the agro and non-agro enterprises, if established on farms and homes of rural families, will do better in improving the socio-economic profile of the plebs and weaker section of rural society. Being inspired with this basic idea, the government and non-governmental organizations are actively involved nowadays, to establish the enterprising network as the sources of income and employment-generation, so as be more and more economically and socially sound. Krishi Vigyan Kendras (KVKs) provide vocational training to rural youths, school dropouts, farmers and farm women to undertake the income and employment generating activities at their door and farms. Courses are based on the information received through family and village survey. No specific qualification is required to participate in the training programmes. No certificate is awarded after training programmes. After conducting the training programmes, follow up programmes are organised for converting the obtained knowledge & skills of the trainees (Lal & Tandon, 2011).

Vocational trainings like dairy production, poultry production, mushroom production, bee keeping, seed production, goat rearing *etc.* are provided by KVKs. Mushroom production enterprise was selected for this study as this enterprise is considered more beneficial to the rural farmers.

MATERIALS AND METHODS

The study was conducted in Haidergarh block of Barabanki district. The locale for the study was selected purposively as the district KVK has been conducting trainings for mushroom production on a large scale in the region. 50 trained respondents were selected randomly from the list of trainees who participated or registered in trainings which were provided by KVK and 50 untrained respondents were selected randomly from one uncovered village (Gotauna) keeping in view of similar attributes. The analysis of data was done with dependent variable knowledge gain of respondents regarding mushroom enterprise technology.

$$\text{Knowledge gain} = \frac{\text{No. of scores obtained}}{\text{Total No. of possible scores}} \times 100$$

The percentage, mean, standard deviation and 'Z' test were used for analysis and drawing the inferences.

RESULTS AND DISCUSSION

Socio-economic condition: The data revealed that majority of the trained respondents (58.0%) and untrained (52.0%) belonged to small farmer category (1 to 2 ha. land) followed by marginal farmer category (below 1 ha land) which was 26.0% trained respondents and 38.0% untrained respondents. Majority of both the trained respondents (52.0%) and untrained respondents (44.0%) had annual family income Rs. 50001 to Rs. 100000 followed by trained respondents (24.0%) and untrained respondents (30.0%) had Rs. 100001 to Rs. 150000. Majority of the trained respondents (96.0%) had radio followed by mobile (66.0%), T.V. (58.0%), newspaper (34.0%), VCD/DVD (28.0%), agricultural books (8.0%), general magazines (6%) and telephone (4.0%) respectively. Similar was in case of untrained respondents, except percentages.

Extent of contact with information source:

Extent of contact with information source	Trained respondents (Mean score value)	Untrained respondents (Mean score value)
Formal Sources		
gram pradhan	0.56 (I)	0.63 (I)
KVK	0.52 (II)	0.01 (III)
Co-operative societies	0.50 (III)	0.52 (II)
Informal Sources		
family members	1 (I)	0.99 (I)
Neighbors	0.79 (II)	0.79 (II)
Mass media Exposure		
Radio	0.99 (I)	0.97 (I)
T.V.	0.90 (II)	0.86 (II)

Data revealed that the maximum contact was found with gram pradhan (0.56 trained & 0.63 untrained) followed by KVK (0.52 trained) and Co-operative societies (0.52 untrained) among formal sources, in informal sources maximum contact was found with family members (1 trained & 0.99 untrained) followed by Neighbors (0.79 trained & 0.79 untrained). In mass media exposure maximum information was received from radio (0.99 trained & 0.97 untrained) followed by T.V. (0.90 trained & 0.86 untrained) in information sources.

Socio-economic condition	Trained Respondents (%)	Untrained Respondents (%)
Land Holding		
Small farmer category (1 to 2 ha land)	58.0 (I)	52.0 (I)
Marginal farmer category (below 1 ha land)	26.0 (II)	38.0 (II)
Annual Income		
Annual family income Rs. 50001 to Rs. 100000	52.0 (I)	44.0 (I)
Annual Family Income Rs. 100001 to Rs. 150000	24.0 (II)	30.0 (II)
Material Possession		
Radio	96.0 (I)	88.0 (I)
Mobile	66.0 (II)	72.0 (II)
T.V.	58.0 (III)	62.0 (III)
Newspaper	34.0 (IV)	36.0 (V)
Vcd/Dvd	28.0 (V)	44.0 (IV)
Agricultural Books	8.0 (VI)	4.0 (VIII)
General Magazines	6.0 (VII)	14.0 (VI)
Telephone	4.0 (VIII)	6.0 (VII)

Table 1: Distribution of respondents according to level of knowledge about mushroom enterprise technology (n=100)

Score categories	Trained (n=50)		Untrained (n=50)	
	f	%	*f*	%
Low (up to 28)	0	0.00	26	52.00
Medium (29 to 75)	32	64.00	24	48.00
High (76 and above)	18	36.00	0	0.00
Total	**50**	**100.00**	**50**	**100.00**

Extent of knowledge: Table 1 indicates that the majority of the trained respondents (64.0%) possessed medium level of knowledge followed by high (36.0%). Likewise, in case of untrained respondents, 52.0 per cent possessed low level of knowledge followed by medium level of knowledge (48.0%). The mean score was found to be 52.0 per cent. This finding is in confirmation with the works of David & Kumar (2002), Dubey & Srivastava (2005) and Borate *et al.* (2011).

The data furnished in Table 2 shows that the practices like edible mushroom, spawning rate, spawning time and growing time ranked first followed by compost pit/bag making and yield which was ranked IInd, casing time & harvesting both ranked IIIrd, loan ranked IVth,

Table 2: Practice wise extent of knowledge about mushroom enterprise technology (n = 100)

Practices	Trained (n = 50)		Untrained (n = 50)	
	Extent of knowledge (%)	Rank order	Extent of knowledge (%)	Rank order
Loan	95.0	IV	65.5	III
Edible mushroom	99.0	I(A)	59.0	IV
Spawn making/purchasing	68.0	IX(A)	38.5	VI(A)
Compost pit/bundle/bag making	97.0	II(A)	31.83	IX
Spawning rate	99.0	I(B)	33.0	VIII
Spawning time	99.0	I(C)	35.5	VII
Growing time	99.0	I(D)	28.5	XI
Growing temperature	68.0	IX(B)	23.5	XII
Casing	91.2	VI	3.2	XV
Casing time	96.0	III(A)	12.0	XIV
Disease/pest control	59.26	X	16.84	XIII
Harvesting	96.0	III(B)	30.5	X
Yield	97.0	II(B)	38.5	VI(B)
Mushroom products	79.73	VIII	49.43	V
Storage	93.0	V	68.0	II
Marketing channel	82.0	VII	74.0	I
Overall average	**83.78**		**34.14**	

storage ranked Vth, casing ranked VIth, marketing channel ranked VIIth, mushroom products ranked VIIIth, spawn making/purchasing & growing temperature both ranked IXth and disease/pest control ranked Xth in extent of knowledge. The overall average of knowledge extent was found to be 83.78 per cent.

Likewise, in case of untrained respondents, the extent of knowledge in marketing channel was ranked Ist, storage ranked IInd, loan ranked IIIrd, edible mushroom ranked IVth, mushroom products ranked Vth, spawn making/ purchasing &yield ranked VIth, spawning time ranked VIIth, spawning rate ranked VIIIth, compost pit/bag making ranked IXth, harvesting ranked Xth, growing time XIth, growing temperature ranked XIIth, disease/pest control ranked XIIIth, casing time ranked XIVth and casing ranked XVth respectively. The overall average of knowledge extent of untrained respondents was found to be 34.14 percent. There was some Knowledge found in untrained respondents about mushroom production because most of the untrained farmers belonged to small farmer category (1 to 2 ha. land) and also they had many information sources.

Impact of training on knowledge: Table 3 depicts that with regard to the practices of mushroom production technology viz., getting loan, edible mushroom cultivation, spawn making/purchasing, compost pit/bag making, spawning rate, spawning time, growing time, growing temperature, soil making, casing time, disease/pest control, harvesting, yield, mushroom products, storage and marketing channel, the Z' cal. value is greater than 'Z' tab. value. Hence the H_0 (null hypothesis) was rejected at 5% probability level of significance. That means the training had significant effect on knowledge gain among the trainees. This finding is in confirmation with the works of Lal *et al.* (2004), Khan *et al*. (2005), Dubey & Srivastava (2005), Singh & Singh (2006) and Tiwari *et al.* (2011).

The overall extent of knowledge of trained respondents ($\bar{X}$ = 73.72) and untrained respondents (Y^{-} = 30.04) about mushroom production practices reflects that trained respondents were more knowledge able than untrained respondents.

CONCLUSION

This study concluded that majority of the trained respondents (64.0%) were observed in the medium category of knowledge level about mushroom enterprise technology while majority of untrained respondents (52.0%) were observed in the low category of knowledge level about mushroom enterprise technology. This study brings out that knowledge level of trained respondents was more than the knowledge level of untrained respondents. Hence the training had significant effect on knowledge among the trainees.

Table 3: Impact of training on knowledge of respondents about mushroom enterprise technology (n = 100)

Practices	Trained (n = 50)		Untrained (n = 50)		Z cal. value
	$\bar{X}$	S.D.	$\bar{Y}$	S.D.	
Getting loan	3.80	0.40	2.6	0.53	12.66*
Edible mushroom cultivation	3.96	0.20	2.36	1.32	8.47*
Spawn making/purchasing	2.72	0.50	1.54	0.65	10.25*
Compost pit/bundle/bag making	11.64	0.96	3.82	2.96	17.76*
Spawning rate	3.96	0.20	1.32	1.48	12.53*
Spawning time	3.96	0.20	1.42	1.07	16.49*
Growing time	3.96	0.20	1.14	1.28	15.42*
Growing temperature	2.72	1.20	0.94	0.96	8.22*
Casing (soil making)	4.56	0.54	0.16	0.79	32.45*
Casing time	1.92	0.27	0.24	0.56	19.18*
Disease/pest control	11.26	2.91	3.20	2.66	14.46*
Harvesting	3.84	0.37	1.22	1.37	13.01*
Yield	3.88	0.33	1.54	1.37	11.72*
Mushroom products	5.58	0.99	3.46	1.88	7.07*
Storage	1.86	0.35	1.36	0.66	4.72*
Marketing channel	4.10	0.30	3.70	1.16	2.35*
Overall average	73.72	4.84	30.04	14.34	20.41*

*P < 0.05, **P < 0.01

REFERENCES

Borate, H.V., R.P. Mahadik, S.G. Mahadik, A.V. Mane, A.D. Hake and K.V. Malashe. 2011. Knowledge Level of the Farmers Trained by DBSKKV, Dapoli-An Action Research. *Journal of Community Mobilization and Sustainable Development*, **6**(2): 205-208.

David, B. and A. Kumar. 2002. Knowledge assessment of practicing farmer in composite fish farming. *Bioved Research Journal*, **13**(1&2): 125-127.

Dubey, A.K. and J.P. Srivastava. 2005. Impact of KVK training programme on knowledge and adoption of brinjal crop technologies in Allahabad District. *Impact Assessment Studies, Agricultural Extension and Rural Development Programme, ISEE:* pp. 450.

Khan, I.M. A.S. Sheikh and M. Khan. 2005. Impact of KVKs in changing the knowledge, attitude and socio-economic status of the farmers. *Impact Assessment Studies, Agricultural Extension and Rural Development Programme, ISEE:* pp. 322.

Lal, B. and V. Tandon. 2011. Impact of vocational training programmes on knowledge gain by the rural youths. *Journal of Community Mobilization and Sustainable Development*, **6**(2): 174-176.

Lal, B. J.P.S. Chauhan and B.C. Das. 2004. Impact of K.V.K. Training on Improved Dairy Farming Practices in Changing Knowledge and Attitude. *Journal Interacasemicia, Nadia,* **9**(4): 597-599.

Singh, R. and M. Singh. 2006. Effectiveness of dairy entrepreneurial development training programme on the attitude and skill of dairy entrepreneurs. *Agricultural Extension Review*; **13**(3&4): 25-28.

Tiwari, R., M.C. Sharma, B.P. Singh and T. Dutt. 2011. Impact of Trainings on the Gain in Knowledge of the Field Veterinary Professionals. *Journal of Community Mobilization and Sustainable Development*, **6**(2): 112-116.

