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ABOUT THE SOCIETY

MOBILIZATION Society was established in 2003 as a 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 827 Life Members. The recognition of the Society in the efforts for strengthening the forum for scientific communication is growing among the related professionals and concerned agricultural stakeholders rapidly. The Society works on following objectives-

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

ABOUT THE JOURNAL

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

The aim and scope of the journal are:

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

Editorial

Agricultural extension is at crossroads. At one side there is increasing information need of the stakeholders in context of challenges and uncertainties in agriculture and on the other hand securing livelihood of smallholders including augmenting farm income. Earlier the agricultural system was production based but modern agriculture sector is to be developed essentially on the lines of market based economy. Earlier, a farmer who produced more was considered successful farmer. But now the farmer, who earns more is considered successful. Competencies are to be developed in effective marketing, presentation and quality maintenance on lines of national and international standards. Subsistence farming can no more bring prosperity to the farmers, rather farming has to be business oriented. Farmers as well as the other stakeholders should work to make farming a profitable business venture. Practicing commercial agriculture will demand precision use of inputs for cost-effectiveness, quality production and handling of produce, chemical less management of biotic and abiotic stresses in production; speedy inter-connectedness with fellow partners, traders and marketing networks; preparedness on their own part to cope up with such challenging tasks with acquisition of newer technical knowledge as well as managerial and entrepreneurial skills.

Entrepreneurship in agriculture is being talked about for last more than two decades, but it is more relevant in present context. Extension professional has a great role in promoting entrepreneurship, identify potential entrepreneurs and link them to the market. Challenges in domestic as well as global marketing arena are also to be taken into account. Rural youth need to be sensitized to all the developments and opportunities in the domestic and international market. They need to be empowered to take care of their individual & village development needs and finally contributing to the nation building.

Society for Community Mobilization for Sustainable Development (MOBILIZATION) is always striving for stimulating stakeholders including researchers and extension professionals, innovative farmers and students through the *Journal of Community Mobilization and Sustainable Development*. Some of the papers contained in this issue specifically focus on information need assessment for empowering rural women, information dynamics for designing cyber extension model, participation of farm women in livestock management, acceptability of drudgery reducing hand tools, theoretical perspective on research-extension-farmer linkage, impact of active learning programme, impact analysis, adoption of IPM, determinants of micro finance and credit institutions in farm business, constraints in availing agricultural insurance, training needs of stakeholders and sustainable livelihood security of tribal farmers.

I extend my heartfelt thanks to the members of the editorial team - Drs. Shantanu Kumar Dubey, R. Roy Burman, Rupasi Tiwari, R. K. Dhaliwal, Souvik Ghosh, M. S. Nain, L. K. Tyagi, S. R. K. Singh and Nishi Sharma who rigorously edited the papers to bring out the journal. I express my gratitude to the contributors for their quality research papers for this issue. I extend my special thanks to Dr. Tulsi Bhardwaj in shaping this issue of the journal.

J.P. Sharma
Chief Editor

Information Need Assessment for Empowering Rural Women Through Community Radio Programmes: A Study in Tarai Region of Uttarakhand

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ABSTRACT

The study was conducted to assess the information needs of rural women for developing Community Radio programmes. The paper focuses on information needs of rural women in the areas of social, economic and psychological empowerment. A sample of 1000 respondents was selected through Census method in Jawaharnagar, Shantipuri and Gokulnagar villages of Rudrapur Block in Udham Singh Nagar District of Uttarakhand. Data were collected through semi-structured interview schedule, observation and Focused Group Discussion. The collected data were analyzed through Frequency, Mean and Percentage. Findings reveal that rural women wanted information on the following topics through community radio programmes: Methods of purifying water, Weaning food [*Purak Aabar*], Immunization, Awareness of HIV/AIDS, Government Programmes in Uttarakhand, Government programmes for providing loan to micro enterprise, SHGs, Tips to avoid mental tension.

Keywords: Community Radio, Information needs, Rural women

INTRODUCTION

Information need is an individual or group's desire to locate and obtain information to satisfy a conscious or unconscious need. The "Information" and "Need" in "Information Need" are inseparable interconnection. Needs and interests can forth information. Information needs are related to, but distinct from information requirement. An example is that a need is hunger; the requirement is food (Singh and Mishra, 2012). Rural women are not only in need of information regarding agriculture and animal husbandry but they are interested in all kind of information which helps them in their development. To bridge the gap between the elite and the poor, it is necessary to put emphasis on information need fulfilling development messages.

Sharma and Kumar (2010) have mentioned that identification of information needs is essential to develop the community radio programmes for women empowerment and to the provision of effective information services in particular but it has been found to be a difficult task as it is almost an investigative task or detective work. In order to identify information

needs one should adopt various methods to gather information on various facts that influence the information needs. Need is generally defined as the gap between what one have and what one wanted to have for effective dissemination of any innovation. It is important that community radio programmes for rural women should be based on their needs. If the community radio programmes are based on their needs, it will be well received and adopted quickly. Dutta (2010) has reported that very less number of studies have been conducted on the information needs of rural women for community radio programmes. Taking this backdrop, the present study was conducted with the main objective to assess the information needs of rural women.

MATERIAL AND METHODS

The present study was carried out in Rudrapur Block of Udham Singh Nagar District of Uttarakhand state. The Udham Singh Nagar district consists of seven blocks viz., Bajpur, Gadarpur, Jaspur, Kashipur, Khatima, Rudrapur and Sitarganj. Rudrapur block is selected purposively because Community Radio Station

of G. B. Pantnagar University of Agriculture and Technology is situated in the Rudrapur block. A sample of 1000 rural women age group of 15-45 year was selected through Census method. Data was collected through semi-structured interview schedule, observation and focused group discussion. Prior interview respondents were taken into confidence by revealing the actual purpose of the study and full care was taken in to consideration and developed good rapport with them. The collected data was analyzed by the help of various statistical tools i.e. frequency, mean and percentage.

RESULTS AND DISCUSSION

Social Empowerment: Social Empowerment was divided into five main heads with subheads (1) Food and Nutrition (a) Balanced Diet (b) Essential Food to keep healthy (c) Daily Dietary Pattern (d) Food for Pregnant women (e) Effects of Mother diet on foetus (f) Method of cooking vegetables (g) Method of Purifying water (2) Child Development (a) Breast Feeding (b) Age of Weaning Food (c) Immunization (3) Sanitation and Hygiene (a) Disposal of Garbage (b) Effect of Hygiene on health (c) Control of Household Pest (4) Family Planning (a) Family Planning Methods (b) HIV/AIDS (5) Education (a) Girl Education (b) Value Education (5) Government Programmes (a) Government Programmes for welfare of women in Uttarakhand.

Food and Nutrition: Under this head rural women were asked if they were aware of Food and nutrition [(a) Balanced Diet (b) Essential Food to keep healthy (c) Daily Dietary Pattern (d) Food for Pregnant women (e) Effects of Mother diet on foetus (f) Method of cooking vegetables (g) Method of Purifying water] or not. It is evident from the table that out of total number of respondents, majority of them (79.2 per cent) reported that they were aware about balanced diet while remaining 20.8 per cent stated that they did not aware about balanced diet. More than half per cent of respondents (75.6 per cent) were aware of food essentials necessary in maintaining good health while 24.4 per cent respondents reported that they were unaware about food essentials necessary in maintaining good health. 75.2 per cent respondents were aware about the dietary pattern for pregnant women while remaining 24.8 per cent respondents stated that they did not know dietary pattern for pregnant women. Majority of respondents (89 per cent) were aware about the

Table 1: Information needs assessment regarding social empowerment of rural women (N=1000)

Category	Aware	Unaware
Social Empowerment		
Food and Nutrition		
Balanced Diet	792 (79.2)	208 (20.8)
Essential Food to keep healthy	756 (75.6)	244 (24.4)
Daily Dietary Pattern	650 (65.0)	350 (35.0)
Food for Pregnant women	752 (75.2)	248 (24.8)
Effects of Mother diet on fetus	890 (89.0)	110 (11.0)
Method of cooking vegetables	509 (50.9)	491 (49.1)
Method of Purifying water	192 (19.2)	808 (80.8)
Child Development		
Breast Feeding	978 (97.8)	22 (2.2)
Age of Weaning Food	185 (18.5)	815 (81.5)
Immunization	162 (16.2)	838 (83.8)
Sanitation and Hygiene		
Disposal of Garbage	933 (93.3)	67 (6.7)
Effect of Hygiene on health	975 (97.5)	25 (2.5)
Control of Household Pest	795 (79.5)	205 (20.5)
Family Planning		
Family Planning Methods	475 (47.5)	525 (52.5)
HIV/AIDS	190 (19.0)	810 (81.0)
Education		
Girl Education	839 (83.9)	161 (16.1)
Value Education	766 (76.6)	234 (23.4)
Educational Programmes (Sarve Siksha Abhiyan)	815 (81.5)	185 (18.5)
Government Programmes		
Government Programmes for welfare of women in Uttarakhand	171 (17.1)	829 (82.9)

Needs of the rural women were assessed in three main heads viz; social, economic and psychological empowerment.

effects of mother's diet of foetus while 11 per cent respondents were not aware about the effects of mother's diet of foetus. It was found that 50.9 per cent of the rural women know the right way of cooking green vegetable so that nutrient quality is not destroyed while 49.1 were unaware about the same. Majority of respondents (80.8 per cent) were unaware about methods of purifying water while less number of respondents (19.2 per cent) were aware about methods of purifying water.

Child development: This head included three components which are (a) Breast Feeding (b) Age of Weaning Food (c) Immunization. It is clearly visible from the above table that majority of respondents (97.8 per cent) were aware about breast feeding on the other hand 2.2 per cent respondents did not know about importance of breast feeding. Maximum of the

respondents (81.5 per cent) were unaware about the weaning food (Purak Aahar) and remaining 18.5 per cent of respondents were aware about the weaning food. Large number of respondents (83.8 per cent) were unaware about immunization while less number of respondents (16.2) did not know about immunization.

Sanitation and Hygiene: This head comprised of three components which were (a) Disposal of Garbage (b) Effect of Hygiene on health (c) Control of Household Pest. It is clearly visible from the table that majority of respondents (93.3 per cent) respondents were aware about the disposal of garbage while 6.7 per cent respondents were unaware the same. 97.5 per cent respondents were aware about the effects of hygiene on health while 2.5 per cent of respondents did not know the effects of hygiene on health. 79.5 per cent of respondents were aware about method of controlling household pests while 20.5 per cent of respondents were unaware about the same.

Family Planning: This head comprised of two components which were (a) Family Planning Methods (b) HIV/AIDS. It can be concluded from the table that one fourth respondents (47.5 per cent) were aware about the methods of family planning while 52.5 per cent of respondents were not aware about the family planning methods. Maximum number of respondents (81.0) were not aware about HIV/AIDS while 19 per cent respondents were aware about HIV/AIDS.

Education: This head comprised of three components which were (a) Girl Education (b) Value Education (3) Educational Programmes (Sarve Siksha Abhiyan). From table it is conclude majority of respondents (83.9 per cent) were aware about the importance of girl education while 16.1 per cent of respondents were unaware about the importance of girl education. 76.6 per cent of respondents were aware about the value education while 23.4 per cent respondents did not know about value education. Maximum number of respondents (81.5 per cent) were know about the educational programme (Sarve Shiksha Abhyian) and remaining 18.5 per cent respondents did not know the educational programme (Sarve Shiksha Abhyian).

Government Programmes in Uttarakhand: This head comprised of one component which was (a) Government Programmes for welfare of women in Uttarakhand. From the table it can be conclude that maximum number of respondents (82.9 per cent) were not aware about the Government programmes for

welfare of women in Uttarakhand and remaining 17.1 per cent of the respondents were aware about the same.

Economic Empowerment: Economic Empowerment was divided into four main heads with sub heads (1) Entrepreneurship (a) Income generating activities (2) Animal Husbandry (a) Animal Health Care (b) Animal Breeding and Disease (3) Agriculture (a) High yielding varieties (b) Fertilizers (4) Self Help Group and Rural Credit (a) Government schemes providing for microenterprise in Uttarakhand (b) Self Help Group.

Table 2: Information Need Assessment regarding economic empowerment of rural women

Category	Aware	Unaware
Economic Empowerment		
Entrepreneurship		
Income generating activities	774 (77.4)	226 (22.6)
Animal Husbandry		
Animal Health Care	316 (31.6)	684 (68.4)
Animal Breeding and Disease	299 (29.9)	701 (70.1)
Agriculture		
High yielding varieties	219 (21.9)	781 (78.1)
Fertilizers	220 (22.0)	780 (78.0)
Self Help Group and Rural Credit		
Government schemes providing for microenterprise in Uttarakhand	150 (15.0)	850 (85.0)
Self Help Group	197 (19.7)	803 (80.3)

Entrepreneurship: This head comprised of one component which was (a) Income generating activities. The data presented in table 16 depicts that 77.4 per cent of respondents were aware about income generating activities and remaining 22.6 per cent respondents were not aware about income generating activities.

Animal Husbandry: This head comprised of two components which were (a) Animal Health Care (b) Animal Breeding and Disease. It is clearly visible from the table that 68.4 per cent of respondents were not aware about animal health care, on the other hand one fifth of respondents (22.6 per cent) were aware about animal health care. 70.1 per cent of respondents were not aware about Animal Breeding and Disease while 29.9 per cent of respondents were aware about Animal Breeding and Disease.

Agriculture: This head comprised of two components which were (a) High yielding varieties (b) Fertilizers. It can be conclude from the table that 78.1 per cent of

respondents were not aware about high yielding varieties while 21.9 per cent of respondents were aware about high yielding varieties. 78 per cent of respondents were aware about fertilizers while 22 per cent respondents were unaware about fertilizers.

Microfinance: This head comprised of two components which were (a) Government schemes providing loan for microenterprise (b) Self Help Group. It can be conclude from the table that 85 per cent respondents were not aware about the government schemes providing loan for microenterprise while 15 per cent respondents were aware about the government schemes providing loan for microenterprise. Majority of respondents (80.3 per cent) were unaware about SHGs and remaining 19.7 per cent of respondents were aware about SHGs.

Table 3: Information Need Assessment regarding Psychological Empowerment of rural women

Category	Aware	Unaware
Psychological Empowerment		
Awareness about yoga and exercise	490(49.0)	510(51.0)
Awareness about tips to avoid mental tension	160(16.0)	840(84.0)

Psychological Empowerment:

Psychological empowerment: Psychological empowerment was divided into one main head with two sub heads: (1) Mental Fitness (a) Awareness about Yoga and Exercise (b) Awareness about tips to avoid mental Tension. The data presented in Table 3 depicts that 51 per cent respondents were unaware about Yoga and Exercise while 49 per cent of respondents were aware about Yoga and Exercise. 84 per cent respondents were not aware about the tips to avoid mental tension while very few respondents (16 per cent) were aware about the tips to avoid mental tension.

Need Prioritization: It refers to the existing level of gap between task performance and task requirement of the respondents with respect to their knowledge, skills, attitude and understanding in women empowerment aspects. The needs which received less than twenty per cent knowledge by the respondents were selected. This lead to the process of needs prioritization. This process of need prioritization should be carried out in consultation with the local people.

Table 4: Prioritization of information need on women empowerment aspects

Subject matter area	No. of respondents	Percentage
Social Empowerment		
Methods of purifying water	192	19.2
Weaning food [Purak Aahar]	185	18.5
Immunization	162	16.2
Awareness of HIV/AIDS	190	19.0
Government Programmes in Uttarakhand	171	17.1
Economic Empowerment		
Government programmes for providing loan to micro enterprise SHGs	150	15.0
	197	19.7
Psychological Empowerment		
Tips to avoid mental tension	199	19.9

Social Empowerment: Out of the seven components under Food and Nutrition head “Methods of purifying water” was found to be the component with minimum respondents (19.2 per cent) were aware. Thus, this component was selected from this head for community radio programme production. Out of the four components under Child development head, “Weaning Food” and “Immunization” were found to be the components with minimum percentage (18.5 per cent and 16.2 per cent) of respondents who were aware. Thus, these components were selected from this head for community radio programme production. Out of the three components under “Sanitation and Hygiene” head, majority of respondents were aware about the (a) Disposal of Garbage (93.3 per cent) (b) Effect of Hygiene on health (97.5 per cent) (c) Control of Household Pest (79.5 per cent). Thus no component was selected from this head for community radio programme production. Out of the two components under Family Planning head, “HIV/AIDS” was found to be the component with minimum percentage (19 per cent) of respondents were aware about this disease. Thus, this component was selected from this head for community radio programme production. Out of the three components under Education head, majority of respondents were aware about the (a) Girl Education (83.9 per cent) (b) Value Education (76.6 per cent) (3) Educational Programmes (Sarve Siksha Abhiyan) (81.5 per cent). Thus no component was selected from this head for community radio programme production.

Under Government Programmes in Uttarakhand head, “Government Programmes for welfare of women in

Uttarakhand” was found to be the component with minimum percentage (17.1 per cent) of the respondents were aware about this issue. Thus this component was selected from this head for community radio programme production.

Economic Empowerment: Under Entrepreneurship head majority of respondents were aware about the Income generating activities (77.4 per cent). Thus, this component was not selected for community radio programme production. Under Animal Husbandry head more than 20 per cent of respondents were aware about (a) Animal Health Care (31.6 per cent) (b) Animal Breeding and Disease (29.9 per cent). Thus, these components were not selected for community radio programme production. Out of the two components under Agriculture head more than 20 per cent of respondents were aware about (a) High yielding varieties (21.9 per cent) (b) Fertilizers (22 per cent). Thus, these components were not selected for community radio programme production. Out of the two components under Microfinance head, “Government schemes providing loan for microenterprise in Uttarakhand” and “Self Help Group” were found to be the components with minimum percentage (15 per cent, 19.7 per cent) of respondents were aware about these issues as compared to other components. Thus, these components were selected for community radio programme production.

Psychological Empowerment: Out of the two components under Mental fitness head, “Awareness about tips to avoid mental Tension” was found to be the component with minimum percentage (19.9 per cent) of respondents were aware about this issue. Thus, this component was selected for community radio programme production.

CONCLUSION

Information need assessments of audience become

important in context of development of community radio programmes for women empowerment. Researchers have revealed that need assessment is essential for the effectiveness of the media. Community Radio being a community media for developmental purpose need special emphasis on listeners profile and need assessment. On the whole, it can be concluded that the rural women want information on these eight topics viz; Methods of purifying water, Weaning food (Purak Aahar) Immunization, Awareness of HIV/AIDS, Government Programmes in Uttarakhand, Government programmes for providing loan to micro enterprise, SHGs, Tips to avoid mental tension. The findings of the present study have a great potential in the field of communication research as well as for planning and dissemination of need based information among rural women. The needs of rural women are identified in three areas of empowerment. Community radio managers should design, develop and disseminate information through community radio programmes to empower the rural women. Therefore it seem apparent and essential that the need assessment of the listeners emerge as a critical component to be analyzed before conceptualizing the community Radio programmes for enhance effectiveness according to the community Radio objectives.

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Land Utilization Pattern of Recommended Rice Production Technologies According to Various Soil Types in Chhattisgarh State

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ABSTRACT

According to depth and topography, the Chhattisgarh (CG) state is having various topographic situations with land types. On higher elevation, the topography of soil situation called *Bhata* (entisols), lower to this *Matasi* (inceptisols), then *Dorsa* (alfisols), and at lowest elevation and highest deep *Kanbar* (vertisols) were widely situated. Out of the total geographical area of CG (1.35 lakh sq.m) occupied 4.14% area of country, the area of *Bhata*, *Matasi*, *Dorsa* and *Kanbar* occupied 9.8, 14, 10.8 and 11.2 lakh ha area respectively. The present investigation was carried out with a sample of 120 farmers selected from 12 villages from 3 randomly selected blocks of Raipur District. The findings showed that inceptisols and vertisols were the popular soil types among the respondents. The findings revealed that majority of the respondents were adopting broadcast method for sowing in all types of soils. This study showed 1010 variety of rice were used in maximum and using medium fertilizers application according to soil textures, used effective pesticides and control measures. Regarding knowledge about land types, most of the farmers were found to be well aware about soil characteristics and continued the adoption of recommended practices, variety, sowing method but at average level.

Keywords: Soil Types, Rice, Raipur, India

INTRODUCTION

Soil is a thin layer of earth's crust-serves natural medium for growth of plants. It contains mixture of fine rock particles and decomposed organic matter of vegetation and animals. Soil is a precious gift of nature, human beings achieved great success by learning the use of the soil. Food, cloth and shelter are three basic needs of human beings. All these needs directly or indirectly fulfilled by soil. Soil is not only the basis of agriculture but also helps in better production. India is a large country. The diversities in rock reliefs, climate and vegetations are found here, as a result of these diversities different types of soil are found in India. The total geographical area of Chhattisgarh is 1.35 lakh sq. km. occupied 4.14% area of the country. The total agricultural land of Chhattisgarh is about 58 lakh ha with less than 30% irrigated area. Whereas, the total area of agricultural land of Raipur district is 5.5 lakh ha with about 42% irrigated area. In Chhattisgarh according to depth and topography, the soils are mainly classified as

Bhata (Entisols), *Matasi* (Inceptisols), *Dorsa* (Alfisols) and *Kanbar* (Vertisols). On higher elevation the topography of soil situation called *Bhata*, lower to this *Matasi*, then *Dorsa* and at lowest elevation and highest deep *Kanbar* soils are widely distributed. In Chhattisgarh, *Bhata* soils comprises 9.8 lakh ha, *Matasi* soils 14 lakh ha, *Dorsa* soils 10.8 lakh ha and *Kanbar* soils occupied 11.2 lakh ha area. The predominant reason for non-adoption or partial adoption of agricultural technologies according to soil types are the lack of awareness, small and scattered land holdings, illiteracy, poor resource status of farmers. The study was conducted with the objectives to find out the adoption and knowledge level of farmers of Raipur district of C.G.

MATERIAL AND METHODS

The study was conducted in Raipur District of Chhattisgarh state which is comprised at sixteen districts, out of these, only Raipur district was selected purposively. Out of fifteen blocks, three blocks namely

Abhanpur, Arang and Dharsiwa were purposively selected for this study because it has the largest area under rice cultivation in comparison to other blocks in the district and it is nearer to Indira Gandhi Agricultural University, Raipur and is easily approachable. Out of the total villages of Arang, Abhanpur and Dharsiwa blocks, four villages from each block were selected purposively. Thus the total 12 villages from three blocks were selected. Out of the total farm families of each selected village, 10 farmers were selected on the basis of soil types. Thus, the total 40 rice growers were selected from each blocks. In this way a total 120 farmers were finally considered in the sample for the collection of data and interviewed by the investigator with the help of structured interview schedule.

RESULTS AND DISCUSSION

The data in Table 1 show that *kanbar* and *matasi* soil were occupied by majority of the respondents, but most of them were having only 1.1 to 5 acre. About 22, 9 and 1.20 per cent respondents had below 1, 5.1 to 10 and above 10 acre area of *kanbar* soil, respectively. Among the farmers having *matasi* type of soil, majority of them (66.6%) were having 1.1 to 5 acre. The other owners of *matasi* soils were occupied relatively less acreage. Only 16 per cent age of respondents had more than 5 acres of land holding. In case of *dorsa* type of soil, majority of the occupant farmers were having below 1 acre area, while 29.03 per cent were having 1.1 to 2.5 acre. Whereas, 19.36 and 16.13 per cent respondents were having 2.6 to 5 and 5.1 to 10 acre area of *dorsa* soil, respectively. Though the *bhata* type of soil are rare but majority of the farmers having *bhata* soils had less than 1 acre of area.

The data presented in Table 2 show the popular method of rice sowing as well as the area covered. In *bhata* soil majority of the respondents (75%) were using *biasi* method of rice sowing and remaining 25.00 per cent respondents were using line sowing method. In *matasi* soils majority of the respondents (67.79%) were also using broadcast *biasi* method of rice sowing. While 16.95 per cent were using line sowing, and 8.48 and 6.78 per cent respondents were using *keburra* and transplanting method for sowing of rice crop, respectively in *matasi* soils. Majority of the respondents (52.18%) were also using broadcast *biasi* method for sowing of rice crop in *dorsa* soils. About 59 per cent respondent were using broad casting method for sowing of rice in *kanbar* type of soil, while, 23.46, 9.88 and 7.40 per cent respondents

Table 1: Distribution of respondents according to their area of soil types (n=120)

Area	Frequency	Percent
Bhata		
Below 1.0 acre	4	50
1.1-2.5 acre	2	25
2.6-5.0 acre	2	25
5.1-10.0 acre	0	0
Total	8	100
Matasi		
Below 1.0 acre	14	17.28
1.1-2.5 acre	28	34.56
2.6-5.0 acre	26	32.10
5.1-10.0 acre	9	11.12
Above 10.1 acre	4	4.94
Total	81	100
Dorsa		
Below 1.0 acre	11	35.48
1.1-2.5 acre	9	29.03
2.6-5.0 acre	6	19.36
5.1-10.0 acre	5	16.13
Above 10.1 acre	0	0
Total	31	100
Kanbar		
Below 1.0 acre	18	21.69
1.1-2.5 acre	29	34.93
2.6-5.0 acre	27	32.54
5.1-10.0 acre	8	9.64
Above 10.1 acre	1	1.20
Total	83	100

were using line sowing, transplanting and *keburra* methods for sowing in *kanbar* type of soils, respectively. Regarding area, it was found that most of the rice area viz 86.67, 49.85, 46.15 and 59.77 per cent is being cultivated by broad casting method of sowing in *bhata*, *matasi*, *dorsa* and *kanbar* type of soils, respectively.

The Table 3 refers about the acreage under the different rice varieties according to various soil types. Regarding *bhata* soil, majority of the respondents 62.50 per cent were using Poornima variety, while 25.00 per cent respondents were using 1010 variety. Whereas, 12.50 per cent each respondents were using Mahamaya, others and IR 36/ IR 64 varieties of paddy crop respectively in their field. In case of *matasi* soil, majority of the respondents (58.02 per cent) were using 1010 variety. While, 24.96 and 23.46 per cent respondents were using Mahamaya and 1001 variety of paddy respectively. Whereas, 13.58, 11.11, 8.64, 4.93 and 4.93 per cent respondents were adopt IR 36/IR64, others, Swarna, Safari and HMT varieties of paddy, respectively.

Table 2: Sowing methods of rice adopted by the respondents according to soil type

Sowing method of rice crop	Bhata(n=8)		Matasi(n=81)		Dorsa(n=31)		Kanhar(n=83)	
	Respondent	Area	Respondent	Area	Respondent	Area	Respondent	Area
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Broad casting/Biasi	75.00	86.67	67.79	49.85	52.38	46.15	59.26	59.77
Line sowing	25.00	13.33	16.95	21.58	21.43	26.92	23.46	20.69
Transplanting	0.00	0.00	6.78	11.43	16.67	15.38	9.88	11.49
Khurra	0.00	0.00	8.48	17.14	9.52	11.59	7.40	8.05

Table 3: Percentage distribution of respondents and area according to rice varieties

Varieties	Bhata		Matasi		Dorsa		Kanhar	
	Respondent (%)	Area (%)	Respondent (%)	Area (%)	Respondent (%)	Area (%)	Respondent (%)	Area (%)
Swarna	00.00	00.00	8.64	8.71	16.13	7.69	32.53	17.48
Safri	00.00	00.00	4.93	5.43	6.45	4.54	15.66	10.67
Mahamaya	12.50	13.00	24.69	21.12	22.58	20.08	14.45	4.83
MTU1010	25.00	26.70	58.02	36.25	64.52	42.31	50.60	26.79
MTU 1001	00.00	00.00	23.46	6.90	25.81	8.46	16.86	10.39
HMT	00.00	00.00	4.93	3.11	19.35	6.41	25.30	11.26
IR-36/ IR-64	12.50	9.30	13.58	11.21	3.22	3.11	00.00	00.00
Poornima	62.50	41.00	00.00	00.00	3.22	3.11	00.00	00.00
Others	12.50	10.00	11.11	7.27	6.45	5.10	16.86	9.10

Regarding *dorsa* soil, majority of the respondents 64.52 per cent were using 1010 variety. While 22.58 per cent respondents were using Mahamaya variety, 25.81, 19.35, 16.13, 6.45, 6.45, 3.22 and 3.22 per cent respondents were using 1001, HMT, Swarna, Others, Safari, IR 36/ IR 64 and Poornima varieties of paddy in their field, respectively. In respect of kanhar soil, majority of the respondents 50.60 per cent were using 1010 variety.