Received on September, 2013, Revised on June, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 186-191, July-December, 2014

Resources and Use Pattern of Bio-fuels by Rural Women of Bikaner District in Rajasthan

Preeti Mamgai and J.P. Singh
Zonal Project directorate, Zone-I, PAU Ludhiana, Punjab

ABSTRACT

Forest and agricultural products play a major role in the permanently settled substitute forms of agriculture practiced by the people in arid region. The population of Western Rajasthan still depends on natural shrubs/ trees for fuel-wood. The present study was conducted in the purposively selected six villages of Bikaner to study the sources and problems of fuel wood supply, utilization pattern of fuel-wood along with other fuels for cooking purposes and to find the problems faced by women regarding collection and use of bio-fuels. The data was collected from 210 respondents comprising 70 respondents from each i.e. rain fed, canal and tube well irrigated area. three percent and 19 percent of the households were using clean fuels like kerosene or L.P.G for cooking purposes in tubewell irrigated areas. *Phog* (*Calligonum polygonoides*) was one of the best quality fuel wood in the arid region. On an average the rural women and children were travelling every week at least 3-6 km per trip and devoting 4-6 hours for collection of fuel wood for cooking purposes. A total of 7 kg of fuel wood, one kg of dung cakes and 2.08 hours are required per day per meal by the cook for preparing meal for large (15-20) family. Headache (68%) and burning sensation (75%) in eyes were the major problems faced by the all the respondents while using poor quality fuel wood. The results of the study suggest that due to non-availability of cleaner fuels women are forced to go for inferior quality of fuel leading to health problems. As such women should be made aware of good ventilation and smokeless chullahs, which will substantially reduce their workload, the level of pollution and improve their health.

Keywords: Biomass, Arid, *Phog*, Fuelwood, Clean fuel

INTRODUCTION

Women play a pertinent role not only in household activities but also take part in agricultural and livestock activities. Besides this the whole responsibility of collection of fuel wood from marginal and wastelands and fetching drinking water from distant places also lies with the women. Since women are fully involved and responsible for the collection and management of domestic fuel, shortage of fuel-wood have resulted in an increase pressure on women in the villages as well as the time needed to perform daily tasks in the household. However, over exploitation of natural vegetation and acute shortage of domestic fuel resulted in villagers having to resort to unsustainable and inefficient management of available natural resources. Keeping this in view a study was carried to investigate the role of women in collection of fuel wood from different sources and consumption pattern of bio-fuels by the rural families of Bikaner district of Rajasthan with the following objectives: to study the sources and problems of fuel wood supply, consumption pattern of fuel wood along with other fuels for cooking purposes and to find the problems faced by women regarding collection and use of biofuels.

MATERIALS AND METHODS

The present study was conducted in the villages around the periphery of Bikaner district. Multi-stage random sampling technique was used to select the study local and sample universe in first stage. The first stage of selection was of Tehsils followed by villages and final stage was selection of sample families which was done purposively. Bikaner Tehsil was selected for the present study. The villages (Noorsar, Lakusar (Rainfed), Jalalsar, Jamsar Canal irrigated) & Gadwala, Napasar (tubewell irrigated) areas. The data collection was carried out

through interview schedule and personal observation method. The data were collected from 210 respondents comprising 70 respondents from each i.e. rain fed, canal and tube well irrigated area. The measurement of fuel wood that was used for cooking one time meal/family was done through measuring scale. Non availability of quality fuel wood was closely related to the extra time consumption in cooking and presence of health problems of women.

RESULTS AND DISCUSSION

Family Size & chullah: Most of the respondents were having family size between (11-15) members living in the joint families i.e. 24 respondents i.e. 34.3 percent in tube well irrigated, 21 respondents i.e. 30.0 percent in canal irrigated (Jalalsar & Jamsar) and 20 respondent's i.e. 28.6 percent in rainfed areas (Noorsar& Lakusar). Overall people still preferred to live in joint families. Fig. 1 depicts percentage of respondents using different types of *chullah* for cooking their meals in the kitchen. All the respondents' families were using simple *chullah* for cooking food in the selected areas of the study. The use of kerosene stove (32.9%) and LPG (18.6%) was highest in Gadwala & Napasar) tube well irrigated areas as the respondents having better economic well being than other selected areas. However, improved chullah (smokeless chullah) was not in use in the villages. The main sources of fuel supply were from wastelands

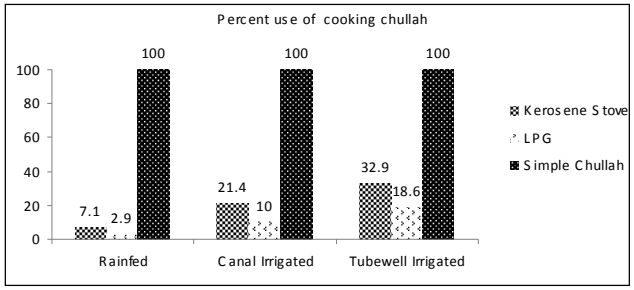

Fig. 1: Percentage of respondents using different types of *chullah*

(100%) and dung cakes (100%). Further the sources of biofuels supply were nearby forest areas, homestead areas and crop residues particularly in (Jalalsar & Jamsar) canal irrigated (28.6%) and (Gadwala & Napasar) tube well irrigated (21.4%) areas. Only few of the households were using clean fuels like kerosene oil or liquid petroleum gas for cooking purposes, whereas majority were using fuel combination i.e. biomass and clean fuel, where combination of clean fuels and biofuels were used, kerosene and LPG was mainly used for lighting and cooking snacks or very small meals. The kerosene supplied was through public distribution system (PDS) and was mostly restricted to a quota of 3l per household which was quite insufficient for the family to switch over to clean fuels for cooking purposes (Table 2).

Table 1: Family size of selected areas (n = 210)

Area	No. of Family Members			
	1-5	6-10	11-15	15-20
Rainfed	14 (20.0)	18(25.7)	20(28.6)	18(25.7)
Canal Irrigated	16(22.9)	16(22.9)	21(30.0)	17(24.3)
Tube well Irrigated	13(18.6)	18(25.7)	24(34.3)	15(21.4)

Table 2: Sources of fuel supply

Area	Fuel Sources						
	Crop residue	Waste lands	Nearby forest areas	Home-stead areas	Dung-cakes	Kerosene oil	LPG
Rainfed	-	70(100)	25(35.7)	15(21.4)	70(100)	5(7.1)	2(2.9)
Canal Irrigated	20(28.6)	70(100)	35(50.0)	14(20.0)	70(100)	15(21.4)	7(10.0)
Tube well Irrigated	15(21.4)	70(100)	40(57.1)	16(22.9)	70(100)	23(32.9)	13(18.6)

Figures in parentheses indicate percentages

Local shrubs/trees were the main source of fuel wood supply (Table 3). In rainfed areas (Noorsar& Lakusar*) phog* (*Calligonum polygonoides*) was one of the quality fuel woods in the area and it is still much preferred by the inhabitants even today as it burns easily with less smoke. Presently, the population of *Phog* has decreased sharply due to it's over exploitation. Due to non-availability of quality fuel wood, the inhabitants were forced to use inferior quality of fuel wood of other species, which were hazardous. The species like Sinia (*C.burhia*) and Bui (*A. pseudotomentosa*) are commonly used for initial lighting the fuel wood. The species like Kheep (*L. pyrotechnica*) and Aak (*Calotropis procera*) were not safe for cooking purpose because they generate large smoke and cause health problems to the women cooking in the kitchen. Suresh (2011) found that cooking on chulhas or cheap kerosene stoves which consume too much fuel and emit hazardous smoke affect women and children in particular.

Table 3: Important fuel wood species and their ranking as per respondents

Local name	Botanical name	Degree of importance
Phog	*Calligonum polygonoides*	Very good
Khejri	*Prosopis cineraria*	Very good
Rohida	*Tecomella undulata*	Good
Bordi	*Ziziphus nummularia*	Good
Bawli	*Acacia jacquemontii*	Good
Sinia	*Crotalaria burhia*	Good
Kair	*Capparis decidua*	Poor
Kikar	*Prosopis juliflora*	Poor
Kheep	*Leptadenia pyrotechnica*	Poor
Aak	*Calotropis procera*	Poor
Bui	*Aerva pseudotomentosa*	Poor

Data in the Table 4 depicts that 71 per cent households in the areas selected for the study viewed that clean fuels were very expensive whereas 56.3 per cent responded that it was not easily available. This shows that in the rural areas of Bikaner district there was shortage in supply of clean fuels.

Fuel wood collection, consumption & cooking hours: The study showed that most of the selected respondents were collecting fuel wood weekly i.e. rainfed (71.4%), canal irrigated (60%) and Tubewell irrigated areas (57%) followed by fortnightly collection

Table 4: Reasons for not using clean fuels (%)

Reasons	Rain-fed	Tube well irrig-ated	Canal irrig-ated	Average
Not Always available	58	54	57	56.3
Expensive	75	68	70	71
Scared of using	25	19	14	19.3
Taste of food changes	11	13	9	11
Wood repels for insects	8	7	9	8
Wood smoke increases longevity of thatched roof	14	4	7	8.3

of fuel wood i.e. (14.3%) rainfed (22.9%) canal irrigated and (18.6%) in tube well irrigated areas by the respondent families. Fuel wood was collected from village, government forests, wastelands etc. (Table 5).

Table 5: Frequency of fuel collection (%) (n = 210)

Area	Daily	Weekly	Fort-nightly	Monthly
Rainfed	10(14.3)	50(71.4)	10(14.3)	0.0
Canal Irrigated	4(5.7)	42(60.0)	16(22.9)	8(11.4)
Tube well Irrigated	2(2.9)	40(57.1)	13(18.6)	15(21.4)

The distance covered by the respondents for fuel wood collection per trip was also studied (Fig. 2). Majority of the respondents covered (3-6 km) distance per trip irrespective of the selected areas for the study. Maximum distance covered by the respondents of (Gadwala & Napasar) tube well irrigated areas i.e. more than 6 km/trip for collection of fuel wood for cooking purposes.

Fig. 3 depicts that most of the respondents were devoting (4-6 hrs)/trip for collection of fuel wood i.e.

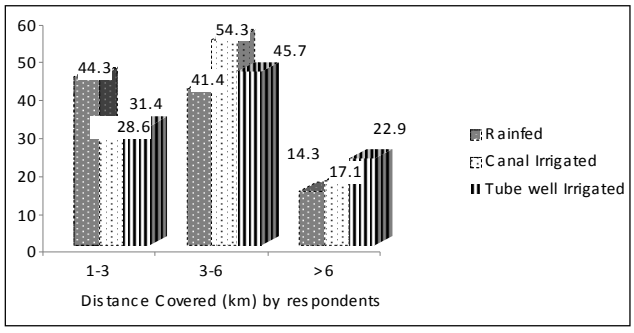

Fig. 2: Distance covered by respondents for fuel wood collection (%)

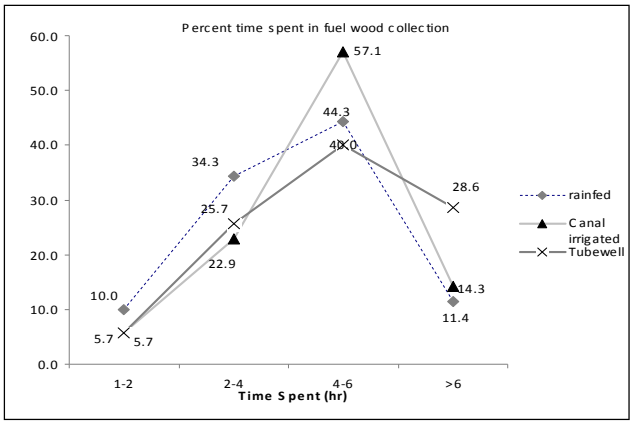

Fig. 3: Time devoted by the respondents for fuel wood collection

(44.3%) in rainfed area(Noorsar & Lakusar), (57.1%) in (Jalalsar & Jamsar) canal irrigated and (40%) in (Gadwala & Napasar) tube well irrigated areas. But in tube well-irrigated areas (28.6%) the respondents were spending more than 6 hrs per trip for collection of fuel wood. Suresh (2011) also studied that females on an average spend more than seven times as many hours in wood and water collection as males.

Cooking Practices: The number of meals cooked determines the total exposure the cook has on her health. Majority of the households cooked two meals a day (74 per cent) and 10 per cent of the households cooked once only during the day.