The data presented in Table 4 reveal that majority of the respondents adopted nitrogen below 50 kg/ha in *bhata*, *matasi*, and *dorsa* soils. In kanhar soil maximum (34.57%) respondents were applying 61 to 70 kg/ha nitrogen. With regards to application of phosphorus in rice farming it was found that most of the respondents were applying less than 40 kg/ha phosphorus in all types of soils. Similarly, majority of the respondents were using less than 25 kg/ha potash in all types of soils for the cultivation of rice crop. The percentage of farmers using adequate dose of NPK fertilizer in rice crop was found very less in all type of soils however kanhar soils got quite more fertilizers than other soils type.

The data according to Table 5 refers majority of

the respondents were affected by stem borer in their field in all types of soil. Paddy blast was the main disease of paddy crop after this wilt, brown spot, loose smut, blight and false smut were also found to affect the crop in large scale. Pest control measure were being done by respondents and majority of them sprayed the malathian and monocrotophas as insecticides in their field after this various insecticides were used like Novacron, Diathen-M-45, Demacron and Diathen-Z- 78.

The findings mentioned in Table 6 reveal that majority of the respondents were having 95.90 per cent knowledge about importance of *matasi* soil which was also reported by Dubey and Sawarkar (1992).

Also majority of the respondents were having maximum 78.19 per cent knowledge about water holding capacity of *kanhar* soil. Maximum (83.33%) knowledge about soil structure of *bhata* soil were known to the majority of the respondents. Majority of the respondents were having 70.97 per cent knowledge about soil topography of *dorsa* soil. Majority of the respondents were having 70.79 and 81.48 per cent knowledge about soil depth and soil productivity of *kanhar* soils, respectively. Among , all the traits of soils

Table 4: Distribution of respondents according to their recommended dose of fertilizer

Fertilizers (kg/ha)	Bhata		Matasi		Dorsa		Kanhar	
	F	%	F	%	F	%	F	%
Nitrogen								
Below 50	3	37.5	38	45.78	13	41.93	24	29.63
51-60	2	25.0	23	27.72	8	25.82	11	13.58
61-70	2	25.0	13	15.66	6	19.35	28	34.57
Above 70	1	12.5	9	10.84	4	12.90	18	22.22
Average		58.6		62.6		63.1		69.7
Phosphorus								
Below 30	2	25.0	28	33.73	9	29.03	21	25.92
31-40	3	37.5	39	46.99	15	48.39	17	20.39
41-50	2	25.0	11	13.26	4	12.90	19	23.46
Above 50	1	12.5	5	6.02	3	9.68	24	29.63
Average		37.8		40.2		40.7		48.3
Potash								
Below 20	4	50.0	43	51.81	8	25.81	23	28.39
21-25	2	25.0	25	30.12	14	45.16	28	34.58
26-30	1	12.5	12	14.46	6	19.35	21	25.92
Above 30	1	12.5	3	3.61	3	9.68	9	11.11
Average		21.1		24.4		26.9		28.8

Table 5: Major insect-pest and diseases of rice crop and their management as reported by the respondents

Pest	Bhata		Matasi		Dorsa		Kanhar	
	F	%	F	%	F	%	F	%
Insect Pest								
Stem-borer	7	87.50	80	96.38	29	93.55	78	96.29
Brown plant hopper	4	50.00	73	87.95	26	83.87	73	90.12
Gandhi bug	5	62.50	58	69.88	19	61.29	60	74.00
Grass hopper	6	75.00	69	83.13	28	90.32	79	97.53
Green leaf hopper	5	62.50	74	89.16	23	74.19	62	76.54
Leaf worm	4	50.00	61	73.49	18	58.06	54	66.67
Disease								
Paddy blast	6	75.00	78	93.97	30	96.77	78	96.29
Wilt	5	62.50	70	84.34	21	67.74	52	64.19
Brown spot	6	75.00	64	77.11	27	87.09	64	79.01
Loose smut	7	87.50	62	74.69	23	74.19	68	83.95
Blight	5	62.50	69	83.13	29	63.54	60	74.07
False smut	4	50.00	58	69.88	18	58.06	63	77.78
Chemical used								
Malathian	2	25.00	21	25.30	7	22.58	24	29.63
Monocrotophas	2	25.00	16	19.28	6	19.36	13	16.05
Novacron	1	12.50	13	15.66	4	12.90	4	4.94
Diathen-M-45	1	12.50	10	12.05	3	9.68	15	18.52
Demacron	0	0.00	6	7.23	2	6.45	7	8.64
Diathem-Z-78	2	25.00	17	20.48	9	29.03	18	22.22

Table 6: Distribution of respondents according to their Knowledge about various soil types (N=120)

Agriculture particulars	Bhata (%)	Matasi (%)	Dorsa (%)	Kanhar (%)
Importance	75.00	95.90	78.49	82.30
Water holding capacity	70.83	70.28	62.36	78.19
Soil structure	83.33	66.26	64.52	67.49
Soil topography	66.67	67.47	70.97	69.13
Soil depth	66.67	65.06	66.67	70.79
Productivity	79.17	70.28	74.19	81.48

Table 7: Adoption of rice technology according to various soil types

Recommended practices	Bhata (N=8)			Matasi (N=81)			Dorsa (N=31)			Kanhar (N=83)		
	Low (<33%)	Medium (34-66%)	High (>66%)	Low (<33%)	Medium (34-66%)	High (>66%)	Low (<33%)	Medium (34-66%)	High (>66%)	Low (<33%)	Medium (34-66%)	High (>66%)
Variety	6	2	0	42	27	14	13	8	10	12	19	50
Sowing method	2	3	3	7	45	31	5	11	15	21	28	32
Nitrogen	4	3	1	19	51	13	14	7	10	12	53	16
Phosphorus	5	1	2	38	21	24	12	8	11	31	34	16
Potash	6	1	1	58	22	3	21	8	2	52	24	5
Pest management	3	2	3	36	26	21	14	9	8	19	24	38
Disease management	2	4	2	28	33	22	16	6	9	19	35	27

being in interrogated by the farmers, the level of knowledge about all soil types was found fairly high. The data compile in Table 7 refers about the adoption of recommended technology of rice in various soil types, in respect to variety, majority of the respondents were growing recommended varieties in *kanhar* soils. According to sowing method, majority of the respondents were adopted the recommendation at medium level in *matasi* soil. Recommended dose of nitrogen and phosphorus were adopted by the maximum respondents in *matasi* and *kanhar* soils. The recommended dose of potash were adopted at medium level in *matasi* and *kanhar* soil by Singh (1993). Modern pest management practices were also adopted in *kanhar* and *matasi* soils at a high level. Recommended disease management were also highly adopted in *matasi*, medium adopted in *kanhar* and poorly adopted in *dorsa* soils.

CONCLUSION

In this research the major conclusion is that the respondents were not used recommended practices as compared to eligible criteria according to various soil types. They adopt the all practices of rice crop in short terms and after the trial on small scale. They used various technologies after some profitable discussion and suggestions.

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Participation of Farm Women in Livestock Management in Auraiya District of Uttar Pradesh

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ABSTRACT

India occupies the foremost position in the world in respect to livestock contributing nearly about one fourth of the world total bovine population and women are the critical partner in livestock management. Involvement of women in livestock management is tradition in India, where domestic animals have been an integral part of the family system. Although most of the works related to dairy farming is carried out by the women, their contribution is being ignored. Hence, the study on analysis of different roles performed by the rural women and the factors affecting them are of paramount importance to the planners and decision makers, Government and extension workers involved in the process of rural development. Keeping this fact in view, the present study was undertaken in Auraiya district of Uttar Pradesh with specific objectives to document the participation of women in livestock management. The frequency of involvement of farm women was found in highest in watering and feeding of animal followed by cleaning the cattle shed, cutting and bringing of fodder and compost making and so on. The relationship between the selected variables of the respondent and their involvement in livestock management was found negative for all of the independent variables except type of family. Sale of milk and its product was dominantly decided by farm women followed by keeping herd size, whereas selection of feed and fodder and selection of animal breeds were taken jointly by family member.

Keywords: Livestock management, Farm women, Participation

INTRODUCTION

Women play a major role in shaping the country's economy through their active population in agriculture and allied sector. The census data of 2001 reject the fact that out of the total 496 million of rural population 23.9% male worker and about 87% female workers are found in agriculture. India is predominantly an agrarian society where animal husbandry is the core activity and which forms the backbone of national economy and the farm women are the pillars of the Indian agriculture and the animal husbandry enterprises are completely dependent on them. Animal husbandry is an allied activity of agriculture and thus it forms an integral part of the rural economy. It is a potential employment creating avenue and adding to the additional income of the rural poor particularly small and marginal farmers as well as agricultural laborers. Therefore, a livestock enterprise has provided a strong support to Indian farmer. India is endowed with the largest livestock population in the world with 55% buffalo's & 16% of cattle population. Although most of the world related

to dairy farming is carried out by the women, their role has been ignored (Khandari & Rakma, 2004). Hence the study on analysis of different roles performed by the rural women and the factors affecting them are of paramount importance to the planners, decision makers, extension workers & Government involved in the process of rural development. Keeping this fact in view, the present study was conducted in Auraiya district of Uttar Pradesh with the specific objectives to analyze the role performed by rural women in livestock management, to examine the relationship with the socio personal variable & the role performed by the rural women in livestock management and also to study the involvement of the rural women in decision making related to the livestock management.

MATERIAL AND METHODS

The present study was conducted in Bhagyanagar and Achhalda Blocks of Auraiya district of the Uttar Pradesh, which is one of the rural dominated districts of the state. Six villages viz. Bahadurpur, Makhampur,

Aruchi Ka Purwa, Mudhi, Parwaha & Haziapur from Bhaganagar block and Six village viz. Kachapura, Uzene Ka Purwa, Pata, Hamirpur, Purwa Bharamal & Harchandpur from Acchalda Block were selected randomly for the study. Thus, total 12 villages were selected. Ten (10) farm women were selected randomly from each of the selected village. Thus the total sample size was confined to 120 farm women. Ex-post facto research designed was employed to conduct the study. Data were collected through personal interview schedule. The mean was obtained by the total number of score divided by total number of respondents. Correlation coefficient was computed to find out the relationship between each of the selected variable and the role performance of farm women.

RESULTS AND DISCUSSION

The results of the present study as well as relevant discussion have been summarized under following heads:

Participation of farm women in livestock management: Perusal of Table 1 clearly reveals the involvement of farm women in livestock management. The highest means score of involvement of farm women was obtained in case of watering and feeding of animal i.e. 3.65 followed by cleaning the cattle shed (3.64), cutting and bringing the fodder (3.61) and bathing animals (3.44). The minimum involvement were found in taking the animals for veterinary service i.e. 0.12. The same result also reported by Firdous *et al.* (2002).

Participation of farm women in the process of decision making: A cursory look at the data in Table 2 regarding their involvement in decision making for livestock management practices showed that the sale of milk and milk product was dominantly decided by farm women (73.33%) followed by keeping size of herd (40.00%). The decision regarding selection of feed and

Table 1: Distribution of farm women according to their participation in livestock management

Livestock management practices	Mean value	Rank
Cutting and bringing the fodder	3.61	III
Watering and feeding of animals	3.65	I
Cleaning the cattle shed	3.64	II
Bathing animals	3.44	V
Compost making	3.22	VI
Milking	3.46	IV
Grazing	1.65	VIII
Selling of milk & its products	2.68	VII
Taking the animals for veterinary service	0.12	IX

fodder (51.67%), selection of animal breed (46.67%) and sale & purchase of animals (37.50%) were taken jointly by family members. The similar result are also found by Beck and Swanson (2003).

Relational analysis: Data presented in Table 3 reflect that the age of the respondent was observed negative yet significantly associated with women's involvement in livestock management. The result indicated that with increasing the age of the farm women their involvement in livestock management was decreasing. Whereas the education of the farm women was negatively and significantly associated with their involvement in livestock management. It shows that the educated farm women had poor interest in livestock management and related activities such as feeding; care and management of animals are perceived to be time consuming laborious jobs. Farther, their was negative relationship between occupation of farm women and their involvement in livestock management practices. The same result was reported by Khandari and Rukma (2004). It was concluded that their was significant negative relationship between occupation and their involvement in livestock management practices. A perusal of the data presented in the table indicated that there was negative significant

Table 2: Participation of farm women in the process of decision making in livestock management practices

Animal Husbandry	Only self		Husband		Along with family		Not related	
	No	%	No	%	No.	%	No.	%
Selection of feed & fodder	28	23.33	23	19.17	62	51.67	07	5.83
Selection of animal breeds	39	30.25	13	10.93	65	46.67	12	10.00
Sale & purchase of animals	42	35.00	15	12.50	45	37.50	18	15.00
Sale of milk & its products	88	73.33	12	10.00	16	10.33	04	3.33
Keeping size of herd	48	40.00	15	12.50	42	35.00	15	12.50

Table 3: Relation between the selected variables of the respondent and their contribution in livestock management practices

Variables	Correlation coefficient
Personal Variables	
Age	-0.8709
Education	-0.8868
Economic Variables	
Occupation	-0.6015
Land holding	-0.8882
Social Variables	
Family size	-0.9332
Type of family	+0.8646

relationship between land holding possessed by farm women and their involvement in livestock management. The results are similar with those reported by Mrinali *et al.* (2004). It is obvious that the farm women with large land holding was more engaged in various agricultural operation and they had less time available for livestock management. It is concluded that the farm women having large land holding was less involved in livestock management. There was negative significant relationship of family size with the participation of farm women in livestock management. It was observed that the farm women with large family size were more engaged in house hold activities any they could devote less time in livestock management. A cursory looks at the data in this table show that there was positive significant relation between type of family of farm women & their participation in livestock management. It means that the less involvement of farm women in livestock management was seen higher in case of joint family and less in case of nuclear family.

CONCLUSION

The frequency of involvement of farm women was found highest in watering and feeding of animal followed by cleaning the cattle shed and cutting and bringing the fodder, milking, compost making and other activities. The relationship between the selected variables of the respondent and their involvement in livestock management was found negative for all of the variables except type of family. Sale of milk and its product was dominantly decided by farm women followed by keeping heard size, where as selection of feed & fodder and selection of animal breed were taken jointly by family member.