Table 6: Number of times meals cooked in the selected areas (%)

Area	Once	Twice	Thrice
Rainfed	6 (9)	53(75)	10(14)
Canal Irrigated	8(11)	52(74)	12(17)
Tube well Irrigated	7(10)	51ss(73)	12(17)
Average	7(10)	52(74)	11(16)

The highest consumption of fuel wood was done by very large families (15-20) of 840 kg of fuel wood/ month. Maximum time of cooking was done in very large families only i.e. (124.5 hrs). So it can be concluded that total 7 kg of wood and 1 kg of dung cakes and 2.08 hours time per day per meal was required by the cook for preparing the meal for the large family. Therefore cooks were exposed to smoky atmosphere for this long hour's everyday. Consumption of kerosene oil was quite low and dung cakes were also consumed in large quantities besides fuel wood (Table 7). A fireplace operating burning 4 kg of wood for an hour generates 4,300 times more carcinogenic particles than 30 cigarettes. (Suresh, 2011)

Housing condition has a direct bearing on health; especially women health and indoor air pollution diseases are concerned. The parameters studied were type of house, number of rooms, location of kitchen and type of ventilation. Houses were mostly of kaccha or semi-pucca type. It was observed in many other studies that in kaccha or semi pucca type of houses prevalence of respiratory diseases was very high. About 45 percent of the houses had only one room (Table 8). It was observed that if there is less number of rooms in the houses, the chances of respiratory and eyes problems increase due to less dispersion of the smoke. Parikh and Laxmi (2000) found a negative correlation between number of rooms and respiratory diseases.

Each time the fire was ignited using bio fuels; it produced a lot of smoke and pollutants. In the same manner if cooking was performed in an enclosed area with poor ventilation and traditional stoves, exposure was much higher than cooking the meal in the open air kitchen. In the sample household's (Fig. 4) 46 percent in the rainfed areas do not have any kitchen or cooking space. In such types of kitchen exposure is

Table 7: Consumption of fuels and cooking hours as per family size (per month)

Family size	Fuels				
	Fuel wood (kg)	Dung cakes (kg)	Kerosene oil (l)	Cooking hours per month	Cooking hours per day per meal
Small (1-5)	525	120	5	90	1.5
Medium (5-10)	664	90	2	105	1.75
Large (10-15)	764	90	2	116	1.93
Very Large (15-20)	840	60	2	124.5	2.08

Table 8: Type of dwelling units of the selected respondent families (%)

Type of house	Rainfed	Tubewell irrigated	Canal irrigated
Kaccha	31(44)	28(40)	29(41)
Semi Pucca	26(38)	24(35)	25(36)
Pucca	13(18)	18(25)	16(23)

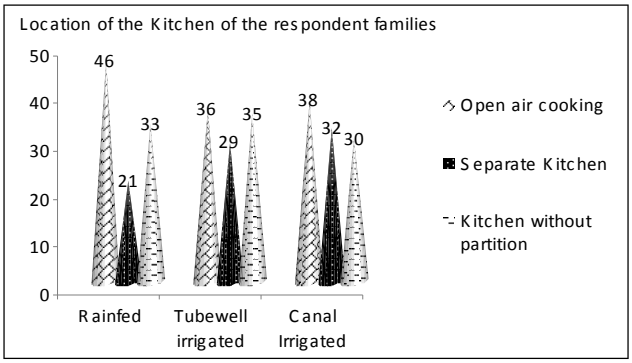

Fig. 4: Location of the Kitchen of the respondent families (%)

minimal for both cook and other family members, as the pollutant generated dissipated quickly in the air. Thirty five percent households of well irrigated areas had cooking space inside the living room itself due to which all other family members who are present during the cooking also get exposed to air pollutin, thirty two per cent in canal irrigated areas had separate kitchen outside the house. A chulla is 500 times more polluting than an oil burner and 1000 times more than heating with a gas (Suresh, 2011).

Health Problems: Mostly the female members of age above 15 years were the chief cooks. Those who were chief cooks have a greater risk of respiratory and eyes ailments. Therefore, location of kitchen and ventilation in the kitchen were very important determinants to other members of the household.

During the interview the information was self reported assessment of health problems by the respondents for using the poor quality fuel wood. Headache, giddiness, burning sensation in eyes, cough, breathing problems was the major health problems of the women. Headache (68%) and burning sensation (75%) in eyes were the major problems in all the villages while using poor quality fuel wood. (Table 9). Parikh and Laxmi (2000) in their study found that the concentration of respirable dust is highest when cooking is done inside the house in a kitchen without partition using biofuels in traditional stove.

Table 9: Health problems faced by the women involved in the cooking food (Percent)

Health problems	Rain-fed	Tube well irrig-ated	Canal irrig-ated	Average
Headache	69	67	68	68
Burning sensation in eyes	74	75	76	75
Eyes Irritation	69	73	71	71
Giddiness	33	35	34	34
Respiratory Problems	36	42	48	42
Cough	41	42	49	44

CONCLUSION

All the respondents' families were using simple chullah for cooking food in the selected areas. Only few of the households were using clean fuels like kerosene or liquid petroleum gas for cooking purposes, whereas majority were using fuel combination i.e. biomass and clean fuel. In rainfed areas phog (*Calligonum polygonoides*) was one of the quality fuel woods. On an average, rural women and children of all the selected areas of the study were devoting their maximum time for collection of fuel wood every fortnightly travelling at least 3-6 km per trip and devoting 4-6 hours for collection of fuel wood for cooking purposes. The total time required by the cook in cooking for average large family was 2.08 hours per day per meal and 20 kg of wood was required for cooking the food for the average large family. Headache (68%) and burning sensation (75%) in eyes were the major problems in all the villages while using poor quality fuel wood for cooking. One of the important findings was that the individuals who were inside the house during the cooking activity too face risk of high exposure. The results of the study suggests that opting for cleaner fuels, good ventilations, cooking technology and practices can substantially reduce the level of pollution. One of the reasons biomass energy has received so little attention in national energy planning is that it is seen as women fuel.

REFERENCES

Parikh J., K. Smith and V. Laxmi. 1999. Indoor Air Pollution, A reflection on Gender Bias: *EPW,* **34**(9) 539.

Parikh, J. and V. Laxmi. 2000. Biofuels, Pollution and Health Linkages, A survey of Rural Tamil Nadu: *EPW,* **35**(46): 4125-4137.

Suresh, A. 2011. Gender Tilt to Environmental Degradation, The Tribune; June, 2, 11.

Received on January, 2014, Revised on July, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 192-199, July-December, 2014

Structural and Functional Mechanism of Mobile Based Agro-advisory Services and Socio-Economic Profile of the Member Farmers

Madan Singh[1], R. Roy Burman[1], J.P. Sharma[1], V. Sangeetha[1] and M.A. Iquebal[2]
Division of Agril. Extension, ICAR-Indian Agricultural Research Institute, New Delhi-110012; [2]IASRI, New Delhi-110012

ABSTRACT

Among modern information and communication technology (ICT), mobile phone has been most recent and widely accepted mode of delivering information in most of the developing country including India. Increasing mobile phone and its services enhance the availability to access information and to increase awareness, education, better adoption of technology, better health and efficiency, reduced transaction costs, better market efficiencies, etc. As an information platform to receive messages–SMS or voice-message information provide the ability to get connected to new knowledge and information sources not previously available with the possibility of real-time, highly tailored information delivery. Most of Indian farmers are small and marginal so they cannot afford costly ICT based services. In this context, mKRISHI® which was started in 2006 is more appropriate as compared to all other ICT based projects in India because mKRISHI® operated through mobile phone is very cheap and affordable by farmers. After the early success in the promotion of sustainable farming practices through the use of localized message in local language in the Maharashtra state, it had been deployed to thirteen other states of the country. There were totally 11 languages in which message had produced in 13 states of the country. This unique approach is popular among farmers which resulted in better adoption of improved farm practices. Most of member farmers belong to young aged group, small farmer, high social participation and high contact with extension agency.

Keywords: ICT, mKRISHI®, Mobile phone

INTRODUCTION

Indian agriculture is essentially small farm agriculture with the majority of farmers owning less than 1 hectare land. Small and marginal farmers now constitute over 80 per cent of farming households in India. The average farm size has been declining. The land and water resource base for an average farm holding has declined over the last few decades. There are wide gaps in yield potential and national average yields of most commodities. "In addition to stressed natural resources and very inadequate rural infrastructure, there are clear evidence of technology fatigue, run-down delivery systems in credit, extension and marketing services and of insufficient agricultural planning at district and lower levels" (Planning Commission, 2011). Access to adequate information is very essential to increase agricultural productivity (Sharma *et al.*, 2012).

Agricultural extension services can play an important role in addressing many of these challenges. Perhaps, there is no agency at the ground level, other than agricultural extension services that can provide knowledge support to farmers and other intermediaries and at the same time support programme implementation. Considering the changing nature of agriculture and the evolving challenges, producers currently need a wider range of support, including organisational, marketing, technological, financial and entrepreneurial. To be successful, farmers require a wide range of knowledge from different sources and support to integrate these different bits of knowledge in their production context. Traditional public-sector extension services use a variety of extension programmes to overcome barriers to technological adoption without much success (Aker, 2010). Typically poor and illiterate, rural Indian farmers generally have very limited access

to information regarding improved farm techniques (Jain, 2011).

The extension workers and farmers ratio is very wide in India .This clearly indicates about the inadequate manpower of extension worker in India. All these things have made to think beyond the traditional agriculture extension and subsequently led to the increase application of ICT in agriculture. ICTs essentially facilitate the creation, management, storage, retrieval, and dissemination of any relevant data, knowledge, and information that may have been already been processed and adapted (Batchelor, 2002; Chapman and Slaymaker, 2002; Rao, 2007; Heeks, 2002). ICTs now include computer-based applications and such communication tools as social media, digital information repositories (online or offline), and digital photography and video, as well as mobile phones (Balaji *et al.*, 2007). However, in agriculture, despite the rapid spread and potential of ICTs to facilitate farmers' access to information, many of the initiatives face common challenges, such as issues of sustainability, affordability, ease of use, accessibility, scalability, and availability of relevant and localized content in an appropriate language (Keniston, 2002; Dossani, Misra, and Jhaveri, 2005; Saravanan, 2010). At present in India a number of ICT initiatives in agriculture. The modes for providing information vary in different ICT projects. The approach adopted by mKRISHI® is different from all other projects. The present study attempts to study the socio-economic profile of member farmers and conduct in depth documentation of organizational and functional mechanism of the well establishing mKRISHI® system i.e. Tata Consultancy Service (TCS).

MATERIALS AND METHODS

Two districts, one from each of the states of Maharashtra and Tamil Nadu were selected for the study purposively as mKRISHI® was started in these district in 2006. The districts were Nasik in Maharashtra and Kanchipuram in Tamil Nadu. The data was collected from 60 respondents from the mKRISHI® subscriber farmers. Besides the farmers, 20 staff person 10 from each state, associated with mKRISHI® were also interviewed. The genesis, growth and approach of mKRISHI® extension system were studied by using secondary sources, i.e. annual reports and the research papers. The website of mKRISHI® was also extensively used for this purpose. The beneficiary farmers, local mediators and the extension personnel who are involved in this were also interviewed to collect relevant information.

RESULTS AND DISCUSSION

Genesis of mKRISHI®: Farming is becoming a "dead" profession with many marginal farmers opting to leave their lands barren and migrating into the cities in the hope of a better life. This is leading to unprecedented choking of the cities' infrastructure and the situation has become worse. This situation has led to serious introspection within TCS and various initiatives leveraging technology to alleviate the issues in the agricultural sector have gathered momentum. The Progressive Rural Information & Digital Enterprise (PRIDE™) powered by the TCS mKRISHI® platform is one such initiative. The mKRISHI® platform, developed by Tata Consultancy Services(TCS) in 2006, enables farmers to access best-practice information and agricultural experts through low-cost mobile phones using SMS. The mKRISHI® project was started with the goal to develop a mobile agro advisory system to provide the benefits of the information and communication technology (ICT) to the rural farmers by enhancing their agricultural productivity, farming efficiency and improving their earnings. The long term goal of mKRISHI® is to bridge the barrier between the farmers and other stakeholders in their socio-economic ecosystem like agricultural experts, agri-business units, financial institutions, hospitals and many more utility providers. Multimedia technology was used at different stages in a rural farmer's ecosystem to assist them in many different ways.

mKRISHI® developed approaches that allowed a farmer to use audio-visual facilities. As is obvious, an expert cannot go to every farm to visit and inspect the context of the query, so it was decided to 'take the farm to the expert' using all current and historical multimodal, including visual, sensory measurements. The main contextual data elements of the mKRISHI® includes many different types of sensors, such as temperature, humidity, soil moisture, canopy temperature, canopy humidity and wind velocity, placed on the field with data loggers to communicate the observations to the mKRISHI® server. This information includes climatic conditions and events, soil conditions, rain and fertilization history, and the pesticide and insecticide history. By presenting all this information in the context of the farmer query, experts

diagnose the problem and promptly provide advice to the farmer in his native language. One of the challenges for mKRISHI® was to provide a scalable backbone to map fewer experts to large number of queries by the farmers.