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Information Dynamics for Designing Cyber Extension Model for Agricultural Development

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ABSTRACT

Need for developing effective mechanism for communication of farm information and dissemination of technology to the farmers was identified and in this regard, the cyber extension model was envisaged. The study aimed at designing and validating cyber extension model to disseminate technology information to the farmers for solving farm problems and augmenting overall agricultural development. In the first phase of the project the information input, process and output behaviour of the farmers was studied and the information needs of the farmers were identified and prioritised so that the contents of the proposed agri-portal can be suitably developed, which can be used in the subsequent phases. A survey among 60 farmers of villages under Sidhauri block of Sitapur district of Uttar Pradesh revealed that major sources of farm information were progressive farmers (53.3%) and input dealers (41.6%). Radio and Television were also used by 31.6 per cent and 21.6 per cent farmers, respectively. The investigation further revealed that a high percentage of farmers were the owners of modern Information and Communication Technologies. Radio was owned by 91.6 per cent farmers, while 81.6 per cent farmers had mobile phones. However, only 3.3 per cent of farmers owned computers. The awareness of respondents about improved technologies was found to be poor. Market related information was mostly accessed through input dealer (65%) followed by radio (60%) and progressive farmers (50%). Progressive farmers were also preferred for information about improved variety (68.3%) and crop production and crop protection technologies. It was observed that farmers were willing to pay for quality information, which could lead to substantial economic return.

Keywords: Information dynamics, Cyber extension, Agricultural development

INTRODUCTION

Access to the appropriate information for the agriculture and rural development becomes difficult task for the farmers in India. Due to inadequate scientific farm information delivery to the farmers, agriculture exhibits low productivity. Disappointing scientific information dissemination makes the farming become less remunerative and also creates food insecurity problem. Further, the upliftment of rural economy mainly relies on the agricultural production. To increase the farm production, the farmers need to be informed on recent scientific farm innovations. Farm information and technology dissemination to the farmers provide opportunities for their self-development, improve existing knowledge, skills and enhance their capability. Majority of the rural farmers are not having access to most of the required agricultural information (Meitei

and Devi, 2009). In this connection, ICTs hold lot of promise to deliver agricultural knowledge to the farmers. Knowledge and information are basic ingredients of food security and are essentials for facilitating rural development and bringing out social and economic change. Blaikie *et al.* (1997) emphasized on knowledge empowerment of rural people, which ultimately enhances decision making ability. Modern communication technologies, when systematically applied and adapted to conditions of rural areas of developing countries, can be used for rural communication to increase participation, disseminate information, share knowledge and skills. Local organizations and groups capable of acting on rural and agricultural development plans require new skills and knowledge to make informed choices about communication for development approaches and media

choices. Capacity building and institutional strengthening for intermediary organizations that serve rural and agricultural development is necessary so that they can make the most appropriate and creative use of traditional media and new ICTs (Michiels and Vann Crowder, 2001; Richardson, 1997).

In order to provide agricultural extension services through Information and Communication Technologies (ICTs), it is necessary to assess the information needs of the farmers so as to prepare and deliver specific messages or technologies as per the farmers' requirements (Sarvanan *et al.*, 2009). The rural populaces by and large, are resorting to the relatively advanced medium of communication like mobile phone, etc. In the changing scenario, a need has been felt analyse the information input, process and output pattern of the farmers so that matching content can be developed for effective dissemination of farm technology information. Keeping this in view, the present study was carried out to undertake a system analysis of agro-information input, process and output behaviour of the farmers.

MATERIAL AND METHODS

The study was carried out in Sitapur district of Uttar Pradesh. Two village clusters comprising five villages in each were selected randomly for the study. Thirty farmers from every five villages (i.e. 150) were sampled for data collection on the variables viz., agro-information input, process and output behaviour of the farmers. The information needs were also assessed and prioritized. Information Input was defined as an entrance or changes which is inserted into a system and activate/modify a process. Information input was studied in terms of frequency and extent of use as well as the purpose served by each source. Process was defined as the act of taking something through an established and usually routine set of procedures to convert it from one form to another, as a manufacturing or administrative procedure. Operationally it was defined as information access process, which was measured in terms of accessibility and type of information available. Output can be defined as an exit or changes which exit a system and activate/modify a process or simply outcome of any process. Operationally output is defined as quality and utility of information, which was measured in terms of effectiveness and usefulness of the information. Data was collected by using structured interview schedule, focused group discussion and in-depth interview.

Collected data were analyzed descriptive statistics like percentages and average.

RESULT AND DISCUSSION

Findings contained in the Table 1 revealed that major sources of farm information were progressive farmers (53.3%) and input dealers (41.6%). Radio and Television were also used by 31.6 per cent and 21.6 per cent farmers, respectively. The development officials like village level workers, block level officers, were found negligibly contacted for seeking farm related information.

Table 1: Sources of farm information (N=150)

Sources	Percentage of farmers using
Radio	31.6
Television	21.6
Mobile	-
Internet	-
Village level worker	03.3
Block level officer	-
Krishi vigyan kendra	21.6
Non-governmental organisation/voluntary organisation	14.0
Farmers' organisation/farmers'	08.3
Interest groups	
Friends/neighbours	30.0
Progressive farmers	53.3
Input dealer	41.6
Study tour	08.3

The investigation further revealed that a high percentage of farmers were the owners of modern Information and Communication Technologies. Radio was owned by 91.6 per cent farmers, while 81.6 per cent farmers had mobile phones. However, only 3.3 per cent of farmers owned computers. The awareness of respondents about improved farm technologies was found to be poor. Only 36 per cent farmers had heard about improved varieties of different crops of IARI. The percentage of farmers who had awareness about IPM, drip Irrigation, bio-fertiliser and bio-pesticides was 26.6, 33.3, 41.6 and 38.3, respectively. With regard to mass media usage for seeking farm information it was found that 76.7 percentage of the farmers listened to radio everyday for farm information while only 30 per cent of farmers read newspaper daily (Table 2). Television and newspapers were used twice in a week for seeking information by 61.7 and 56.7 per cent of

Table 2: Mass media usage frequency for seeking farm information (N=150)

Information source	Percentage of farmers				
	Everyday	Twice in a week	Once in a week	Fortnightly	Monthly
Radio	76.7	16.7	06.6	—	—
Television	08.3	61.7	16.7	13.3	—
Newspaper	30.0	56.7	08.3	03.3	01.7
Internet	—	—	—	—	48.3
Farm magazine	—	—	03.3	10.0	28.3
Extension literature	—	—	—	20.0	61.7
Mobile	05.0	—	—	—	—

farmers, respectively. Internet services were accessed once or twice in a year by the farmers mainly for seeing the results of board examinations. In case of mobile, some service providers sent short message service consisting of price of agricultural commodities in local markets, which was used by five per cent of farmers.

It was found that farmers preferred certain sources for accessing specific information. Radio was more preferred for information about production and protection technologies and market information. The market related information was mostly accessed through input dealers (65%) followed by radio (60%) and progressive farmers (50%). The progressive farmers were also preferred information source for improved variety (68.3%) and crop production and crop protection technologies. The KVK scientists were contacted for information related to improved varieties and availability of quality seed. It was observed that farmers were willing to pay for quality information which could lead to substantial economic returns. It was observed that majority of the farmers were willing to pay for information about market price (91.6%) followed by information about weather information (76.6%).

The study also revealed that the information sources such as radio, progressive farmers, extension literature, Krishi Vigyan Kendra and newspaper were perceived to be relatively more accurate compared to other sources such as friends/neighbours, input dealers, television and village level worker. The information provided by the progressive farmers, radio and friends/neighbours were considered relatively more 'timely' compared to the information provided by the sources like Village Level Worker, Farm magazine and Extension Literature (Table 3).

An assessment of quality of information provided by different sources revealed that sources such as

Table 3: Perceived accuracy and timeliness of information (N=150)

Information sources	Perceived accuracy (%)	Perceived timeliness (%)
Friends/neighbours	46.6	70.0
Progressive farmers	63.3	73.3
Village level worker	35.0	20.0
Krishi vigyan kendra	58.3	41.6
Input dealers	41.6	61.6
Radio	65.0	70.0
Television	48.3	46.6
Newspaper	28.3	31.6
Farm magazine	41.6	20.0
Extension literature	61.6	18.3

progressive farmers, radio, Krishi Vigyan Kendra and extension literature were perceived to have relatively higher quality (mean score ranging from 2.60–3.82) than compared to sources such as farm magazine, newspaper, television, village level worker and input dealers (Table 4). The progressive farmers could be critical in information dissemination in the proposed cyber extension model.

An investigation to the information need of the farmers revealed that most of the farmers (above 90%) needed farm information related to areas such as pest and disease management, improved crop varieties, availability of quality seed and market price (Table 5). Further, farm information were also needed by large number of farmers (about 61.6% to 76.7% farmer) in areas related to weather forecasting at local level, disease management in livestock, availability of inputs and availability of quality planting material. The other areas in which farmers needed information were related to rejuvenation of orchards, insect pest management in mango and farm credit/subsidy schemes or crop

Table 4: Ranking of Information Sources with respect to perceived quality (N=150)

Sources of information	Perceived quality	
	Mean score*	Rank
Friends/Neighbours	2.18	V
Progressive farmers	3.82	I
Village Level Worker	2.10	VII
Krishi Vigyan Kendra	2.60	III
Input dealers	2.37	IV
Radio	2.67	II
Television	2.15	VI
Newspaper	1.77	VIII
Farm magazine	1.60	IX
Extension literature	2.60	III

*Maximum score – 5, Minimum Score – 1

Table 5: Information need of farmers (N= 150)

Information need areas	Percentage of farmers	Rank
Pest and disease management	93.3	I
Improved crop varieties	90.0	II
Availability of quality seed	90.0	III
Market price	83.3	IV
Weather forecasting at local level	76.7	V
Disease management in livestock (HS, FMD)	75.0	VI
Availability of inputs (Fertilizer)	68.3	VII
Availability of quality planting material	61.6	VIII
Rejuvenation of orchards	48.3	IX
Insect pest damage in mango	41.7	X
Farm credit/subsidy schemes/ crop insurance	38.3	XI
Post harvest management and value addition of fruits, vegetables	19.0	XII

insurance. It can be noted that only 19 per cent of the farmers needed information about post harvest management and value addition of fruits and vegetables. This might be due to their ignorance about the post harvest management and value addition. The content of the agri-portal should address these identified information needs.

CONCLUSION

It was observed that major sources of farm information to the farmers were progressive farmers and input dealers. It was found that a high percentage of farmers were the owners of modern Information and Communication Technologies. The farmers preferred certain sources for accessing specific information. Radio was more preferred for information about production and protection technologies and market information. the information sources such as radio, progressive farmers, extension literature, Krishi Vigyan Kendra and newspaper were perceived to be relatively more accurate compared to other sources such as friends/neighbours, input dealers, television and village level worker. There is tremendous scope for dissemination of farm technology information through ICTs including mobile. The possession of mobile was found to be very high in study area. Suitable content based of the identified information need of the farmers are to be developed so that the information disseminated can be usable by the end users.

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Constraints in The Management of The Model Dairy Plant: A Case Study

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ABSTRACT

The study was conducted at the Model Dairy Plant (MDP), NDRI, Karnal (Haryana), purposively selected as a case, so as to study the various constraints perceived by the personnel employed at the plant, in the plant management. As it was a “Case-Study”, complete enumeration was done for selection of employees, workers and in-plant trainees as the respondents. An open-ended schedule was developed and the respondents were asked to list out the perceived constraints, followed by final screening and sorting depending upon their frequency of occurrence. The “Garret Ranking method (1981)” was followed to rank the constraints. The major constraints perceived by the permanent employees of the top and middle level of management were inadequate finance, under-utilization of the capacity of the dairy plant, inadequate infrastructural facilities, inadequate manpower availability, poor storage facilities, and lack of trained personnel. The constraints perceived by the permanent employees of the lower level management and the temporary workers at the MDP were lack of medical facilities, transportation facilities, rest room, refreshment, recreation, etc., and inadequate bonus, low salary/wages, long working hours, etc., respectively. The major constraints perceived by in-plant trainees were lack of full time instructor(s), inadequate arrangements for demonstration of operations, inadequate stipend, and lack of arrangement vis-à-vis visit to other successful/commercial dairy plants.

Keywords: Model Dairy Plant, Management, Constraints, Case-study

INTRODUCTION

The term ‘constraint’ literally refers to the quality/state of being checked, restricted or compelled to avoid some action. A constraint is anything that limits a system (company or agency) in reaching its goal (Goldratt, 1990). Constraints could be physical (equipment, facilities, material, people), or they could be policies (laws, regulations, or the way we choose to do business- or choose not to do business), which may hinder the effective and efficient management of a dairy plant. The proper management of the staff in all the sections of a dairy plant also happens to be an important task as dairy plants cannot afford the dissatisfaction of the employees, as it would affect, adversely, its daily operations. The importance of acknowledging the constraints perceived by the employees and workers working in the plant is of utmost importance for the uninterrupted, effective and efficient functioning of the dairy plant. Even the constraints perceived by the top

management with respect to the management of the plant and the employees should also be ascertained and dealt with in an appropriate manner. Therefore, present study was carried out to know the constraints perceived by all categories of stake-holders involved in functioning of the dairy plant.

MATERIAL AND METHODS

The present study was conducted at the purposively selected Model Dairy Plant, NDRI, Karnal, situated in the State of Haryana, which was selected as a case because it is a unique dairy plant existing in the Northern India, with state-of-the-art technology, and also has its unique set of characteristics and properties which play an important role in its smooth functioning. As this study was based on “Case-Study mode”, complete enumeration was done in case of twenty personnel employed on a permanent basis, while all the workers employed on a temporary basis at the plant

were also selected as the respondents. In case of In-Plant Trainees, fifty trainees were completely enumerated from the list of ex-trainees of last two years, who had undergone training at the Model Dairy Plant. For this, a well-structured “Interview-Schedule” was mailed to the fifty ex-trainees, after incorporating certain changes/modifications in it (so as to convert it into a kind of questionnaire). However, the response of only thirty-four ex-trainees, i.e. respondents could be obtained. In addition, six in-plant trainees, already undergoing trainings at the plant, at the time of data-collection, were also selected as the respondents of this study. For the purpose of identifying the constraints, an open-ended schedule was developed for this study. In the preliminary survey, the respondents were asked to list out the factors which they felt, hindered the management of the dairy plant. A final screening and sorting out of the constraints was undertaken depending upon their frequency of occurrence. The top six most frequent constraints in case of the permanent employees of top and middle-level management; and the top ten most frequent constraints were selected in case of the permanent employees of lower level management, for the purpose of their final prioritization by using Garret Ranking Technique. In case of temporary employees and in-plant trainees, the top ten most frequent constraints were selected. Then, during the actual data collection, the respondents were asked to rank each of the constraints as relevant to them, according to the degree of importance as perceived by them. As all the items were not ranked by all the respondents, the “method of combining of incomplete order of merit ratings” as suggested by Garret (1981) was followed.