Structural mechanism of mKRISHI®: Tata Consultancy Services (TCS) is an IT services, business solutions and outsourcing organization that delivers real results to global businesses, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT and IT- enabled services delivered through its unique Global Network Delivery Model™ recognized as the benchmark of excellence in software development. A part of the Tata Group, TCS has successfully employed innovative technology to add value to agriculture. One such initiative that it has introduced is mKRISHI®, which uses mobile phones and the sensor technology to give personalised advice to farmers. Conceived in October 2006, it was felt that mKRISHI® had the potential to create new markets and offer its services at a low cost. It was, therefore, positioned as 'disruptive innovation'. The concept of mKRISHI® grew out of a need for understanding and resolving the problems of farmers, especially issues that were voiced in meetings with several small and progressive farmers, government officials, agriculture university faculty, NGOs, experts from agro product companies and agriculture scientists from research labs to understand the problems faced by the farmers. In the absence of such a system, farmers were left unsupported, as they struggled to make sense of varied, often unpredictable, issues such as weather, quality of the crops, condition of the market, etc. mKRISHI® was planned as a mobile agro-advisory system that would allow farmers to send queries to agricultural experts in their local language through a mobile phone and receive personalised advice or relevant information in their local language. The service eliminates the hindrance that prevents illiterate farmers from accessing good technology.

Fig. 2 presented the staff pattern of mKRISHI®. At the apex level mKRISHI® with a country Head TCS and Head mKRISHI®. Under them Delivery Team manager operates at regional level. Under each region mKRISHI® has a set of project being implemented in selected districts. In each district, Project Managers are responsible to implement the project. The project

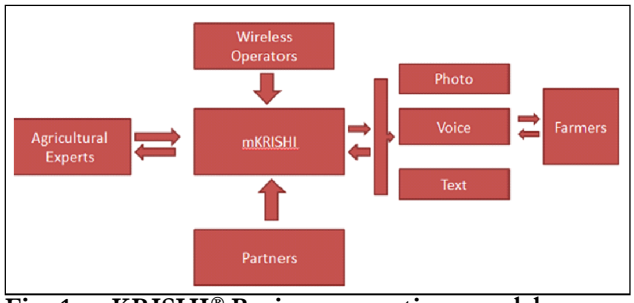

Fig. 1: mKRISHI® Business operations model

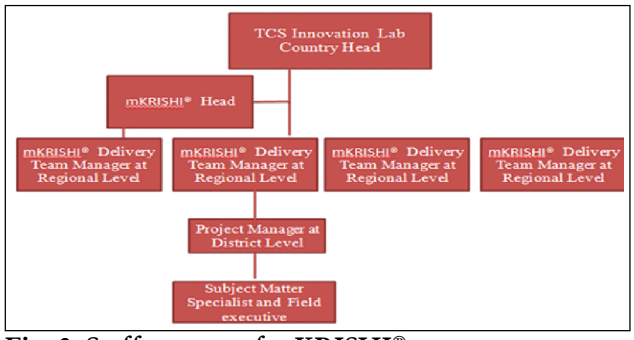

Fig. 2: Staff pattern of mKRISHI®

managers are supported by Subject Matter Specialist and Field Executive. In each *Taluka* generally 2-3 Field Executives are posted.

Approach of mKRISHI®: Farmer looks for specific, actionable information. Farmers are not just interested in remotely sent SMS, market information or agro advisory. To tackle this problem, mKRISHI® integrates agro-advisory services via calls and SMS with personal visits from field executives. Customers value personalisation and human interaction: Anecdotal feedback gathered from farmers indicates that they greatly valued the personalisation and face-to-face interaction with mKRISHI® field officers, providing the inclusive business with a sharp competitive edge. Hence mKRISHI® has a high-touch model for the rural market.

Role and responsibility of mKRISHI® and its linkage mechanism (Govt., NGO or Private): TCS is responsible for the creation of a tailor-made mKRISHI® platform as per the needs of the client. TCS provides the IT services and infrastructure for the agro-advisory service. mKRISHI® is currently being deployed for horticulture, pulses, fishery, dairy and sugarcane farmers in the 13 Indian states. In Maharashtra, Tamil Nadu, Haryana, Madhya Pradesh, Odisha, Uttar Pradesh, Gujarat, and Kerala, the

mKRISHI® field partners are FPOs(Farmer Producer Organizations) with anywhere between1,500 to 5,000 members registered on mKRISHI® powered PRIDE™ model.

Process of member registration, membership fee: TCS works in collaboration with NGOs, cooperatives, state governments or other agriculture related agencies to deploy the mKRISHI® - PRIDE™ model to a large group of farmers. Farmers are charged for the services in different ways. This include charging a transaction fee to input providers, retailers, advisory charges through membership, and other services such as animal husbandry and crop consultancy. mKRISHI® is focusing on establishing operating model and building an ecosystem.

The farmers are registered in online system. In farmer registration process around 250 data points are captured as per the project stage. It starts with personal details, farm details, family details, financial details, other proof of identity and residence details, buying and spending habits, etc. Membership fee was Rs 4000 for one year.

Geographical distribution of mKRISHI®: The service has been deployed in 13 major Indian states through 70 projects; namely Maharashtra, Andhra Pradesh, Gujarat, Orissa, Tamil Nadu, Punjab, Haryana, Uttar Pradesh, Madhya Pradesh and Bihar.

Languages in which message produced: Hindi, Marathi, Gujarati, Telugu, Kannada, Oriya, Malayalam, Bengali, Tamil, Punjabi and English are the main language in which mKRISHI® produce message.

Personnel involved in Functioning of mKRISHI®: There were four main personnel who conduct the smooth functioning of mKRISHI®. TCS head Hyderabad (Country level), mKRISHI® Head (Mumbai), Delivery Team Manager (Regional level) and Project Manager (District level). Under Project Manager there were number of Subject Matter Specialist and Field Executive in every block for carrying out effective function of mKRISHI®.

Table 1: Distribution of mKRISHI® staff according to their age (n=20)

Age category	Frequency	Percentage
Young (Below 35 years)	12	60
Middle (35-59 years)	8	40

Most of the staff (60%) belonged to young aged group while only 40 per cent were belonging to middle aged group.

Level of education: It was observed that the personnel involved with the mKRISHI® have agricultural education to understand the situation and need of the farmers. All of mKRISHI® staff belong to agriculture background among them 12 person have ABM/M.sc background in their respective subjects while 8 person completed B.Sc. in Agriculture.

Personal effectiveness of the staff: Personal effectiveness referred to the competence of the staff to meet with the need of the job. Out of 20, 95 per cent staff found themselves as competent enough to do their job. They have capability to do their job without any supervision. After entering the mKRISHI®, they involved themselves with the village people to understand their need. In their job they found themselves free with their work and which contributed to the success of the organization.

Orientation of staff towards mKRISHI®: Orientation towards mKRISHI® referred to how the staff perceived about the working condition within the organization. Most of the staff had the positive attitude with the organizational environment of mKRISHI®. They perceived that this could really contribute for the betterment of agriculture in India. It provided them the opportunity to interact with the villagers and make them able to learn about the rural situation.

Functional mechanism of mKRISHI®: Farmers need information on weather, soil, fertilizer and pesticide that are specific to their plot of land. They also need information and clarification about new types of seeds and crops that are available in the market. Further, local market price information for various agricultural produce is valuable to them. However, media broadcasts do not provide highly localized information. Culturally too, farmers only rely on their personal network for making crucial decisions related to fertilizer, irrigation, disease control, finance and so on. mKRISHI® uses advances in information and communication technology (ICT) to address such issues. Farmers can now receive information on microclimate, local *mandi* (market) price, expert's advice, and other information relevant to them, on a mobile phone.

Table 2: Functional mechanism of mKRISHI®

Item	Nasik	Kanchipuram
Number of registered farmers	3000	2500
Membership fee	Rs 4000/yr	Rs 4000/yr
Method of communications with member farmers	5-6 voice message/week	5-6 voice message/week
Method of farmer query	Through phone of field executive (android application)	Through phone of field executive (android application)

The mKRISHI® application enable farmers to send queries, comprising of text, voice and pictures, specific to their land and crop to agricultural experts using their mobile phones. The mKRISHI® ecosystem provides an integrated view of the farmers profile, farming history, and the required farm parameters on a console at a remote location to an expert. Farmers can also send pictures of their crops and pests captured with mobile phone cameras; sensors provide farm specific soil and crop data, weather stations provide microclimate details and voice based querying system gives freedom to the farmers to ask any query in their local (natural) language. After analysis of the available information, the expert's advice on the farmer's query is provided on the farmer's mobile phone.

Table 2 represented that mKRISHI® communicates with farmer through IVR (Interactive Voice Record), Voice call and messages. The number of message send by mKRISHI® was 5-6 messages per week to member farmer. The mKRISHI® field executive meets the farmer to solve their field problem. In case of the farmers want to generate query they contact the subject matter specialist and field executive who visits the member farmers at regular interval. The project manager, subject matter specialist and project executive have mobile handset with android application through which queries can be generated.

Table 3: Distribution of the farmers according to age (n=60)

Age	Beneficiary group	
	Frequency	Percentage
Young (35 years and below)	30	50.0
Middle aged (36-58 years)	26	43.3
Old (59 years and above	4	6.7
Total	**60**	**100**

Socio-personal variables of member farmers

Age: Table 3 showed the distribution of the farmers according to their age. Most of the farmers (50 %) were of young age.

Education: The educational levels of the respondents are reported in Table 4. It was observed that majority of the respondents (36.7%) had secondary level education.

Table 4: Distribution of farmers according to education level (n=60)

Education level	Beneficiary group	
	Frequency	Percentage
Illiterate	3	5.0
Functionally literate	1	1.7
Primary school	14	23.3
Secondary school	22	36.7
Higher secondary school	11	18.3
College and above	9	15.0
Total	**60**	**100**

Gender: The sex of the respondents is reported in Table 5. It was observed that majority of the respondents (86.7%) were male farmer.

Table 5: Distribution of farmers as per sex (n=60)

Gender	Beneficiary group	
	Frequency	Percentage
Male	52	86.7
Female	8	13.3
Total	**60**	**100**

Family Size: Table 6 showed the distribution of the farmers according to size of family. Most of the respondents (75%) belonged to medium sized family.

Table 6: Distribution of farmers as per size of family (n=60)

Size of Family	Beneficiary group	
	Frequency	Percentage
Small family size (Up to 3 members)	6	10.0
Medium family size (between 4 to 6 members)	45	75.0
Large family size (between 7 to 9 members)	5	8.3
Very large (More than nine members)	4	6.7
Total	60	100

Occupation: Table 7 illustrated the occupation of respondents to which they depend for their livelihood. It was apparent from the table that the occupation of most of the beneficiary farmers (63.3%) was farming and farming and business (36.7%).

Table 7: Distribution of farmers as per their occupation (n=60)

Occupation	Beneficiary group	
	Frequency	Percentage
Farming	38	63.3
Farming and Business	22	36.7
Total	60	100

Land holding: It was evident from the Table 8 that most of the farmers (30%) were small farmers and (26.7%) semi-medium farmers.

Table 8: Distribution of farmers based on land holding (n=60)

Land holding	Beneficiary group	
	Frequency	Percentage
0-1 ha (marginal farmer)	11	18.3
1-2 ha (small farmer)	18	30.0
2-4 ha (semi-medium farmer)	16	26.7
4-10 ha (medium farmer)	8	13.3
10 ha (large farmer)	7	11.7
Total	60	100

Farming experience: Table 9 showed the distribution of the farmers according to their farming experience. Most of the farmers (35%) were having farming experience between 11-15 years of and 16-20 years.

Table 9: Distribution of farmers based on farming experience (n=60)

Farming experience	Beneficiary group	
	Frequency	Percentage
(Upto 5 years)	1	1.7
(between 6-10 years)	5	8.3
(between 11-15 years)	21	35.0
(16 -20 years)	21	35.0
(More than 20 years)	12	20.0
Total	60	100

Annual household income: Table 10 showed the distribution of the farmers according to their annual household income. Most of the farmers (56.66%) were having high medium annual household income.

Table 10: Distribution of farmers based on annual household income (n=60)

Annual household income	Beneficiary group	
	Frequency	Percentage
(Below one lakh) –low	2	3.3
(1-3 lakh) medium	12	20
(3 to 6 lakh) high medium	34	56.66
(6 lakh and above) high	12	20.0
Total	60	100

Share of agriculture in total household income: Table 11 showed the distribution of the farmers according to their share of agriculture in total household income. Most of farmers (56.7%) were earn their household income from agriculture.

Table 11: Distribution of farmers according to share of agriculture in total household income (n=60)

Per cent share of agriculture in total household income	Beneficiary group	
	Frequency	Percentage
Agriculture	34	56.7
Non agriculture	26	43.3
Total	60	100

Social participation: It is clear from the Table 12 that 61.7 per cent member farmers were member of cooperative society and 28.3 per cent member farmers also had *gram panchayat* membership.