RESULTS AND DISCUSSION

Table 1 depicts that the ‘inadequate finance’ was perceived to be the most serious constraint in the management of the Model Dairy Plant (MDP). As the MDP was an autonomous body, it was not funded by

any external agency, instead, it has to pay back the loan to NDDB, so it was facing an inadequacy of finance, due to which the management of the plant could not achieve perfection. Huli (1989) also reported that insufficient capital was found to be the main constraint affecting the continued growth of dairy plants. The second serious constraint perceived was ‘Under-utilization of the capacity of the dairy plant vis-à-vis handling of milk on daily basis’. The MDP was not in full functioning condition, as most of its processing sections except liquid milk and ghee, were utilized only for experimental and training purposes, and not for production purposes, thus leading to the under-utilisation of the capacity of dairy plant. ‘Inadequate infrastructural facilities’ at the MDP was perceived as the third important constraint. This constraint was a consequence of the inadequate finance, due to which the plant was not able to develop new infrastructure as well as replace the old machines, etc. The ‘inadequate manpower availability’ was also found to be a significant constraint affecting the proper functioning of the MDP. ‘Poor storage facilities’ was another very important constraint due to which the management was facing many problems, as there was a shortage of space for storage of different articles like machine spares, packaging film, ghee, butter, skim milk powder, etc., all of which ought to be kept in separate rooms. Another significant perceived constraint was the ‘lack of trained personnel to operate the machines and qualified experts for repair works’. Jarial (2003) also found out that the major constraints perceived by the Model Dairy Plant personnel were related to: finance, technology, transportation, (poor) canteen and toilet facilities, and (inadequate) recreation facilities. Rangasamy and Dhaka (2007) revealed that the economic efficiency of dairy plants is severely influenced by a variety of constraints at three important value-addition stages viz. milk procurement, processing and manufacturing, and distribution of dairy products.

Table 1: Constraints perceived by permanent employees at the top and middle levels of management with respect to management of the model dairy plant (N=12)

Constraints	Mean score	Rank
Inadequate infrastructural facilities	50.50	3
Lack of trained personnel to operate the machines and qualified experts for repair works	40.14	6
Under-utilization of the capacity of the dairy plant vis-à-vis handling of milk on daily basis	64.09	2
Inadequate finance	65.92	1
Inadequate availability of manpower	49.10	4
Poor storage facilities	44.00	5

Amongst the various constraints perceived by the permanent employees of the lower level management at the Model Dairy Plant, the 'lack of medical facilities for self and family members' was the most serious constraint for the employees. 'Lack of rest room' was the second most important perceived constraint followed by 'Inadequate bonus (festival allowances/advances, etc)' as the third perceived constraint. According to this category of respondents, 'Lack of facilities for refreshment, recreation, etc' and 'Lack of transportation facilities (to and fro)' were the other important constraints as perceived by the respondents.

Amongst the various constraints perceived by the temporary employees working at the Model Dairy Plant, 'deduction of money by the contractor' was perceived as the most important constraint by the respondents. 'Inadequate bonus (festival allowances/advances, etc)' was the second important constraint, followed by 'long working-hours' as the third significant constraint for the temporary employees. 'Lack of medical facilities for self and family members' and 'lack of rest room' were the

other important constraints perceived by them. Other constraints were 'lack of proper exposure w. r. t. training & orientation regarding one's job', 'lack of empathy and social bonding on the part of superiors' was another constraint perceived by the temporary employees.

The 'lack of full-time instructor(s)' was the most important constraint perceived by the in-plant trainees. They strongly felt the need of having a full-time practical training instructor, who could keep an eye on every trainee. The "limited opportunities with respect to 'learning by doing'" was perceived as the second important constraint by the in-plant trainees. They were of the opinion that they would learn better if they were given conditions where they would perform the task instead of just watching it being done. The third important constraint as perceived by the trainees was the "inadequate arrangements for demonstration of operations" at the MDP. The "inadequate stipend" was another significant constraint perceived by the trainees. "Lack of arrangement vis-à-vis visit to other successful/commercial dairy plants" was the fifth important

Table 2: Constraints perceived by permanent employees at the lower level of management with respect to management of the model dairy plant (N=08)

Constraints	Mean score	Rank
No involvement in decision-making process	38.25	9
Long working-hours	48.16	7
Low salary/wages w. r. t. experience and qualifications	48.87	6
Inadequate bonus (festival allowances/advances, etc)	65.25	3
Lack of empathy and social bonding on the part of superiors	44.67	8
More stress on operators in operating machines/assigned job	33.5	10
Lack of transportation facilities (to and fro)	50.83	5
Lack of medical facilities for self and family members	74.25	1
Lack of facilities for refreshment, recreation, etc	54.5	4
Lack of rest room	72.12	2

Table 3: Constraints perceived by temporary employees with respect to management of the model dairy plant (N=40)

Constraints	Mean score	Rank
Lack of proper exposure w. r. t. training & orientation regarding one's job	37.93	8
Long working-hours	67.67	3
Deduction of money by the contractor	73.80	1
Inadequate bonus (festival allowances/advances, etc)	72.77	2
Lack of empathy and social bonding on the part of superiors	35.40	9
More stress on operators in operating machines/assigned job	33.79	10
Lack of transportation facilities (to and fro)	45.72	6
Lack of medical facilities for self and family members	56.02	4
Lack of facilities for refreshment, recreation, etc	45.66	7
Lack of rest room	51.12	5

Table 4: Constraints perceived by In-Plant Trainees with respect to Management as well as their training at the Model Dairy Plant (N=40)

Constraints	Mean score	Rank
Lack of full-time instructor(s)	65.21	1
Limited opportunities w. r. t. 'learning by doing'	64.03	2
Inadequate arrangements for demonstration of operations	63.7	3
Difficulty w. r. t. operation(s)/Handling of the machines/equipments	50.23	6
Lack of classroom facilities and other physical facilities	44.6	7
Inadequate stipend	63.18	4
Lack of empathy and social bonding on the part of staff/superiors	35.72	10
Lack of arrangement vis-à-vis visit to other successful/commercial dairy plants	51.15	5
Inadequate time for leisure/rest/holidays	39.2	9
Lack of facilities for refreshment, recreation, etc.	43.43	8

constraint felt by the trainees, as they felt the need of exposure to some other successful commercial dairy plants to have a first-hand experience of such plants. "Difficulty with respect to operation(s)/Handling of the machines/equipments" and "lack of classroom facilities and other physical facilities" were other important constraints as perceived by the in-plant trainees. Jarial (2003) also reported that the major constraints as perceived by the 'in-plant trainees' were: lack of full time instructor, poor canteen and toilet facilities, (lengthy) training duration at 'Model Dairy Plant', timing of in-plant training; and lack of training exposure at other commercial dairies.

CONCLUSION

Present study can act as a catalyst to increase the activity of the selected as well as other similar dairy plants to solve their problems related to the management of the

plant, thereby creating a more conducive environment for the successful functioning of the plant.

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Acceptability of Drudgery Reducing Hand Tools By Hill Farm Women

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ABSTRACT

The study was conducted in Mundla village of Himachal Pradesh, India, to find out the acceptability of drudgery reducing hand tools (serrated sickle and tubular maize sheller) by hill farm women through action research. Demonstration-cum-lecture technique was used to introduce the tools to the respondents. Later on, these tools were handed over to them for use. Acceptability was studied in terms of three components i.e. knowledge gain, attitudinal change and symbolic adoption. The results revealed that majority of the respondents who had high gain in knowledge also possessed favourable attitude and symbolic adoption of both the tools. Thus, serrated sickle was found to be highly acceptable and tubular maize sheller as moderately acceptable by most of the respondents.

Keywords: Drudgery, Reducing hand, Farm women

INTRODUCTION

Agriculture from time immemorial has been a way of life and family occupation of the Indian people. Women played and continue to play a key role in agricultural sector in India. India is a country where 90 percent of the agricultural practices are performed by using primitive tools and methods, which have been in use for centuries, and this may be due to their limited knowledge and skill in application of science and technology to daily living, resulting in fatigue and drudgery at every moment (Rajamal *et al.*, 1991). Though agriculture is the backbone of India's economy yet technological innovation to change the primitive method of cultivation is at infancy among the farm women folk of country.

In the hill regions of Himachal Pradesh, maize is the staple food. Shelling of maize is done by beating or by nibbing the cobs with fingers. Shelling by beating causes injury to the grains whereas nibbing with hands involve long time and hard labour (Devnani 1982). The farmers in these regions are also very poor and cannot afford power operated maize shelling machine due to high cost and skilled operation. Similarly wheat, the major cereal crop is harvested manually with sickles. In spite of advent of reapers, movers and combines, sickle is the most popular harvesting tool in Indian farms.

Manual harvesting of cereals require 110 to 140 man-hrs per hectare, therefore causes peak labour demand during harvesting season, thus an improved sickle would help in increasing the labour efficiency and reducing some drudgery during harvesting operation. Devnani (1982) reported that the serrations of the serrated edged sickle act as small pointed chisels which tear the outer layer of the stems thus helps in easier cutting of plants

The ultimate goal of farming should not only be growing crops, but the perfection in operation to achieve higher output with lower drudgery, minimum ill-effects and emoluments. Bahl *et al.* (1994) reported that the farm women use traditional implements and technology which do not give the desired results. It calls for the introduction of improved implements. Therefore, in order to improve the efficiency and productivity of the farm women, a need was felt to make them aware of the small, simple, low cost hand operated tools i.e. serrated sickle and tubular maize sheller for greater output and safety.

MATERIAL AND METHODS

The study was conducted in Kangra district of Himachal Pradesh. Mundla village from Nagrota Bagwan block of Kangra district was randomly selected from a list of villages. For assessing the acceptability, action research methodology was followed. The

requisite information was collected from sixty farmwomen with the help of an interview schedule. Tools identified as most suitable on the basis of judges' consensus were: serrated sickle and tubular maize sheller. Serrated sickle is a light weight, serrated blade balanced sickle, made of medium carbon heat treated steel for cutting cereals, pulse crops including thin stemmed crops like grasses, etc. Tubular maize sheller is provided with four tapered fins inside it. The cob is inserted into the sheller and rotated by hand to remove the grains.

The information on different aspects of these selected tools was disseminated by the demonstration-cum-lecture technique and later on the tools were distributed among the respondents. After having used the tools for a fortnight, post -exposure data was collected. Acceptability has been operationalized as the sum total of scores obtained by a respondent for knowledge gain, attitudinal change and symbolic adoption. It was measured and quantified by summing the index of each component (knowledge gain, attitudinal change, and symbolic adoption) as acceptability index of every individual member. The total number of questions in the inventory included potentiality scores (P), whereas obtained scores depicted the extent (E). On the basis of these, individual indices were calculated as the percentage of obtained score out of potential score.

$$\text{Acceptability Index (AI)} = \frac{E(\text{KGI})}{P(\text{KGI})} + \frac{E(\text{ACI})}{P(\text{ACI})} + \frac{E(\text{SAI})}{P(\text{SAI})}$$

Where, E = Extent (obtained limit), P = Potential (maximum limit), Knowledge Gain Index (KGI), Attitudinal Change Index (ACI), Symbolic Adoption Index (SAI)

RESULTS AND DISCUSSION

The results presented in Table 1 revealed that most of the respondents i.e. 60.00 percent and 63.33 percent had moderately high gain in knowledge regarding serrated sickle and tubular maize sheller while 81.67 percent and exactly 55.00 percent of the respondents developed more favourable attitude towards the two tools respectively. In case of symbolic adoption, similar trend was observed i.e. majority of the respondents (86.67%and 81.67%) were having moderately high symbolic adoption for improved sickle and tubular maize sheller after the execution of action programme. Gain in knowledge, attitudinal change and symbolic

Table 1: Distribution of respondents on the basis of gain in knowledge, attitudinal change and symbolic adoption regarding improved sickle and tubular maize sheller (N=60)

Variable	Improved sickle (%)	Tubular maize sheller (%)
Gain in knowledge		
Moderately low (<median)	40.00	36.67
Moderately high (>median)	60.00	63.33
Attitudinal change		
Less favourable (<median)	18.33	45.00
More favourable (>median)	81.67	55.00
Symbolic adoption		
Moderately low (<median)	13.33	18.33
Moderately high (>median)	86.67	81.67

adoption by majority of the respondents regarding both the selected hand tools might be due to their capability of fulfilling needs of farm women i.e. reducing their drudgery in farm work as Singh and Singh (1975), Sharma (1985) reported that serrated edged sickles required less force than plain edged sickles of all types and reduces drudgery thus such sickles should be popularized among farmers.

It is evident from Table 2 that for both the selected tools, majority of the respondents attained medium level of knowledge gain index followed by that of high and low level of knowledge gain index. Kaushik (1989) and Lega (1989) also emphasized that action programmes are helpful in improving gain in knowledge among the rural clientele. Table 3 clearly depicts that majority of the respondents developed most favourable attitude regarding both the tools followed by moderately favourable and less favourable attitudinal change index. It implies that demonstration plays an important role in developing favourable attitude of farm women towards the innovation.

Table 2: Frequency distribution of respondents on the basis of knowledge gain index with regard to improved sickle and tubular maize sheller (N=60)

Knowledge gain index	Percentage
Improved sickle	
Low (39-55)	20.00
Medium (56-71)	51.67
High (72-87)	28.33
Tubular maize sheller	
Low (44-58)	08.33
Medium (59-72)	56.67
High (73-86)	35.00

Table 3: Frequency distribution of respondents on the basis of attitudinal change index with regard to improved sickle and tubular maize sheller (N=60)

Attitudinal change index	Percentage
Improved sickle	
Less favourable (37-58)	08.33
Moderately favourable (59-79)	28.33
More favourable (80-100)	63.33
Tubular maize sheller	
Less favourable (37-58)	13.33
Moderately favourable (59-79)	31.67
More favourable (80-100)	55.00

Similar to knowledge gain index, most of the respondents (55.00%) had medium level of symbolic adoption index whereas 30.00 and 15.00 percent fell in the category of those who had high and low level of symbolic adoption index regarding improved sickle (Table 4). For tubular maize sheller, nearly 55.00 percent of the respondents were having medium level of symbolic adoption index followed by 26.67 and 16.66 percent with low and high level of symbolic adoption index. Table 5 indicates that improved sickle was found to be highly acceptable and tubular maize sheller as moderately acceptable by most of the respondents. Thus, one can observe relatively low level of symbolic adoption for tubular maize sheller, which may be due to the fact that this implement was comparatively new to the respondents and they might not have been able to adapt themselves to it in such a short duration.