Mass media utilization: Table 13 showed the mass

Table 12: Distribution of farmers according to social participation (n=60)

Social participation	Beneficiary group*f* (%)		
	No membership	Membership	Official post
Gram Panchyat	43(71.7)	17(28.3)	3(5)
PanchyatSamiti	60(100.0)	0(0)	0(0)
Cooperative Society	21(35.0)	37(61.7)	2(3.3)
Mahilamandal	51(85.0)	6(10.0)	3(5.0)
KisanSangh	45(75.0)	14(23.3)	1(1.7)
Youth club	60(100.0)	0(0)	0(0)
Zilaparishad	60(100.0)	0(0)	0(0)
Block Development committee	60(100.0)	0(0)	0(0)
Self Help Group	60(100.0)	0(0)	0(0)

media utilization by the farmers. It depicted that farmers (50%) most often obtained the information from television and most of beneficiary farmers (60%) always read farm magazine for obtaining farm information.

Extension agency contact: The communication of the respondents with the extension agency is shown in the Table 14. Most of member farmers go to KVK for obtaining information regarding farm practices.

CONCLUSION

Presently, there are a lot of ICT based projects are running in India and trying to eradicate the digital divide in India. But the methodology adopted by mKRISHI®is quite different from all others ICT based projects and expected to meet the demand of farmers. In this context, mKRISHI® is more appropriate, very cheap and affordable by farmer and provide information to members in their local dialects. It also helped to reduce heterophily between scientists and farmers because of involvement of local people. It also resulted to develop faith for the extension workers among the farmers. In contrast to Meera *et al.* (2004) that staff for agricultural extension projects has inadequate training and farmers have very little faith in the ICT project personnel and their commitment to achieve the goals of the projects, mKRISHI® overcomes all such types of barriers and results in better adoption of technology by the farmers.

REFERENCES

Aker, J.C. 2008. Does Digital Divide or Provide? The Impact of Cell Phones on Grain Markets in Niger, Working Paper Number 154, Centre for Global Development, Washington, USA, October 2008. http://www.cgdev.org/content/publications/detail/894410/

Balaji, V., S.N. Meera and X. Dixit. 2007. ICT-Enabled Knowledge Sharing in Support of Extension: Addressing the Agrarian Challenges of the Developing World Threatened by Climate Change, with a Case Study of India. *SAT e-Journal*, 4(1): 18.

Table 13: Distribution of famers as per mass media utilization (n=60)

Mass media utilization	Beneficiary group *f* (%)				
	Never	Sometime	Often	Most often	Always
TV	0(0)	0(0)	5(8.3)	30(50.0)	25(41.7)
Radio	3(5)	11(18.3)	32(53.7)	7(11.7)	7(11.7)
News Paper	19(31.7)	5(8.3)	8(13.3)	1(1.7)	27(45)
Movies	33(55)	0(0)	9(15)	6(10)	12(20)
Farm Magazines	1(1.7)	3(5)	2(3.3)	18(30)	36(60)
Mobile	0(0)	1(1.7)	9(15)	5(8.3)	45(75)
Internet	38(63.3)	6(10)	8(13.3)	2(3.3)	6(10)

Table 14: Distribution of famers as per extension agency contact (n=60)

Extension agency contact	Beneficiary group*f* (%)						
	Never	Once in six month	Once in three month	Once in two month	Monthly	Fortnightly	Weekly
Govt. official	55(91.7)	0(0)	1(1.7)	2(3.3)	2(3.3)	0(0)	0(0)
Private extension staff	60(100)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Non Governmental organization	56(93.3)	0(0)	0(0)	4(6.6)	0(0)	0(0)	0(0)
Krishi Vigyan Kendra	0(0)	1(1.7)	10(16.7)	16(26.7)	18(30)	7(11.7)	8(13.3)

Batchelor, S. 2002. Using ICTs to Generate Development Content. IICD Research Report 10. The Hague: International Institute for Communication and Development.

Chapman, R. and T. Slaymaker. 2002. ICTs and Rural Development: Review of the Literature, Current Interventions, and Opportunities for Action. ODI Working Paper 192. London: Overseas Development Institute.

Dossani, R., D.C. Misra and R. Jhaveri. 2005. Enabling ICT for Rural India. Stanford, CA: Asia Pacific Research Center, National Informatics Center.

Heeks. 2002. Information Systems and Developing Countries: Failure, Success and Local Improvisations. *The Information Society,* **18**: 101–112.

Jain, S. 2011. Information Empowerment of Rural People in Agriculture through e-Choupal. *Journal of Community Mobilization and Sustainable Development,* **6**(1): 57-61.

Keniston, K. 2002. Grassroots ICT Projects in India: Some Preliminary Hypotheses. *ASCI Journal of Management,* **31**(1&2).

Meera, S.N., A. Jhamtani and D.U.M. Rao. 2004. Information and Communication Technology in Agricultural Development: A comparative analysis of three projects from India. AgREN Network Paper No.135, ODI, January 2004.20p. Available at: www.odi.org.uk/agren/papers/agrenpaper_135.pdf

Planning Commission 2011. Draft on Faster, Sustainable and More Inclusive Growth – An approach to Twelfth Five Year Plan", available at http://planningcommission.nic.in/plans/planrel/12appdrft/appraoch_12plan.pdf

Rao, N.H. 2007. A Framework for Implementing Information and Communication Technologies in Agricultural Development in India. *Technological Forecasting and Social Change,* **74**: 491–518.

Saravanan, R. 2010. India- In ICTs for Agricultural Extension. Global Experiments, Innovations and Experiences. New Delhi: New India Publishing Agency.

Sharma, A., A. Sharma and A. Saxena. 2012. Information utilization among rural fish farmers in Uttarakhand. *Journal of Community Mobilization and Sustainable Development*, **7**(1): 95-100.

Received on January, 2014, Revised on July, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 200-205, July-December, 2014

Problems and Ethno-Veterinary Practices of *Gujjars* and *Bakerwals* in Jammu Region

P.S. Slathia, Narinder Paul, Rakesh Nanda, Rajinder Peshin, S.K. Kher and V.P. Chahal
Sher-e-Kashmir University of Agriculture Sciences and Technology of Jammu, Main Campus Chatha, Jammu-180009, J&K

ABSTRACT

Gujjar and *Bakerwal* tribes in J&K state are known for livestock production in migratory mode. During the migration and livestock production the technical, social, economic, managerial and input supply related problems encountered by these tribes were studied. Threats from insurgents during migration, fear of attack of wild animals and shrinking grazing land and pastures, lack of knowledge and facilities for proper health care, low purchasing power along with the poor marketing infrastructures were major problems. Ethno-veterinary practices followed by the tribal livestock owners were also recorded.

Keywords: Ethno-veterinary, Tribal farmers, Socio-economic problems, Technical problems, Managerial problems

INTRODUCTION

In Jammu and Kashmir, *Gujjar* and *Bakerwal* tribes are stretched out in three areas of the state namely, Jammu, which comprises of various districts like Jammu, Kathua, Udhampur, Poonch, Rajouri; Kashmir Valley which consist of several districts like Srinagar, Baramulla, Kupwara, Pulwama, Budgam and Anantnag. Moreover, *Bakerwal* tribe is also settled in some parts of Ladakh consisting of Ladakh and Kargil districts.

Gujjar and *Bakerwal* constitute the two major nomadic tribal groups of Jammu and Kashmir. Both these tribal groups have livestock rearing as the prime vocation. Whereas, *Gujjars* possess large herds of buffaloes, *Bakerwal*s are associated with goat and sheep rearing. Both these tribal groups play a crucial role in meeting the requirement of milk and meat for the cities and towns and hence contribute significantly to the livestock sector of the state. Traditionally, both these tribes are nomadic in nature. They have seasonal migration from the plains of Jammu region to the upper reaches of Kashmir valley i.e. Pir Panchal, Seoj Dhar, etc. Moreover, before snowfall starts in the upper reaches, they migrate back to the plains of Jammu. It takes more than one month for these tribes to cover this distance during which they face a number of problems and travel through a tough terrain. These tribal groups are following this seasonal migration since time immemorial. The migratory grazier, who forms an insignificant proportion of the Gujjar population of the area, still practice the age old migration to subalpine and alpine pastures during summer. During winter they stay in the Shiwaliks, i.e., the lower most hills adjoining plains and do not go beyond the boundaries of the state as their ancestors used to do. The migration starts from Jammu by the middle of February and the flocks reach Udhampur by end of February when the *Gujjars* of Udhampur also start upward migration. The migratory route is almost parallel to the Jammu-Srinagar national highway; however, up to Ramban they adopt a shorter route avoiding the traffic hazards on the highway where they are often confronted with multitude of problems.

Keeping in view the importance of livestock for providing meat, milk and wool to the mankind and inherent involvement of tribes of Jammu and Kashmir in animal production, the present study was planned with the objective to study problems encountered by the nomadic tribes of Jammu and Kashmir in rearing livestock.

MATERIALS AND METHODS

Present investigation was carried out in Jammu Division of Jammu and Kashmir state. Jammu division comprises

of 10 districts of which districts of Jammu and Kathua were purposively selected for the present investigation as these contain majority of the nomadic tribes involved in livestock rearing. From these two districts 6 *kurus* (group of nomadic tribes) each of Gujjar and *Bakerwal* tribe were randomly selected. From each selected *kuru* of *Gujjars*, 5 Gujjar families were randomly selected thereby constituting 30 Gujjar families. The head of the family was selected as the respondent for the purpose of study. Likewise from the *kurus* of *Bakerwal*s, 5 *Bakerwal* families were randomly selected constituting 30 *Bakerwal* families. Similarly, head of the family was selected as respondent for the study. Thus, the study sample consisted of 30 Gujjar tribes and 30 *Bakerwal* tribes (60 total). Data regarding the problems and ethno-veterinary practices of the *Gujjars* and *Bakerwals* was collected personally with the help of a comprehensively designed interview schedule. The data so collected were subjected to suitable statistical analysis and collated accordingly.

RESULTS AND DISCUSSION

Problems encountered by the nomadic tribes of Jammu and Kashmir in rearing cattle: Problems encountered by the *Gujjars* and *Bakerwal*s have been studied under the different heads i.e. Technical problems, economic problems, social problems managerial problems and input supply problems

Technical problems encountered by the nomadic tribes in rearing cattle: Data presented in table 1 reveal that both the category of respondents belonging to the nomadic tribe of Jammu and Kashmir had lack of knowledge about improved breeds of cattle as the most severe problem encountered in the production and rearing of cattle and thereby had been ranked Ist by in the hierarchy of technical problems with mean percent score 85.55. This was followed by non-availability of proper health care practices during the period of their migration as the II most severe constraint faced by the tribes with MPS 76.66. Besides, lack of awareness about selection and breeding of animals (MPS 75) and lack of knowledge about veterinary pharmaceuticals (MPS 69.44) had been found to affect severely the Gujjar and *Bakerwal* tribes. In addition to it, lack of knowledge about improved house keeping practices (MPS 31.66), lack of knowledge about improved feeding practices, and lack of knowledge vaccination for deadly diseases of cattle (MPS 22.21) were also found to put shackles to the tribes, but to a less extent.

A comparative analysis of the technical problems encountered by both the categories of respondents separately reveal that non-availability of proper health care practices during the period as a constraint was assigned II rank in case of *Bakerwal* (MPS 75.55) and III in case of Gujjar respondents (MPS 77.77). Likewise, constraint associated with the lack of awareness selection and breeding animals for breed improvement was assigned IV rank in case of *Gujjars* (MPS 74.44) and III in case of *Bakerwal* tribes (MPS 75.56), lack of knowledge about vaccination for deadly diseases was assigned V rank by Gujjar (MPS 51.11) and VII rank by *Bakerwal*s (MPS 12.22). Similarly, lack of knowledge about vaccination for deadly diseases was found to be problem of VII order for Gujjar and V order for *Bakerwal* tribes.

Table 1: Technical problems encountered by the nomadic tribes in rearing cattle

Technical problems	Gujjar tribe		*Bakerwal* tribe		Total	
	MPS	Rank	MPS	Rank	MPS	Rank
Lack of knowledge about improved breed of animals	87.77	I	83.33	I	85.55	I
Lack of awareness about selection and breeding of animals for breed improvement	74.44	IV	75.56	III	75.00	III
Lack of knowledge about vaccination for deadly diseases	18.87	VII	25.55	V	22.21	VII
Lack of knowledge about improve house keeping for cattle	51.11	V	12.22	VII	31.66	V
Lack of knowledge about improved feeding practices	26.66	VI	18.88	VI	22.77	VI
Lack of knowledge about veterinary pharmaceuticals	86.66	II	52.22	IV	69.44	IV
Non-availability of proper health care practices during the period of migration	77.77	III	75.55	II	76.66	II

MPS: Mean Percent Score

Economic problems encountered by the nomadic tribes in rearing cattle: Date incorporated in table 2 reveal that non-availably of loaning facility for the *Gujjars* and *Bakerwals* came to be the most severe economic constraint encountered by the respondents with MPS 88.89, followed by, fewer market prices for milk, meat and wool products (MPS 74.44). In addition to it, high cost of vaccines and veterinary pharmaceuticals (MPS 59.44) and high cost of green fodder and other concentrates (43.88) were also found to affect both the categories of respondents with varying degree of magnitude.

A further deep glance at the data presented in Table 6 reveal that high cost of vaccines and veterinary pharmaceuticals was found to be the constraint of II order for *Gujjars* and of IV order for *Bakerwal*s. Besides, low purchasing capacity of nomadic tribes as economic constraint was assigned IV rank for *Gujjars* and II for *Bakerwal*s.

Social problems encountered by the nomadic tribes in rearing cattle: Data presented in Table 3 make it vivid that the threats from the militants during the period of their migration was found to be the most severe constraint affecting both categories of the respondents (MPS 89.99). This was followed by low living standard of *Gujjars* and *Bakerwals* (MPS 83.33), disintegrated social set up of tribes because of nomadic nature (MPS 73.33) and lack of awareness about social welfare schemes (MPS 65.55) as the prime social problems faced by the respondents. Besides, low educational standard of tribes (MPS 64.99) also came to be the major constraint faced by the respondents. In addition to it, considering tribes belonging to low category came to very lastly affects the tribes, followed by, least purchasing of produce of tribes by people with MPS 21.66 and 12.77, respectively. This reflects a very cosmopolite social set up in Jammu and Kashmir.

A comparative description of data presented in Table 3 reveal that lack of awareness about social welfare schemes for nomadic tribes was found to be IV order constraint for *Gujjars* and of V order for *Bakerwal*s. Contrarily, low educational standard of tribes as social constraint for tribes got V rank for *Gujjars* and IV rank by *Bakerwal*s.

Table 2: Economic problems encountered by the nomadic tribes in rearing cattle

Economic problems	Gujjar tribe		*Bakerwal* tribe		Total	
	MPS	Rank	MPS	Rank	MPS	Rank
Low purchasing capacity of nomadic tribes	61.11	IV	73.33	II	67.22	III
Non availability of loaning facility for *Gujjars* and *Bakerwals*	86.66	I	91.11	I	88.89	I
Less market price of the milk, wool and meat products	76.66	III	72.22	III	74.44	II
High cost of green fodder and other concentrates	52.22	V	35.55	V	43.88	V
High cost of vaccines and veterinary pharmaceuticals	72.22	II	46.66	IV	59.44	IV

MPS: Mean Percent Score

Table 3: Social problems encountered by the nomadic tribes in rearing cattle

Social problems	Gujjar tribe		*Bakerwal* tribe		Total	
	MPS	Rank	MPS	Rank	MPS	Rank
People disregard tribes as low category of people	18.88	VI	24.44	VI	21.66	VI
Milk and meat produced by *Gujjars* and *Bakerwals* is least purchased by people as they consider it produced by tribes	16.66	VII	8.88	VII	12.77	VII
Low educational standard of the tribes	61.11	V	68.88	IV	64.99	V
Lack of awareness about social welfare schemes for the nomadic tribes	72.22	IV	58.88	V	65.55	IV
Disintegrated social set up of tribes because of nomadic nature	74.44	III	72.22	III	73.33	III
Low living standard of *Gujjars* and *Bakerwals*	75.55	II	91.11	II	83.33	II
Threats from militants during migration	87.77	I	92.22	I	89.99	I

MPS: Mean Percent Score

Managerial problems encountered by the nomadic tribes in rearing cattle: Data incorporated in Table 4 reveal that poor herd management during the period of their migration was the severe constraint faced by respondents with MPS 82.77. This was followed by fear and attack of wild animals (MPS 70.49), lack of risk taking ability among tribes (MPS 69.99) and poor managerial capability of tribes (MPS 55.55) as the major managerial problems faced by tribes in animal rearing. Inability on part of the tribes to predict demand and supply of the produce was also perceived as constraint by the respondents but to comparatively less degree (MPS 35.55)

Comparative analysis of data presented in table 4 reveal that poor herd management during the period of migration and fear and attack of wild animals was perceived as constraint of I and III degree for *Gujjars* and of reciprocal degrees i.e. III and I in case of *Bakerwals*.

Input supply problems encountered by the nomadic tribes in rearing cattle: A perusal of data presented in Table 5 reveal that shrinking grazing land and pastures resulting into shortage of grazing pastures for the animals of nomadic tribes was the most severe constraint faced by the respondents in rearing cattle (MPS 87.21), followed by, scarcity of green fodder (MPS 83.88) and timely non-availability of veterinary aid (MPS 70.55). Besides, non-availability of high quality milk and meat producing animals (MPS 43.32) and non-availability of quality veterinary pharmaceuticals (MPS 31.11) were also perceived as problems by the respondents. Non-availability of concentrates was perceived as a constraint by the respondents to the least level (MPS 12.77)

A comparative analysis of the data presented for both the categories of the respondents separately reveal that shrinking grazing land and pastures was assigned I rank by *Bakerwal*s (MPS 95.44) and II by the *Gujjars* (MPS 78.88). Likewise, scarcity of green fodder was found to be constraint of I degree for *Gujjars* (MPS 92.22) and of II degree for *Bakerwal*s (MPS 75.55). Similarly, non availability of quality veterinary pharmaceuticals and non availability of high quality milk and meat producing animals were perceived as the problems of IV and V degree by *Gujjars* and of V and IV degree by *Bakerwal*s.

Overall problems encountered by the Gujjar and Bakerwal in livestock production: An overview of

Table 4: Managerial problems encountered by the nomadic tribes in rearing cattle

Managerial problems	Gujjar tribe		*Bakerwal* tribe		Total	
	MPS	Rank	MPS	Rank	MPS	Rank
Poor managerial capability of tribes	53.33	IV	57.77	IV	55.55	IV
Lack of risk taking ability	64.44	II	75.55	II	69.99	III
Poor herd management during the period of migration	93.33	I	72.22	III	82.77	I
Fear of attack of wild animals	62.22	III	78.77	I	70.49	II
Inability to predict demand and supply of the produce	38.88	V	32.22	V	35.55	V

MPS: Mean Percent Score

Table 5: Input supply problems encountered by the nomadic tribes in rearing cattle

Input supply problems	Gujjar tribe		*Bakerwal* tribe		Total	
	MPS	Rank	MPS	Rank	MPS	Rank
Scarcity of green fodder	92.22	I	75.55	II	83.88	II
Non availability of quality veterinary pharmaceuticals	35.55	IV	26.66	V	31.11	V
Non availability of concentrates	25.55	VI	0.00	VI	12.77	VI
Timely Non availability of veterinary aid	72.22	III	68.88	III	70.55	III
Non availability of high quality milk and meat producing animals	27.77	V	58.88	IV	43.32	IV
Shrinking grazing land and pastures	78.88	II	95.55	I	87.21	I

MPS: Mean Percent Score

the data presented in Table 6 reveal that the Gujjar respondents were primarily confronted with the economic problems which has been ranked 1st with MPS 69.77 followed by, managerial Problems (MPS 62.44), technical problems (MPS 60.46), social Problems (MPS 58.09) and input supply problems. In case of *Bakerwal*s, input supply problems topped the list of Problems under study with MPS 65.10 followed by, managerial problems (MPS 63.30), social Problems (59.51), technical Problems (49.04) and economic problems (45.55).

The overall calculated problems for both the categories of respondents came to be 58.86 which imply that such high degree of problems was being encountered by them in animal rearing. Overall managerial problems were perceived by both the categories of the respondents as the prime constraint in animal rearing with calculated MPS 62.90 followed by input supply problems (MPS 60.23), social problems (MPS 58.80), economic Problems (MPS 57.66) and technical problems (MPS 54.75). Similar findings were reported by Sharma *et al*. (2011) whereas input constraint was most serious constraint, followed by, general constraints, technical constraints, socio-cultural constraints and post-harvest constraints.

These findings confirm the findings of Sankhla (2006) who reported that timely unavailability of breeding related services, high quality concentrate feed, high cost of cross bred animals and lack of credit facilities are most important problems faced by respondents.

Ethno-veterinary practices followed by the nomadic tribes: Gujjar and *Bakerwal*s were found to

Table 6: Overall problems encountered by the Gujjar and *Bakerwal* in livestock production

Major category of problems	Gujjar tribe		*Bakerwal* tribe		Total	
	MPS	Rank	MPS	Rank	MPS	Rank
Technical Problems	60.46	III	49.04	IV	54.75	V
Economic Problems	69.77	I	45.55	V	57.66	IV
Social Problems	58.09	IV	59.51	III	58.80	III
Managerial Problems	62.44	II	63.30	II	62.90	I
Input supply Problems	55.36	V	65.10	I	60.23	II
Total	**61.22**		**56.50**		**58.86**	

MPS: Mean Percent Score

Table 7: Ethno-veterinary practices followed by the nomadic tribes of J&K

S.No.	Ethno-veterinary practices followed
1.	Asafoetida in lukewarm water or in combination with ajawain is used for controlling *Bloat/Tympany*.
2.	Raw milk with ginger extract is given to animals having *Constipation*.
3.	Rubbing of cedrus oil and application of alum on foot lesion is commonly used for controlling *Foot and Mouth diseases*.
4.	Mixture of cedrus oil and mustard oil in equal ratio are used for controlling S*kin Infection* in animals.
5.	Ajawain and gur (jaggery) in combination is fed to animals for controlling *Diarrhoea*.
6.	Lassi (Butter milk) in combination with asafoetida and mustard oil (in small proportion) is used for controlling *Bloat/ Tympany*.
7.	A mixture of milk, desighee, ginger and jaiphal is given to animals having *Mastitis*.
8.	Nomadic tribes keep *Bakerwal*i dogs to protect their livestock from wild animals.
9.	In case of *retention of placenta* during parturition, the Gujjar tribes have been found to follow the manual method of placenta removal. These are some skilled persons in the community who were found traditionally proficient in removal of placenta safely. One of such Gujjar namely Sher Ali was reported to be very proficient in this work.
10	Multhi roots (*Glycyrrhizaglabra*) roots with camphor are used for inhalation of animals suffering from respiratory problems.

follow a number of ethno-veterinary practices for the management of parturition related complicacies, disease management and insect pest management of cattle. Similar findings were reported by Mishra *et al*. (2011) and advocated integration with scientific knowledge.

CONCLUSION

It can be concluded from the findings that Gujjar respondents were primarily confronted with the economic problems followed by managerial problems, technical problems, social Problems and input supply Problems. Besides, *Bakerwal*s had input supply problems as the most severe followed by, managerial problems, social problems, technical problems and economic Problems. Overall, Lack of knowledge about improved breed of animals, Non-availability of loaning facility for *Gujjars* and *Bakerwals*, Threats from militants during migration, Fear of attack of wild animals and Shrinking grazing land and pastures, came to be the major problems confronted by the nomadic tribes of Jammu and Kashmir in livestock rearing.

REFERENCES

Mishara, O.P., A.K. Singh and S. Kumar. 2011. Indigenous knowledge of Bihar Farmers. *Journal of Community Mobilization and Sustainable Development,* **6**(1): 41-44.

Saha, A., B.M. Swapan and D. Gupta. 2006. Validation of Indigenous Knowledge in Healthcare System. *Indian Journal of Extension Science*, NDRI, Karnal.

Sankhla, G., M. Khan and B.C. Das. 2006. Problems faced by dairy entrepreneurs in adoption of improved dairy farming practices. *Indian Journal of Extension Science*, NDRI, Karnal.

Sharma, K., G. Singh, N.S. Dhaliwal and V.P.S. Yadav. 2011. Constraints in Adoption of Recommended Kitchen Gardening Techniques. *Journal of Community Mobilization and Sustainable Development,* **6**(1): 96-99.

Received on January, 2014, Revised on August, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 206-209, July-December, 2014

Prospects of Direct Seeded Rice Cultivation Technology in Haryana

A.K. Rohila, B.S. Ghanghas and P.S. Seharawat
Department of Extension Education, CCS Haryana Agricultural University, Hisar

ABSTRACT

The study focused on farmers' perception on prospects of Direct Seeded Rice Cultivation Technology in Haryana since it being a most feasible and sustainable alternative rice-ecosystem in view of depleting water resources, reduced labour use and climate risks are major concerns in conventional method of cultivation. Majority of respondent farmers agreed that DSR technology give better net returns in comparison to transplanting, interm of less water requirement, less labour requirement and best suited to climate change risks.