CONCLUSION

High gain in knowledge, favourable attitude developed and high rate of symbolic adoption by majority of the respondents indicate that action programme has resulted in the desired change i.e. knowledge gain, developing favourable attitude leading to the adoption of the innovation as people tend to either approve or disapprove the innovation on the basis of possessing favourable or unfavourable attitude towards the innovation. It goes to confirm that if adequate knowledge is acquired, the individual realizes pros and cons of the innovation and develop favourable attitude and as a result of this change mental deliberations are made before final acceptance of the idea.

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Table 4: Frequency distribution of respondents on the basis of symbolic adoption index with regard to improved sickle and tubular maize sheller (N=60)

Symbolic adoption index	Percentage
Improved Sickle	
Low (50-66)	15.00
Medium (67-83)	55.00
High (84-100)	30.00
Tubular maize sheller	
Low (50-66)	26.67
Medium (67-83)	56.66
High (84-100)	16.66

Table 5: Frequency distribution of respondents on the basis of acceptability index with regard to improved sickle and tubular maize sheller (N=60)

Acceptability index	Percentage
Improved sickle	
Least acceptable (146-189)	13.33
Moderately acceptable (190-232)	40.00
Highly acceptable (233-275)	46.67
Tubular maize sheller	
Least acceptable (157-198)	16.67
Moderately acceptable (199-239)	48.33
Highly acceptable (240-280)	35.00

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A Theoretical Perspective on Research-Extension-Farmer Linkages

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ABSTRACT

Scientists involved in basic, strategic, applied and adaptive research, together with subject matter specialists, extension workers and farmers should be seen as participants in a single agricultural knowledge and information system. The interface between research and technology transfer is an important one in determining the performance of the whole system. The conventional argument for linkages is that by working together these actors stand better chances for establishing the institutional relationships that can facilitate access to technology, information, capital and marketing arrangements which can in turn enable the farmers to be competitive. The purpose of this paper is to build a theoretical perspective in terms of research-extension-farmer linkages in agriculture sector. A thorough review on all the aspects of research-extension-farmer linkage system has been presented and discussed. It can be stated that the constraints which hinder these linkages potentially affect the agricultural output of farmers, whereas effective links will allow farmers to enhance their output through the availability of farming innovations.

Keywords: Research, Extension, Farmer, Linkage mechanisms

INTRODUCTION

The term 'linkage' according to Webster's Dictionary, means series or systems of links. Literally, link means anything serving to connect or tie. Linkage is clusters of channels, which connect one major component with other major components (Axinn and Thorat 1972). The concept of linkage implies the communication and working relationship established between two or more organisations pursuing commonly shared objectives in order to have regular contact and improved agricultural productivity. Havelock (1986) contends that linkage is a term used to indicate that two systems are connected by messages so as to form a greater system. He argues that if the barriers between two systems are permeable enough for messages and responses to flow out of each to the other, then a link has been created between the two. The word linkage also means to chain in one way or other (Sharma 1982) and a chain may have two functions, namely, i) to keep a check, to control or to limit movement up to a certain point and ii) to facilitate co-ordinated/controlled movement for advancement or for fulfillment of some desired or productive purpose. The above two roles may be expected of a linkage too. In the context of communication, the term link is used to indicate the existence of communication facilities between two points. In agriculture sector; research,

extension services and farmers are three systems which are linked by information flow and feedback. Linking roles had been closely related to the dissemination and utilization of knowledge. The natural starting point for the discussion of linking role is knowledge gap i.e. the situation for which linkage is required (Havelock *et al.*, 1971).

For agro technologies to be relevant to local needs; researchers, extension workers and farmers must play important roles in identifying research problems, adapting the recommendations to local conditions and providing feedback to researchers about the innovations that have been developed. Effective communication links between researchers and extensionists are vital in the modification of technological recommendations and in initiating further research. Such links enable new technologies and management practices to be suited to local ecological conditions. The overall system of extension and transfer of technology depends on effective and integrated functioning of: a) Research management system, b) Extension management system, c) Support and sustenance management system and d) Target beneficiaries management system (Bhatnagar *et al.*, 1987). Seven systems in the chain of technology transfer viz. research, extension, client, input, economic, psycho-socio-cultural and administrative and

organisational systems have been suggested by Reddy (1981) and these are inter-related so much as to be deemed as the essential links in the chain of technology transfer. None of these interlinked systems should be underrated, much less ignored because the chain is as strong as its weakest link and extension service should establish functional linkages with related support systems (Venkataraman, 1988). The success in agricultural development can come about only through combined efforts and hence it is essential to foster continuously strong extension and research linkages. For effective transfer of technology, strong inter-organisational linkage is of vital significance because of the involvement of various organisations in the process (Sen, 1984) and weak linkages among research, education and extension institutions result in systematic bottlenecks in national agricultural technology systems and limit their effectiveness to contribute to development (Roling, 1989 and Kaimowitz, 1989).

In a report of the National Commission on Agriculture, (Government of India, 1976) it was considered necessary for Agricultural Universities and concerned State Departments to co-ordinate their efforts in order to develop useful technology and effectively serve the farming community. The need for some kind of linking system to bridge the gap between the research and client systems has also been stressed by many social scientists (Allen, 1977; Kunju, 1992 and Crowder and Anderson, 1997). Indian Council of Agricultural Research in its report of the review committee on Agricultural Universities (1978) stated that "linkage arrangements can only provide the formal framework of coordination and it is essential that the Agricultural Universities and State Government should devote considerable time and effort to give practical shape and content to such memoranda of understanding. For this it is imperative on the part of senior officers and scientists to make a deliberate attempt to develop harmonious working relationship through both formal and informal contacts". Systematic linkage with various sources of farm information provides any extension programme, its initial start up force (Pandey and Mishra 1984) and is a basic requirement for proper processing and transmission of relevant technology to the extension workers and farmers. Research and extension activities are highly interdependent and the research workers should associate with extension specialists to keep them in touch with the local farmers (Moseman, 1970; Reddy, 1981 and Desai, 1987). Researchers, extensionists and

teachers can learn a lot from farmers (Sabarathnam, 2000), if there is proper linkage with the farmers and among themselves. Farmers on their own, follow many age-old practices, which are called indigenous technologies. The researchers and extensionists can learn a lot from farmers about these technologies which are time tested and ecologically sound if they have a proper linkage with the farmers. The conventional argument for linkages is that by working together these actors stand better chances for establishing the institutional relationships that can facilitate access to technology, information, capital and marketing arrangements which can in turn enable the farmers to be competitive. Consolidation of research-extension-farmer can prove to be a safeguard for their benefit in the respect that the proper linkage ensures that researchers concentrate on farmers' priorities, needs and pressing problems (Elfaki, 2002) and promotes farmers access to innovations whether they are in the form of input services, information or advise; farmers' knowledge and experiences with the new technologies are fed back to researchers and proper linkage is likely to ensure the adaptation and compatibility of technology to agronomic and socio-economic conditions of the farmers that accelerates the adoption process of the technology.

Types of research-extension-farmer linkages

Four types of linkages viz. enabling linkages, functional linkages, normative linkages and diffused linkages have been identified by Esman (1986). Enabling linkages include connections with those elements in the environment which provide the institution with legal authority to operate and which give it access to essential resources. Functional linkages involve tie-ups or relationships with elements in society on which the institution depends for its operation and for its contribution to society. Connections with inputs supply agencies, processing agencies, farmers, markets, educational institutions, other research stations, planning and policy bodies and rural organizations come under this category. Normative linkages refer to contacts with elements that establish standards, that dictate terms and propagate society's values. Diffused linkages are relationships with those in the general public that are not easily categorized. They represent individuals or groups that are not formally or directly related to any institution or agency.

Another type of classification based on ways of communication and channels of communication has

been done by Stoop (1988) who has identified four major types of linkages viz. *Formal' versus 'Informal' linkages* where formal linkages refer to linkages that are specified and agreed to by organizations and informal linkages are direct person-to-person contacts, based on the need for collaboration between individuals. *'Top-down' versus 'Bottom-up' linkages* where in top-down linkage, information flows from scientists to extension and then to producers. In case of Bottom-up linkages, the flow of information is from producers to scientists. *'Internal' versus 'External' linkages* where Internal linkages refer to linkages among scientists working in different disciplines and on different commodities, whereas external linkages are linkages with major clients, such as farmers, policy-makers, etc. *'Downstream' versus 'Upstream' linkages* These linkages are a part of external linkages. Upstream linkages occur between research and policy making. The aim here is to secure adequate funding and political support for research. Downstream linkages occur between researchers and producers, to set research agendas and to establish priorities.

The type of research–extension linkage in a given country can also be determined by using the theoretical framework embodied in the five forms of linkage as given by Agbamu (2000). The overall criteria used in the theoretical classification of linkage forms are: (1) the status of agricultural research and extension organisations relative to one another, and (2) the transfer methods of sourcing research problems, deciding on research themes, and research results – these methods are classified as either top-down or bottom-up approaches. First form of linkages states that research and extension organisations operate at the same status in a country, using a bottom up approach in decision-making on linkage activities. Second form states that both organisations have the same operative status, using a top-down approach to manage the links. Third form of linkages states that research and extension organisations have unequal status, and the linkage system operates according to a bottom-up management approach. Fourth form states that both organisations are unequal in status, and the linkages operate according to a top-down management approach. Form fifth states that there is no organised linkage system between agricultural research and extension organisations. The bottom-up method of sourcing research problems and decision-making in linkage forms first and third presume that these forms of linkage work more efficiently if prefectural, provincial

or state governments possess their own independent agricultural research stations and extension agencies.

Research-Extension-Farmer Linkage Mechanisms

Linkage mechanisms can be grouped in various ways: by form (e.g., media), by task (e.g., seed multiplication), by degree of formality (e.g., ad hoc versus formal committee), by managerial level (e.g., field trial team), by structure and organization (e.g., combining research and extension functions into one unit) or by function (e.g., collaborative task) (Eponou, 1993 and Merrill and Kaimowitz, 1989). Research and technology transfer institutions, managers, units, or personnel may link with each other for six broadly defined functions viz. Planning and review; Collaborative activities; Exchange of resources; Dissemination of knowledge and information; Evaluation and feedback and Coordination (Eponou, 1993). Linkage mechanisms are used for specific functions and interactions. Some authors have categorized linkage mechanisms into two basic types i.e. organizational and managerial (Swanson 1997). Organizational mechanisms involve the structural modification of the research and/or extension organization or other organizations that are involved in an Agricultural Technology System (ATS). The other major type of linkage mechanisms involves a range of managerial interventions. For example, research and extension may agree to collaborate on joint planning and review activities, such as conducting participatory rural appraisal in different agro-ecological etc. These activities would likely result in joint priority-setting and planning collaborative programme activities. Research and extension may link with each other for six broadly defined purposes (Adiyoga, 1994) viz. planning and review of programmes and activities; professional collaboration for joint activities; exchange of resources; dissemination of information and knowledge; feedback and coordination.

While an elaborate research extension linkage mechanism established in India for the past one and a half decade, actual functioning and quality of interactions in these foray leaves much to the desired (Anonymous, 1992). Scientists were getting the feedback about farmers' problems through official records of the disseminating agencies (Rathore, 2000) and the experts were not having regular direct contact with the farmers (Intodia, 1998). Though there was a formal mechanism of linkage existing at various levels, the linkage was not effective in actual sense on the part of all the scientists.

Apart from selected master trainers, the direct linkage of the scientists with the farmers was limited to lectures. Zonal Research Extension Advisory Committee meetings in India assess the problems of agro-climatic zones and, consequently, research programmes do not get re-oriented to generate location specific technologies. The monthly workshops are the places where scientists and extension functionaries meet to work out technology packages relevant for the coming months, but, these workshops have become so routinized and repetitive (Sabarathnam, 2000) without adequate preplanning which has resulted in little time being devoted for documenting and analyzing field level situations and constraints. The social scientists believed that there was no relationship between the number of linkage mechanisms in the system and the level of integration of research and technology transfer (Eponou, 1993), rather, in some cases time was wasted due to inappropriate mechanisms or these could not be properly used.

Status of Research-Extension-Farmer Linkages

Many studies have revealed that no effective links exist between the research and extension systems, a situation detrimental to the effectiveness of both (Jaiswal and Arya 1981; Singh 1984; Rehiman *et al.*, 1991 and Sinha, 1996). There is one school of thought which believes that the research being carried is not relevant to the farmer situation (Eponou, 1993) and this lack of research is due to poor linkages between the research and its client i.e. farmers and extension workers. The agricultural technology system in many developing countries suffer from weak linkages and in some countries, they do not exist even. In most developing countries including India, communication between public research and extension agencies is weak and is by and large through farm journals, magazines and extension literature (Jaiswal and Das, 1981; Surendran, 1982 and Anonymous, 1984).