Keywords: Climate change, Direct seeded rice, Prospects

INTRODUCTION

Rice is the most prominent crop of India since it is the staple food of more than 70 per cent of population of the country. It also plays vital role in country's food security as well as providing livelihood to millions of rural households. India is the second largest producer of rice after China. Since independence its yield has increased four times due to increase in yield of improved varieties, area under rice approximately increased 40 per cent since 1950. In India demand for rice will increase because of population growth and change in dietary pattern. The increase in rice production has to come from higher yields because further expansion of area is not possible, in fact it is declining.

Therefore, the sustainability of rice-eco-system and ability to increase production in pace with population growth with reduced water and labour use and climate changes are major concerns in conventional method of cultivation of rice. Only direct-seeded rice (DSR) is feasible alternative with good potential to save water, reduce labour requirement, mitigation of green house gases (GHGs) emission and adaptability to climate risks.

Haryana is second largest state to contribute in central procurement pool of rice after Punjab. The yield is almost at par in case of basmati group if crop is properly managed for which CCS Haryana Agricultural University, Hisar have recommended package of practices of DSR cultivation in the year 2012. Presently, Haryana leads in production of aromatic basmati rice and more than 60 per cent export of basmati rice is undertaken from the state. Farmers of Haryana growing rice in conventional method are facing the severe problems of decreasing water table to the extent that most of the rice growing districts have been declared dark zones by the government and at the same time labour scarcity due to implementation of MNREGA in Bihar and other north eastern states from where migratory labour used to come. Ultimately these factors have increased the production cost.

Keeping in view the above facts and importance of this technology towards sustainable production of rice for the country as a whole and Haryana in particular, the study was conducted to find out the prospects of DSR cultivation technology

MATERIALS AND METHODS

The study was conducted in Haryana state. Four districts Yamuna Nagar, Kurukshetra, Karnal and Kaithal were selected purposively because maximum cultivation of rice is under these four districts. From each district, one block with maximum area under DSR culture was selected purposively viz. Sadhaura from

Yamuna Nagar, Shahbad from Kurukshetra, Assand from Karnal and Pundary from Kaithal. Further two villages, namely, Sarawan and Peerbholi villages from block Sadhaura, Malikpur and Basantpura villages from block Shahbad, Rugsana and Chochra villages from block Assandh and Faral and Habri villages from block Pundri were selected because maximum DSR culture was under these villages. From each village, 15 farmers were selected randomly, who were growing rice in DSR culture, making a total of 120 farmer respondents. The data were collected with the help of well structured interview schedule.

RESULTS AND DISCUSSION

Production related prospects of DSR cultivation technology: Table 1 elaborates the results pertaining to production related prospects of DSR cultivation technology in which majority of the farmers agreed on 'better economic returns in comparison to transplanting' with weighted mean score 2.95 occupied 1st rank, 'direct-seeded rice (DSR) cultivation require less water than transplanting' with weighted mean score 2.93 occupied 2nd rank, followed by 'low production cost due to fully crop mechanization' 'your past experience favours the direct-seeded rice (DSR) over transplanting' 'farmer friendly being easy to produce' 'better quality of crop produce' and 'early maturity (7-10 days) results in timely sowing of succeeding crops' with weighted mean scores of 2.82, 2.78, 2.72, 2.68 and 2.29, respectively.

'Better economic returns in comparison to transplanting' as major prospect followed by 'direct-seeded rice (DSR) cultivation requires less water than transplanting' and 'low production cost due to fully crop mechanization' were perceived highly prospective aspects of technology. Whereas farmers were either undecided or disagreed on the aspects such as. 'farmer friendly being easy to produce,' 'better quality of crop produce'. and 'Early maturity (7-10 days) results in timely sowing of succeeding crop' Which may be due to their poor knowledge or ignorance of these aspect. Singh *et al.* (2013) reported that farmers don't have full knowledge of scientific cultivation practices. It can be concluded that farmers are ready to adopt this technology due to better economic returns, requiring less water than traditional method and low production cost due to mechanization. Findings are in agreement with those of Tripathi (2004) who reported higher net returns over conventional transplanting. The findings of the study are in consonance with the study of Gill *et al.* (2006) who reported increased water productivity in case of DSR over transplanting.

General Prospects of DSR cultivation technology: Results pertaining to general prospects of DSR cultivation technology presented in Table 2 indicate that 'it is better being less labour requiring technology' with weighted mean score (2.92) occupied 1st rank, 'in case Govt. provides facility would you take up this technology as replacement of the transplanting' with weighted mean score (2.89) occupied 2nd rank, 'demand is increasing day by day in view of depleting water resources' with weighted mean score (2.85) occupied 3rd rank and 4th rank was given to 'best rice production technology in water crisis situation' with weighted mean score (2.83), while 'best resource conservation technology in food crops production system' with

Table 1: Production related prospects of DSR cultivation technology (n=120)

Aspects	Prospects level			Total weighted score	Weighted mean score	Rank order
	Agree	Undecided	Disagree			
Better quality of crop produce	92(76.67)	17(14.17)	11(9.16)	321	2.68	VI
Better economic returns in comparison to transplanting	116(96.66)	2(1.67)	2(1.67)	354	2.95	I
Farmer friendly being easy to produce	90(75)	26(21.67)	4(3.33)	326	2.72	V
Low production cost due to fully crop mechanization	102(85)	14(11.67)	4(3.33)	338	2.82	III
Early maturity (7-10 days) results in timely sowing of succeeding crop	39(32.5)	77(64.17)	4(3.33)	275	2.29	VII
Direct-seeded rice (DSR) cultivation require less water than transplanting	113(94.17)	5(4.16)	2(1.67)	351	2.93	II
Your past experience favours the direct seeded rice (DSR) over transplanting	102(84)	9(7.5)	9(7.5)	333	2.78	IV

weighted mean score (2.58) occupied 5th rank, 'easy availability of power machinery like seed drill, sprayer and harvesters, etc.' with weighted mean score (2.55) occupied 6th rank, 'better input facilities are available' and 'better credit facilities are available at present' with weighted mean score (2.33) and (2.27) occupied 7th and 8th rank, respectively, whereas 'better technical support is available' occupied 9th rank, 'higher fertilizer use efficiency due to its placement in the root zone' occupied 10th rank and 'better export facilities are available' occupied 11th rank with weighted mean score 2.23, 2.16 and 2.05, respectively.

The study reported that 'It is better being less labour requiring technology' as main prospect. The respondent farmers agreed that In case Govt. provides facilities they are ready to take up this technology as replacement of the transplanting' was second main general prospect of DSR cultivation technology followed by 'demand is increasing day by day in view of depleting water resources', and 'best rice production technology in water crisis situation', prospective aspects agreed by farmers. Farmers of Punjab and Haryana are facing labour problem for transplanting due to shortage of migratory labour from Bihar and other states which have implemented MNREGA scheme. Similar findings were reported by Kaur *et al.* (2011). Use of submersible pump for irrigation is a clear indication of depletion of water sources and government has declared dark zones in these rice growing districts so DSR is the best alternative to save these dark zones to become darker. Some times when farmers get higher prices in the market they even go for basmati rice cultivation in areas without assured irrigation or delayed onset of monsoon or early departure of it may create water crisis situation, in such situation the technology is most suitable. The findings of the study are in line with those of past researches of Abdolhamid *et al*. (2010). The finding of the study seems in agreement with scientifically proven facts like better water productivity and higher input use efficiency technology by past researches of Singh *et al.* (2005) and De (2010).

Prospects of DSR cultivation technology related to climate change: Results regarding prospects of DSR cultivation technology related to climate change. presented in Table 3 clearly indicate that it is 'best suited to climate change' with weighted mean score (2.66) occupied first rank, followed by 'an environment friendly technology due to no burning of rice residues' with weighted mean score (2.21) occupied second rank, 'reduces the risk in unfavourable weather condition' with weighted mean score (2.13) occupied third rank and 'mitigation of the green house gasses emission' with weighted mean score (1.57) occupied fourth rank.

Findings concluded that this technology is. 'best suited to climate change' followed by 'an environment friendly technology due to no burning of rice residue' and 'reduces the risk in unfavourable weather condition'

Table 2: General prospects of DSR cultivation technology (n = 120)

Aspects	Prospects level			Total weighted score	Weighted mean score	Rank order
	Agree	Undecided	Disagree			
Demand is increasing day by day in view of depleting water resources	109(89.17)	9(7.5)	4(3.33)	343	2.85	III
Better technical support is available	63(52.50)	21(17.5)	36(30)	267	2.23	IX
Better credit facilities are available at present	61(50.83)	30(25)	29(24.17)	272	2.27	VIII
Easy availability of power machinery	71(59.17)	44(36.67)	5(4.16)	306	2.55	VI
Better input facilities are available	65(54.17)	30(25)	25(20.83)	280	2.33	VII
Higher fertilizer use efficiency due to its placement in the root zone	30(25)	79(65.83)	11(9.17)	259	2.16	X
Best resource conservation technology in food crops production system	76(63.33)	38(31.67)	6(5)	310	2.58	V
Best rice production technology in water crisis situation	107(89.17)	6(5)	7(5.83)	340	2.83	IV
Better export facilities are available	30(25)	67(55.83)	23(19.17)	247	2.05	XI
In case Govt. provides facility would you take up this technology as replacement of the transplanting?	109(90.83)	9(7.5)	2(1.67)	347	2.89	II
It is better being less labour requiring technology	113(94.17)	4(3.33)	3(2.5)	350	2.92	I

Table 3: Prospects of DSR cultivation technology related to climate change (n = 120)

Aspects	Prospects level			Total weighted score	Weighted mean score	Rank order
	Agree	Undecided	Disagree			
Reduces the risk in unfavourable weather condition	35(29.17)	66(55)	19(15.83)	256	2.13	III
Best suited to climate change	84(70)	31(25.83)	5(4.17)	319	2.66	I
Mitigation of the greenhouse gases emission	3(2.5)	62(51.67)	55(45.83)	188	1.57	IV
An environment friendly technology due to no burning of rice residue	52(43.33)	41(34.17)	27(22.5)	265	2.21	II

were major prospective aspects agreed by farmers favouring adoption of technology while 'mitigation of the green house gases emission' ranked last may be due to their poor knowledge. It can be concluded that this is most feasible technology for ensuring food security in prevalent scenario of climate change everywhere and there.

CONCLUSION

Vast majority of farmers agreed with better economic returns in comparison to transplanting and also water saving technology in comparison to conventional method for production related prospects of DSR technology, while about 95 per cent respondents agreed that less labour requiring technology in comparison to transplanting and they were ready to replace the conventional method, if the government provides sufficient facilities for cultivation of basmati rice in the form of remunerative prices, MSP, proper procurement policy, quality inputs, etc. Majority of the respondents agreed upon its suitability for changing climate, a major challenge before farming.

REFRENCES

De Bibhas Kanti. 2010. Employment and Income Generation in Paddy cultivation through Sri in Tripura. *Journal of Community Mobilization and Sustainable Development*, **5**(2): 87-91.

Gill, M.S., A. Kumar and P. Kumar. 2006. Growth and yield of rice *(Oryza saliva)* cultivars under various methods and times of sowing. *Indian Journal of Agronomy,* **51**(2): 123-127.

Kaur, M., A.K. Mahal and M.K. Sekhon. 2011. Adoption of labour-saving technology in paddy transplantation-micro-level evidences from Punjab. *Agricultural Economics Research Review*, **24**: 568.

Pathak, H., A.N., Tewri, S. Sankyan, D.S. Dubey, U. Mina, U.K. Singh, N.B. Jain. 2011. A Direct-seeded rice: potential, performance and problems a review. *Current Advances in Agricultural Sciences*, **3**(2): 77-78.

Singh, R., B.S. Hansra and R. Chand. 2013. Knowledge and Adoption Level of Farmers of Haryana about Scientific Rice Cultivation Practices. *Journal of Community Mobilization and Sustainable Development,* **8**(1): 24-28.

Singh, Y., G. Singh, V.P. Singh, P. Singh, B. Hardy, D.E. Johnson and M. Mortimer. 2005. Direct seeding of rice and weed management in the irrigated rice wheat cropping system of the Indo Gangetic Plains. Directorate of Experiment Stations, G.B. Pant University of Agriculture and Technology, Pantnagar, India.

Received on February, 2014, Revised on September, 2014

Journal of Community Mobilization and Sustainable Development Vol. 9(2), 210-213, July-December, 2014

Factors Contributing to Success and Sustainability of Farms Produce Promotion Society (FAPRO)

Subhashree Sahu[1], J.P. Sharma[1], R.R. Burman[1], Premlata Singh[1], N.V. Kumbhare[1] and Eldho Varghese[2]
[1]Division of Agricultural Extension, Indian Agricultural Research Institute, New Delhi-110012
[2]Division of Agricultural Statistics, IASRI, New Delhi-110012

ABSTRACT

The present research study was conducted in Farms Produce Promotion Society (FAPRO) in Hoshiarpur of Punjab. The data were collected from the 90 members and the ten officials of the organisation. The study revealed that the most important factors contributing to success in the organisation were adoption of improved technology and modern infrastructure, well established links with market, certification of the produce and access to credit facilities. The study showed that the numbers of members, villages covered, outlets, activities undertaken were continuously increasing in the organisation. The days of employment generated and annual turnover was also rising over the years. Thus, it can be inferred that the organisations are sustainable and are still continuously growing.

Keywords: Infrastructure, Market, Economic efficiency, Social equity, Environmental accountability

INTRODUCTION

The effectiveness of farmers' organisations (FOs) depends on their internal strength and cohesion, capacity to arrange for major investments and a continuous flow of raw materials. Chamala (1995) identified factors influencing group effectiveness, which were categorised under (1) internal factors (2) supporting agency factors, and (3) community factors. The internal factors influencing organisational effectiveness are group composition, group structure and size, group atmosphere, cohesion, group standards and norms, leadership style, balance between group maintenance needs, individual needs, and task needs, development phase of the group, and group culture. The supporting agency factors contributing to group effectiveness are technical capabilities of extension staff, staff's 'people skills' in managing groups, staff attitude and commitment to groups, types of planning methods used (directive or participative, top-down or bottom-up, or balance of methods to maximize participation), means or ends distinction (some groups are formed as means for development, while others are formed to harvest Government subsidies). Community factors (factors present in the community in which the group exists) also influence a group's success. Collective action is crucial for survival and sustainable development (Ostrm, 1990). Sexton and Iskow (1988) distinguished three groups of organizational, financial, and operational keys to success of agricultural cooperatives. Membership commitment, measured by the financial contributions of the members, appears to be a strong and positive predictor of performance (Ragasa and Golan, 2012; Meinzen-Dick, 2009). It is important to educate the members regarding the importance of interpersonal relationships and group cohesiveness in achieving the goals of the group for enhancing the effectiveness of the group and increasing its efficiency (Sidhu, 2009). Major factors influencing the effectiveness of farming groups were found to be level of education, social participation, economic motivation, group dynamics and support from the promoting institution (Sajesh and Ramasundaram, 2013). In this context, the present study was undertaken to isolate the factors for success and sustainability of the farmer organisations.

MATERIALS AND METHODS

The organisation FAPRO located in block Bhunga, Hoshiarpur district of Punjab was studied. In order to

identify the factors contributing to success and sustainability of organisation, the responses of the randomly selected ninety members and ten officials were analysed. The factors were categorized under different heads of technical and organisational variables, economic variables and marketing variables. The members were asked to rate the identified factors on a scale of 1 to 5, based on their perceptions about the strength of the specific variable. Friedman non-parametric test was used to identify the most important factor contributing to success of the organisation within each of these broad categories. In order to find out the factors contributing to sustainability, data were collected from the officials on various categories of organisational variables and economic efficiency variables for subsequent years- 2001, 2007 and 2013. The officials were also enquired about the environmental accountability of the organisation. The members of the organization were asked about the social equity of the organisation.

RESULTS AND DISCUSSION

An organisation's strength is determined by the strength of its technical, marketing and economic variables. Friedman test identified the most important factors within these categories, contributing to success.

Table 1: Comparison of different technical and organisational variables based on mean rank as per Friedman test (n = 90)

Statements	FAPRO
Brings out farm publication and literature for its members	1.10
Skilled members	1.95
Tie-up with the agricultural universities to facilitate access to improved technology and expert advice	4.75
Provides extension support	4.93
Regular audit	4.93
Provides timely inputs	5.07
Adoption of improved technology and modern infrastructure	5.27

Factors contributing to success of organization: Table 1 shows that the major success contributing factors under the category 'Technical and organisational variables' was the adoption of improved technology and modern infrastructure in the organisation followed by the provision of timely inputs, extension support to its members and regular auditing of the organisation.

Table 2: Comparison of different marketing variables based on mean rank as per Friedman test (n = 90)

Statements	FAPRO
Well developed processing facilities	1.00
Well equipped transport facilities	2.53
Well built market intelligence system to provide timely and reliable market information	3.93
Grading and packaging of the produce	6.32
Enterprise diversification	6.33
Quick payment to farmers	6.47
Elimination of middlemen	6.47
Improved storage structures	7.22
Certification of the produce	7.37
Availability of suitable market for the produce	7.37

Table 2 clearly indicates that members of FAPRO perceived the availability of suitable market, product certification and improved storage structures as the most crucial marketing factors that contribute to organisational success.

Table 3: Comparison of different economic variables based on mean rank as per Friedman test (n = 90)

Statements	FAPRO
Access to credit facilities	2.57
Government support	2.43
Private/ NGO funding	1.00

Finance always has remained to be a major directing factor for the success of the organisation. Table 3 shows that in case of economic variables, FAPRO had access to Government funding and the members had access to credit easily through banks, which in turn ensured the economic security for the organisation that directly contributes to success.

Measurement of sustainability: Balance of economic efficiency, social equity and environmental accountability is essential for sustainability of an organisation. For measuring the sustainability of the organisations under study, data were collected under four broad headings of organisational statistics, economic efficiency, social equity and environmental accountability.

The above sited Table 4 depicts the data collected on various organisational variables of FAPRO over subsequent years of 2001, 2007 and 2013. Under the

Table 4: Organisational statistics of FAPRO in numbers

Years	Members	Villages covered	Outlets	Activities
2001	174	35	4	2
2007	308	55	15	9
2013	380	100	30	15

organisational variables, the sub-categories taken were- number of members of the organisation, number of villages covered, number of outlets or shops opened and number of activities undertaken. The membership of FAPRO increased from 174 in 2001 to 380 in 2013. Similarly, the number of villages covered steadily increased from 35 to 100 and that of outlets increased from 4 to 30. The organisation was initially involved in sole marketing of honey and turmeric but since then, it has diversified the organisational activities by including marketing of turmeric, honey, *besan*, jaggery, flour, pulses, sugar, *kadi pakoda*, soya nuts, *masala*, mustard oil, juice, pickle, *chutney*, wheat seeds procured from NSC, etc.

Economic efficiency: The economic efficiency of the organisation was calculated in terms of number of days of employment generated, funds from donor agencies (rupees in lakhs), portion of profit (%) invested back in business and annual turnover (rupees). The number of days of employment has subsequently risen from 32,000 to 70,000 and so has the annual turnover, which saw growth from Rs.10 lakhs to Rs. 2 crore in 2013. The above table shows that the funds received by the organisation is decreasing steadily, which shows that the organisation is becoming more self-sufficient day by day and is gradually decreasing its share of financial assistance from the external funding agencies. This was possible because of the increasing portion of investment of profit back in the organisation.

Table 5: Economic efficiency of FAPRO

Years	No. of days of employment generated	Funds	Portion of profit (%)	Annual turnover
2001	32000	75 lacs	70	10 lacs
2007	55000	40 lacs	80	50 lacs
2013	70000	35 lacs	100	2-3 cr

Social equity: Social equity was measured in terms of the following statements listed below in Table 6. Responses to these statements were collected from members of the organisation in terms of agreement or disagreement. Based on their responses, frequency and percentage analysis was carried out. The table below depicts that all the members in the organisation opined that the organisation implements social equity in all its activities and operations.

Table 6: Social equity of FAPRO

Statements		FAPRO	
		f	%
Equitable access to organisational assets	Agree	90	100
	Disagree	0	0
Involvement of poor and marginal farmers in the organisation	Agree	90	100
	Disagree	0	0
Ethical & transparent dealings	Agree	90	100
	Disagree	0	0

Table 7: Environmental accountability of FAPRO

Statements		FAPRO	
		f	%
Are the products produced in conditions and processes that confer that confer to the international ISO standards?	Yes	10	100
	No	0	0
Are the products certified by a nationally recognized agency?	Yes	10	100
	No	0	0

Environmental accountability: Environmental accountability was measured by the following two statements and based on the responses of the ten officials in the organisation, frequency and percentage analysis was carried out. The table below shows that all the officials of FAPRO shared the opinion that the organization is environmentally accountable, as the products were ISO certified (Table 7).

CONCLUSION

The most important factors contributing to success in FAPRO were adoption of improved technology and modern infrastructure, well established links with market facilities, certification of the produce and access to credit facilities. The study revealed that the number of members, villages covered, outlets, activities undertaken by the organisation has increased over the years. The number of days of employment generated and annual turnover was also rising over the years. The organisation portrayed high degree of social equity and environmental accountability. Thus, it can be inferred that the organization is sustainable.

REFERENCES

Chamala, S. 1995. Group effectiveness: From group extension methods to participative community Landcare groups. In: S. Chamala and K. Keith (eds.), Participative approaches to Landcare: Perspectives, policies and programs. Brisbane: Australian Academic Press.

Meinzen-Dick, R.S. 2009. Coordination in Natural Resource Management."In Institutional Economics Perspectives on African Agricultural Development, edited by J. F. Kirsten, A. R. Dorward, C. Poulton, and N. Vink. Washington, IFPRI.

Ostrom, E. 1990. Governing the Commons: the Evolution of Institutions for Collective Action. Cambridge: Cambridge University Press.

Ragasa, C. and J. Golan. 2012.The Role of Rural Producer Organizations for Agricultural Service Provision in Fragile States. Discussion Paper 01235. Washington, IFPRI.

Sajesh, V.K. and P. Ramasundaram. 2013. Effectiveness of Collective Farming Under Kudumbasree programme of Kerala. *Journal of Community Mobilization and Sustainable Development*, **8**(2): 276-281.

Sexton, R.J. and J. Iskow. 1988. Factors critical to the success or failure of emerging agricultural cooperatives. *Giannini Foundation Information Series,* **88**(3).

Sidhu, K. 2009. Capacity Building for Efficiency Enhancement of Self Help Groups.*Journal of Community Mobilization and Sustainable Development*, **4**(1): 80-83.

Received on October, 2013, Revised on July, 2014

AUTHOR GUIDELINES

1. Society for Community Mobilization for Sustainable Development (MOBILIZATION) welcomes original articles. Articles (not exceeding 25,00-3,000 words) must be typed on one side of the paper, double-spaced, with wide margins on all four sides. An abstract (not exceeding 100-120 words) must accompany the article. The format followed must be Title, Name of the author(s), their affiliation, abstract, introduction, methodology, major findings, conclusion and reference.

2. E-mail the article in original as an attachment in MS Word to *journalmobilization@yahoo.com*. The author(s) should furnish a certificate stating that the paper has neither been published nor has been submitted for publication elsewhere.

3. Within the text, adopt the author-date method of citation minus the comma, for example, (Singh 2002). If more than one work of the author is cited, separate the years of publication with a comma (Pandey 1996, 1999). When more than one author is cited, the entries should be chronological with works of different authors separated by a semicolon (Pareek 1990; Sinha 1994; Dixit 1997). If gazetteers, reports and works of governmental organizations are cited, mention the name of the organisation/institution sponsoring the publication in the citation, fully spelt out at its first occurrence (Government of India 2003), and use its abbreviation/ acronym in subsequent citations (GOI 2003).

4. Give separately the bibliographic details of all works cited in the article under References in the following sequence: (a) Article: the name(s) of the author(s); the year of publication; title of the article (within single inverted commas); the name of the journal (italicised); and the volume number, the issue number, the beginning and ending page numbers. (b) Chapter in an edited work or compilation: the names(s) of the author(s); the year of publication; title of the chapter (within single inverted commas); the name(s) of the editor(s)/compiler(s); title of the book (italicized); the beginning and ending page numbers of the chapters; place of publication; and the name of the publisher. (c) Book: the name(s) of the author(s); the year of publication; title of the book (italicized); place of publication; and the name of the publisher. The listing in References must follow the alphabetical order of the last name of the (first) author.

5. Use British, rather than American, spellings (labour, not labor; programme, not program). Similarly, use's', rather than 'z', in 'ise', 'ising', 'isation' words.

6. Write numerals between one and ninety-nine in words, and 100 and above in figures. However, the following are to be in figures only: distance: 3 km; age: 32 years old; percentage: 64 percent; century: 20th century; and years: 1990s.

7. Contributors are also required to provide on a separate sheet their name, designation, official address and E-mail ID.

8. All tables, charts and graphs should be typed on separate sheet. They should be numbered continuously in Arabic numerals as referred to in the text.

9. Author(s) should be the life member of the Society.

CONTENTS

Printed and Published by Dr. J.P. Sharma, President, Society for Community Mobilization for Sustainable Development, Division of Agricultural Extension, IARI, New Delhi-110012