Developing effective links with extension is a chronically weak area in an organization (Kean and Singango 1990) and too often, research and extension have become top-down, bureaucratic organizations that are not receptive or responsive to the needs of farmers (Swanson 1997) which leads to weak linkages between research institutes and universities, weak liaison with extension services and poor contact with farmers (Arnon 1989). Under these circumstances, research efforts have had little impact on the economy. An

evaluation of the World Bank experience in agricultural research and extension (1985) states that in Sudan many researchers in the national research organization did not even recognize the need to be accountable for their results. It is the situation of many of the Third World research systems, where highly trained researchers conduct their research in highly controlled environments with excellent access to inputs and labor and pass their results to extension which is supposed to disseminate them to the client. Such type of technology has been found to by-pass the majority of the farmers (Chamber and Ghildyal 1985) or being irrelevant to their needs (Bourgeois, 1990). In the analysis and evaluation of an agricultural extension and research liaison service in Nigeria (Ekpere and Idowu, 1990), question was raised as to why after so many years of government support and huge investment in research and extension services, agriculture has remained traditional and has failed to undergo any appreciable science-driven transformation. One reason found was the poor link between research, extension and farmers. Farmers generally viewed research workers as a distant referent (Beal and Rogers 1959) and someone with whom they had little direct contact. In another study in Karnataka, researchers were found not discussing the programme of adaptive trials with farmers during the field days (Dudhani, 1980), were weak in writing newspaper articles relating to recommendations made from the research stations and did not visited the villages periodically. Often new technology is developed from the scientists' point of view only (Kaur, 1985) and while giving inputs of new technology; the attitudes, interests, perceptions, inhibitions and restrictions of villagers are not taken into account. Approach of farming system research rests on two central positions i.e. effective research on agricultural technology starts and ends with farmer and that integration of perceptions of biological scientists and social scientists is an essential element in such a research (Prasad and Reddy, 1986). It is argued that farmers generate and use knowledge, and are constantly experimenting to manage risks and improve their operations. They should therefore be the natural partners of researchers (Smith *et al.*, 2004) for a mutual exchange and reconciliation of modern and traditional knowledge. The lack of effective linkages and understanding of their importance among researchers and farmers may explain the present low adoption of technology and minimal research utilization in agricultural production systems. There is a growing mountain of shelved, perfected yet unutilized

research outputs, and there are large amounts of information getting tied up in journal publications targeted to peer groups rather than intended beneficiaries who rarely have access nor understand such publications.

On the other hand, contrary to the above findings, there is another school of thought which believed and indicated satisfaction regarding research extension linkages (Bhatnagar *et al.*, 1987) and that agricultural extension research liaison service set up effectively bridged the gap between research and technology transfer (Ekpere and Idowu, 1990). Many studies conducted nationally and internationally revealed that research and extension organizations had good linkages with each other (Prasad 2000). In countries like Japan and Mexico, research–extension system is characterized as a bottom-up approach with prefectural research and extension organisations of equal status while farmers' foundations and non-governmental organisations take final decisions on research needs/problems for the projects they finance or undertake jointly with government research stations (Agbamu, 2000).

Many studies have proved that top-down system has been successful in meeting the demands of resource rich farmers and producers of high value commodities as they are able to communicate their needs to researchers. However; small-scale, resource poor farmers have been left out of this system (Garforth, 1982; Chambers, 1983; Moris, 1983; Chambers and Ghildyal, 1985 and Ewell, 1989). Researchers in general had comparatively higher contact with farmers visiting office, influential farmers and farmers visiting *Kisan Melas* (Ambastha, 1986) but traditional farmers were the least contacted categories. Many technologies were not adopted by farmers as they have been designed without reference to the problem, priority and interests of those who are supposed to use them (Elfaki, 2002) with the result that small scale or resource-poor farmers, who constitute a large sector of the rural poor have not benefited of research & extension efforts.

Strategies for Strengthening the Research-Extension-Farmer Linkages

Conventional mechanisms such as involving farmers, extension agents and research scientists in on-farm trials, field days and demonstrations, participatory surveys/ Participatory Rural Appraisal (PRA), the farmer field school models for technology uptake pathways have helped research to forge links with

farmers while holding regular meetings with partners, who range from research scientists, extension agents and NGOs, farmers associations and in some cases private sector, have been found to be useful mechanisms for reviewing performance, identifying problems, allocating roles/responsibilities and resources, planning and coordinating research and development programmes (Kimenye, 2006). Institutionalizing Participatory Monitoring and Evaluation in research and dissemination work is coming up as an important partnership and linkage building mechanism. Decisions on the selection of farmers' problems/needs as annual research themes can be finalized at regional levels by committees comprising of researchers, administrators, subject-matter specialists, extension workers, farmers' representatives and knowledgeable persons (Agbamu, 2000). An advisory committee consisting of farmer-elected representatives who give each commodity research director, some specific direction and feedback on programme problems and priorities specific to each commodity at regional and/or national commodity research programme, an advisory committee that reflects the geographic interests, problems, and concerns of farmers within the province or region and a crop, livestock, and/or a general research advisory panel organized at the regional and/or national level to provide the opportunity for stakeholders' input into research policies, priorities, and other concerns can be constituted (Swanson, 1997) for fostering the research-extension-farmer linkages. At these higher system levels, agribusiness representatives (input suppliers and processors) may also join the farmers. In addition to these formal linkage mechanisms, both research and extension personnel would be expected to have regular, informal contacts with different groups of farmers in their respective service area. These linkages would occur through farmer participation in Rapid Rural Appraisal (RRA) or PRA activities, while carrying out joint on-farm trials and demonstrations and during meetings and field days where farmers would have the opportunity to articulate different problems and concerns. The involvement of farmers can vary from just doing the physical labour in an on-farm research plot in traditional on-farm research, over being a source of information and consultation in Farming Systems Research (Anonymous, 2007) and being a partner in the design and implementation of research. Research should manage to work with the resource poor farmers and come out with appropriate technology that suits their

physical as well as socioeconomic situation (Chambers and Ghilydal, 1985) and technology validation programmes should be effectively and jointly carried out on farmers' fields with active farmer participation (Pickering, 1987) coupled with a farmer to farmer extension approach (Naikin, 1996). The involvement of farmers in the diagnosis of the situation, the identification of the problem, development of alternative solution, experimentation of the technologies, evaluation and finally diffusion of the technologies (Elfaki, 2002) is probably one of the best francophone approaches and contribution to agricultural development as well as to the rural development field.

It is also believed that a good way to solve linkage problems is to manage research and technology transfer into a single institution (Bourgeois, 1990) as physical proximity, operating under the same management, share on institutional culture and direct supervision are perceived as ways to foster linkages between the two functions. Studies have revealed that creation of research extension liaison officer positions (Stoop, 1988) and involvement of SMS and District Agricultural Officers in Adaptive Research Planning Team (ARDP) committee (Sutherland, 1993) considerably improved the linkage between research and extension. Field orientation of scientists, stay of extensionists in the villages (Dupare and Sinha, 2000); direct feedback from the field through field visits undertaken by research scientists preferably accompanied by extension workers (Ravishankar and Nanjappa, 2000) and direct contact of the research institutions with the farmers through *Kisan Melas*, farmers' training programmes, participation in field days and meetings, etc. (Perur, 1973) could prove to be useful mechanisms to nurture these linkages. Some other strategies to improve research-extension-farmer linkages include decentralization of research activities, evaluation of performance of researchers based on the applicability of their research and extent of their participation in the linkage activities (Hobbs and Daag, 1988 and Stoop, 1988) and increasing individual incentives for collaborative activities with extension personnel (Hobbs and Daag, 1988).

Information and communication technology (ICT) in the present scenario has dramatically changed how technology is disseminated or made accessible and used worldwide (Faylon and Acoba, 2002) and the government agencies concerned take advantage of

opportunities brought about by ICT to facilitate technology transfer and to create important, new and broader linkages in agriculture, forestry and natural resources sectors. An ICT-mediated support service, capable of access across regions of India, available anytime with reasonable level of interactivity, can make a significant contribution towards rendering expert-farmer, expert-expert and farmer-farmer interactions considerably more effective (Shepherd, 2007). The advent of rural information access points, variously termed as village information kiosks, common services centers, rural knowledge centers etc, makes for the emergence of a possible new actor and stakeholder as their number is set to increase rapidly.

CONCLUSION

A critical review of the above presented literature showed that there is no single mechanism, which can by itself lead to establishment of strong linkages and partnerships in all situations. Rather, different combinations (hybrids) of methods and practices have been used depending on projects' circumstances and orientation. 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.

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Impact of Active Learning Programme on Development of Rural Aganwadi Children

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ABSTRACT

The present study assessed the impact of Active Learning Programme on the development of rural Aganwadi children, both boys and girls between the age of 2¹/₂ years to 5¹/₂ years attending Aganwadi of Sriganganagar district. A standardized developmental assessment checklist was used for pre and post test of active learning programme covering a sample of 60 boys and 60 girls. The significant differences were found in the pre and post test mean of the both boys and girls. From the results, it can be concluded that if the Aganwadi children are exposed to active learning programme promoting development then they have more opportunities for optimal learning and overall development.

Keywords: Active Learning Programme, Aganwadi, Pre-school children

INTRODUCTION

Early years of life are critical in a child's life span since the rate of development in these years is more rapid than at any other stage of development. It is the best time for bringing about long term changes in tender responsibility of young. During the pre-school years, a child develops approximately 70% of his/her brain connections, stimulation of brain during this period is imperative as it strengthens the connections and absorbs information like sponge (Sridhar 2003). Early years are crucial for the child's subsequent development. It is well known that the fact that the development of competence in individual is affected by variables in their social environment and early stimulation (Ramchandran, 1990). Environment stimulation has an important role in growth and development of children, that can be of various types like play opportunities, incentives intervention and many variables affect this stimulation like health, nutrition and pre-school institution. As number of vulnerable subjects in the society is very high, educational intervention in early years become quite important.

So, the importance of the early years and early childhood education can be never underestimated and it is more important for the children from under privileged sections who particularly deprived in getting access to stimulating environments, for giving

stimulating environment, it is necessary to develop programme which is based on active learning. The goal of ECCD programme through active learning approach is to improve young children capacity to develop and learn. Play which is an integral part of any active learning programme often involves physical activities. It is closely related to the development and refinement of children's gross and motor skills in their body awareness (Berk, 2002 Berry, 20002, Front *et al.*, 2001, Holnes & Geiger, 2002, Nucune and Zones, 2001). By providing pre-school education, the socially as well economically deprived and disadvantage children get scope for preparing themselves for formal education and thus the rate of drop outs will decrease (Badiger and Khadi, 2003). The pre-school age is very important age for future development. So during this age child should be provided with the suitable favorable and healthy environment, so that development is stimulated and enriched. The present study was envisaged to develop and test an active learning programme to enhance all round development of pre-school children at aganwadi centers of Sriganganagar.

MATERIAL AND METHODS

The study was conducted in the purposively selected villages of Sriganganagar district. The present study was an attempt to study the impact of active learning programme on the development of rural Aganwadi

children, both boys and girls. The total sample consisted of 60 boys and 60 girls between the age of 2 $\frac{1}{2}$ years to 5 $\frac{1}{2}$ years attending Aganwadi in two different villages of Sriganaganagar district. A standardized developmental assessment checklist developed by 'Mishra and Roy (1995)' for the children between the age of 2 $\frac{1}{2}$ years to 5 $\frac{1}{2}$ was used for collection of data. Pre and Post research design was used for testing the efficiency of the active learning programme. Mean weighted score was calculated and 't' test was applied .

RESULTS AND DISCUSSION

Table 1 shows that the pre test of girls belonging to the Aganwadi 12 GG had highest score in conceptual readiness and lowest in personal and social skill. In comparison to the post test, the net gain present was found highest in personal skill. The highest gain may be due to the proper opportunities provided to the children for play in group.

Boys of village 12GG had highest score in gross motor skills and lowest in language skill in the pre test; however, in the post test conceptual readiness skill was highest. The net gain in present was found highest for language development. Subjects were made to learn vocabulary, intangible, speech, conversation and relating experiences with the help of different type of activities and also stimulating environment provided to the subject for their language development. In the pre-test, the girls belonging to the village 9A had highest score in conceptual readiness and lowest in personal and social skills. In the post test, conceptual readiness skill and gross motor skills found highest. Net gain proves that when they were provided with stimulating environment through active learning programme they respond in a favorable manner and participated with full enthusiasm. Consequently their gross motor development were vastly improved. The boys had

highest score in gross motor skills and lowest in personal social skill in the pre-test. In the post -test conceptual readiness skill was highest. The net gain was found to be highest for gross motor skills. This may be due to the learning by performing certain activities again and again in a stimulating environment.

There was no significant difference in all development dimensions of the Aganwadi but significant differences were found in Pre and Post-test means of boys and girls of both Aganwadi's (Table 2). The analysis of pre and post test score shows that if the Aganwadi children are exposed to an active learning program promoting development then they can have more opportunities for optimal learning and overall development. It is now universally acknowledged that the early childhood age-span is the most crucial in human development. There is no other time in human life when so much is learned in so brief a period. In India, this awareness is reflected in the large scale government and private efforts to run balwadis, anganwadis (pre-school centres) and pre-primary schools. The quality, however, of the majority of these centers is poor. Inadequately trained teachers, lack of an appropriate curriculum and a dearth of learning materials make for unstimulating preschool programmes for young children in the 3-5 years age-group (Active Learning Methodology, 2006).

Active learning-the direct and immediate experiencing of objects, people, ideas, and events-is a necessary condition for cognitive restructuring and hence for development. Put simply, young children learn concepts, form ideas, and create their own symbols or abstractions through self-initiated activity-moving, listening, searching, feeling, manipulating. Such activity, carried on within a social context in which an alert and sensitive adult is a participant-observer, makes it possible for the child to be involved in intrinsically

Table 1: Pre and Post test score of subject belonging to selected Aganwadis

Major Area of development	No. of items	Girls of 12 GG village			Boys of 12 GG Village			Girls of 9 A Village			Boys of 9A Village		
		Mean weighted score		Net gain	Mean weighted score		Net gain	Mean weighted score		Net gain	Mean weighted score		Net gain
		Pre test	Post test		Pre test	Post test		Pre test	Post test		Pre test	Post test	
Gross motor skill	6	1.35	3.01	17.77	1.77	3.08	23.28	1.85	3.25	23.33	1.8	3.05	19.45
Fine motor skills	6	1.21	2.85	27.23	1.38	2.78	23.33	1.6	2.6	15.84	1.6	2.56	15.55
Conceptual readiness skills	6	1.65	3.86	7.67	1.58	3.48	23.75	2.0	3.28	14.79	1.8	3.33	18.12
Language skills	8	1.08	1.8	18.75	0.93	1.9	25.00	1.05	1.95	22.25	0.9	1.65	18.75
Personal skills	4	0.76	1.65	29.45	0.95	1.5	18.89	0.8	1.48	18.89	0.85	1.21	12.22

Table 2: Differences between boys and girls and Pre and Post test of selected Aganwadis

Major area of development	Boys and Girls 't' calculated	Pre and post test 't' calculated
Gross motor skill	1.22	17.50
Fine motor skills	0.81	15.21**
Conceptual readiness skills	0.14	12.97**
Language skills	0.44	6.95**
Personal skills	2.26	7.29**

interesting experiences that may produce contradictory conclusions and a consequent reorganization of the child's understanding of his or her world. In active learning programme, children are active agents who construct their own knowledge of the world as they transform their ideas and interactions into logical and intuitive sequences of thought and action, work with diverse materials to create personally meaningful experiences and outcomes, and talk about their experiences in their own words (Scottish Executive, 2007).

Scottish Executive (2007) explains that young children learn best when they have scope for active involvement in a wide range of learning experiences. The learning environment – both indoors and outdoors – needs to provide challenge and opportunity to explore exciting learning possibilities. All early years settings need to provide flexible and stimulating environments to fully engage children in their learning. At all stages this requires activities, space and resources to be well planned and organized. Sharma (1986) reinforce that in personal program a child gets the opportunity to play with other children and thus learn to share wait for his/her turn co-operate with her, sympathetic, independent, confident, and more self-reliant. The result of the study concerning language development can also be supported by Bust (2001). The results of present study indicate that the assessment of selected developmental aspects of children of selected Aganwadi showed that the wholesome development of them was not good as it should be. Children of both Aganwadi did not give satisfactory response in pre-test. The rural scenario usually inhabits the girls from social interaction and whatever social behaviour the rural girls exhibits are not guided by the adults. Thus the age appropriate personal social skills may be negligible evident in child's behaviour. Pre-schooler needs challenging learning environment with especially designed activities that

stimulate high level of thinking skills across range of domain of human cognitive. In the rural area more measure should be undertaken for the complete development and growth of children. The Aganwadi in rural area may not be considered as just the center to provided meal but as envisaged in the policy should promote the wholesome development of children. Development of activities packages in the accordance to their requirement and field testing them, is the need of the hour.

CONCLUSION

It can be concluded from the study that the wholesome development of children was not as good as it should be. After implementation of active learning programme significant different was found so if the Aganwadi children are exposed to a development promoting programme then they can have more opportunities for optimal learning and overall development. Need based development promoting program is the very essential component for the conducive development of the matter of the Aganwadies. It is proved that favorable and stimulating environment is required for overall development of children. Thus active learning programme should be introduced for the children coming to the Aganwadi center.

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Impact Analysis of Front Line Demonstrations (FLDs) on Gram (Chickpea) in Shivpuri District of Madhya Pradesh

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ABSTRACT

The present study was undertaken in Shivpuri district of Madhya Pradesh. The KVK Shivpuri has conducted 116 front line demonstrations (FLDs) on gram in six villages during 2007-08 to 2011-12 in Rabi season to bridge the extension gap. There was an appreciable increase in yield level ranging from 20.91 to 31.30% in the demonstration plots of chickpea during years under study. Adoption of improved technology had significant impact on yield. Improved technology enhanced chickpea yield from 300 kg to 500 kg/ha as compared to farmers practice with an overall increase of 28.18 percent.

Keywords: Chickpea, Demonstration, Farmers practice, Gap analysis and Productivity

INTRODUCTION

Chickpea (*Cicer arietinum*) is one of the most important leguminous crops of the world which is grown in around 40 countries across five continents. India is the largest producer of chickpea, producing around 75 percent of the world's total production. Madhya Pradesh has 29.37 percent shares in country's total area under chickpea. However, the average productivity in the state is low (711.93 kg/ha). This is not because of unavailability of improved technologies but because of lack of adoption of improved production technology. India produces 58.90 lakh tones chickpea in total 73.70 lakh hectare area with an average productivity 799.19kg/ha while Madhya Pradesh produces 22.65 lakh tones chickpea in area of 28.88 lakh ha with 785kg/ha average productivity.

District Shivpuri produces 85200 tones chickpea in 71000 ha area with an average productivity 1200 kg/ha. The FLDs on pulses is an important initiative by Ministry of Agriculture, Govt. of India for improving productivity of pulses in the country. The FLDs are conducted under the close supervision of KVK scientists. The main objective of FLDs on pulses is to demonstrate and popularize improved production technology on farmers' field under varied existing farming situations for effective transfer of generated

technology and fill the gap between improved technology and indigenous technology to enhance the productivity of pulses. It also encourages intensification and diversification for sustaining the production system. Keeping in view the importance of pulses in food security, and being vital component of our farming systems, KVKs are conducting FLDs on pulses to bring in enhanced application of modern technologies to generate yield data & gather farmers' feedback on various aspects. Keeping importance of FLDs in view, KVK Shivpuri has conducted 116 demonstrations on chickpea at farmers' field under irrigated situations during rabi 2007-08, 2008-09, 2009-10, 2010-11 and 2011-2012 seasons to demonstrate the performance of recommended high yielding varieties of chickpea and complete recommended package of practices for harvesting higher crop yield and to analyze the extension and technological gaps through FLDs on chickpea at farmers' field.

MATERIAL AND METHODS

Front line demonstrations on chickpea were conducted during Rabi seasons of the year 2007-08, 2008-09, 2009-10, 2010-11 & 2011-2012 at farmers' fields in district Shivpuri. Six villages namely Ratore, Piparsama, Badagaon, Karmachkala, Khybdakala and Dulara of two blocks viz. Shivpuri & Pohari were selected for FLDs

during the study period (2007-08 to 2011-12). About 47 ha area was covered under demonstrations of improved cultivation practices of chickpea using improved varieties. Total 116 farmers were closely associated with chickpea demonstrations. Each demonstration was of 0.42 ha area. Farmers were made aware about recommended package of practices through training programmes and provided quality seed of chickpea varieties namely JG-130 and JG-226 during all the five years of study. The sowing was done from last week of October to first week of November under rainfed/irrigated conditions and harvesting time was ranging from last fortnight of February to Mid of March. The Demonstrations on farmers' fields were regularly monitored by KVK scientists from time of sowing till harvesting time.

Observations were taken on various stages of the crop and grain yield of demonstrations was recorded and analyzed. Different parameters as suggested by

earlier researchers were used for calculating gap analysis, costs and returns. The details of different parameters are as follows:

Extension gap = Demonstration yield – farmers' practice yield

Effective gain = Additional return – Additional cost

Technology gap = Potential yield - Demonstration yield

Additional return = Return from demonstration – farmers' practice return

Incremental B: C ratio = Additional return / Additional cost

Technology index = potentially yield - Demonstration yield x 100 / Potentional yield

RESULTS AND DISCUSSION

Grain yield analysis: The increase in grain yield under demonstration was 24.13 to 31.30 per cent over farmers' local practice. On the basis of five years data, 26.35 percent yield advantage was recorded in demonstrations

Table 1: Comparison between demonstration package and existing farmers' practice of Chickpea

S.No.	Particular	Demonstration package	Farmers practice
1.	Farming situation	Rain fed medium black soils (Few farmers have facilities for 1-2 irrigations)	Rain fed medium black soils (Few farmers have facilities for 1-2 irrigations)
2.	Variety	JG-130 and JG-226	Use unidentified local seed
3.	Time of sowing	20-30 October	20 October to 20 November
4.	Method of sowing	Line sowing with use of seed cum fertidril	Line sowing & sometimes broadcasting method
5.	Seed rate	80 kg/ha	100-110 kg/ha
6.	Fertilizer dose	As per recommendation after soil testing	Use only DAP fertilizer
7.	Plant protection	Chickpea seeds are treated with bavistin 1 gm +2 gm Thiram or Vitavex Power for every kg of seed and IPM technology for control of insect pest	No seed treatment & IPM technology

Table 2: Chickpea scenario (area, production and productivity) of the district and state

S.No.	Year	Area: 000, ha		Production 000,tonnes		Productivity kg/ha	
		Shivpuri	M.P. State	Shivpuri	M.P. State	Shivpuri	M.P. State
1.	2007-08	57800	2661.8	59,190	1925.8	1250	724
2.	2008- 09	72500	2875.1	94,980	2814.7	1310	980
3.	2009-10	71000	3013.9	85,200	3221.3	1200	1070
4.	2010-11	71000	2888.4	85,200	2265.6	1200	785
5.	2011-12	71000	3043.7	85,200	3290.3	1200	1082
	Average	2896.58		2703.5		1232	928.2

carried out with improved cultivation technology as compared to farmers' traditional way of chickpea cultivation.

Gap analysis: An Extension gap of 139-500 kg/ha was found between demonstrated technology and farmers' practice during last five years and on an average basis the extension gap was 350.40 kg/ha (Table 3). The extension gap was lowest (139 kg/ha) in the year during 2011-12 and was highest (500 kg/ha) during 2008-09 i.e. the second year of demonstrations. Such a wide gap might be attributed to adoption of improved technology in demonstration which resulted in higher grain yield than the traditional farmers' practice.

The data given in Table 3 indicates wide technological gaps during different years of demonstrations, out of which, lowest (140 kg/ha) was found during the year 2011-2012 and highest (684 kg/ha) during 2007-08 i.e. on the starting year of the demonstrations. During five years, in 116 demonstrations, on an average 306.4 kg/ha technology gap was found in yield. The difference in technology gap during years could be due to more feasibility of recommended technologies during subsequent years. Similarly, the technology index for all the demonstrations during different years was in

accordance with technology gap. Higher technology index indicates the inadequate adoption of proven technologies among farmers. It may be due to insufficient extension services for transfer of technology. Technology index was found lowest (6.66) during the year 2011-12 and was highest (32.57) during 2007-08. When calculating the average of technology index of total 116 demonstrations, it was found 14.68 percent which is quite manageable during the years to come.

Economics analysis: On the basis of different variables like seed, fertilizers, bio-fertilizers and pesticides as cash inputs for the demonstrations as well as farmers' practice, an average additional cost of Rs. 1430/ha was calculated in demonstration plots. Net economic return from grain yield was calculated on minimum support price (MSP) basis which is varied during different years. Maximum return (Rs. 40800/ha) was obtained during the year 2011-12 due to higher grain yield. The higher additional return and effective gain obtained under demonstrations could be due to improved technology, non-monetary factors like timely operations of crop cultivation and regular monitoring by the scientists. The lowest and highest incremental benefit: cost ratio (IBCR) is ranging between 3.068 &

Table 3: Grain yield and gap analysis of FLDs on chickpea at farmers' field

Year	No. of demonstration	Variety/ technology	Potential yield (kg/ha)	Demonstration yield (kg/ha)	Farmers practice (kg/ha)	Increase (%)	Extension gap (kg/ha)	Technology gap (kg/ha)	Technology index
2007-2008	12	JG-130	2100	1416	1116	26.88	300	684	32.57
2008-2009	12	JG-130	2100	1750	1250	28.57	500	350	16.66
2009-2010	12	JG-226	2000	1800	1450	24.13	350	200	10.0
2010-2011	40	JG-130	2100	1942	1479	31.30	463	158	7.52
2011-2012	40	JG-130	2100	1960	1621	20.91	139	140	6.66
Average	23.2	-	2080	1773.60	1383.20	26.35	350.40	306.40	14.68

Table 4: Economics analysis of front line demonstration on chickpea at farmers' field

Year	Cost of cultivation (Rs./ha)		Additional cost in demo. (Rs./ha)	Gross return (Rs./ha)		Net return (Rs./ha)		Additional return (Rs./ha)	Effective gain (Rs./ha)	B:C ratio
	Demo.	F.P		Demo.	F.P	Demo.	F.P			
2007-08	14000	13000	1000	31152	24552	17152	11552	5600	4600	5.60
2008-09	14100	12900	1200	31250	23500	17150	10600	6550	5350	5.40
2009-10	13500	12000	1500	32130	24650	18630	12650	5980	4480	3.98
2010-11	11750	10800	950	31800	24218	20050	13418	6632	5682	6.98
2011-12	18000	15500	2500	58800	48630	40800	33130	7670	5170	3.068
Average	14270.0	12840	1430	37026.2	29110	22756.2	16270	6486.4	5056.4	5.0056

6.98 in 2011-12 and 2010-11, respectively (Table 4). It also depends on grain yield and MSP sale rates. An overall average IBCR was found as 5.005 which is uncourageous for the scientists conducting demonstrations on chickpea and also for the famers who are the ultimate beneficiaries of FLDs.

CONCLUSION

The technologies demonstrated in FLDs have the main stake for increasing the yield of chickpea and thus it can be said that FLD is the most successful tool for transfer of technology. The concept of front line demonstration may be applied to all farmer categories including progressive farmers for speedy and wider dissemination of the recommended practices. FLD plays a very important role in disseminating recommended technologies because it shows the potential of technologies resulting in an increase of yield at farmers' level. Under demonstrations, some specific technologies like seed treatment, seed rate, improved varieties, balance fertilizers, intercultural operations and plant protection measeures were undertaken in an appropriate manner which enable farmers to act as primary source

of technical information on improved practices of chickpea cultivation. Farmers also became a source of good quality seed for their locality and surrounding area.

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Knowledge Level of Soybean Growers Regarding Recommended Soybean Production Technology and Constraints There Off

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ABSTRACT

The present investigation was carried out in Burhanpur District of Madhya Pradesh. In study majority of the farmers were reported to have maximum knowledge about fertilizer application and improved variety of soybean. The farmers also reported that they were less aware about the seed treatment practices and plant protection measures. In nutshell, it may be concluded that majority of the farmers (61.95%) had wide knowledge gap in respect of seed treatment whereas, least knowledge gap was found in respect to fertilizer application (10.56%) and improved variety (15.56%) respectively. The most important constraint was extension gap in respect to low level of knowledge about improved soybean production technology which necessitates improved extension activities in the area.

Keywords: Knowledge level, Soybean, Recommended, Production, Technology, Constraints

INTRODUCTION

Soybean as a cash and profitable crop introduced in India about five decades past. It occupies more than 6 million hectare out of about 290 million hectare under oil seeds. Three states, viz., Madhya Pradesh, Maharashtra and Rajasthan account for nearly 97.5 per cent of soybean area of the country. Madhya Pradesh tops, with its share of about 80 per cent of the total area under soybean in the country. Other states could be regarded as "Tom-Thumbs" in case of soybean area. Research has played an important role during last 30 years in enhancing the area, production and productivity of soybean, which is the premier source of oilseeds, protein and the predominant vegetable oil in the world.

Soybean started growing in Madhya Pradesh in late sixties. The area of soybean increased tremendously in the state and presently its area has reached to such a level which is almost in static position. The area under soybean in Madhya Pradesh found to about 5298 thousand hectare with on average productivity of 10.40 quintal per hectare which is very low as compare to average productivity of other soybean growing countries. In order to overcome the problem of low yield, application of modern technology in soybean cultivation can play a crucial role. But due to certain constraints and low knowledge of soybean growers

regarding improved soybean production technology are major concerns. Keeping in the view of above fact, it is important to assess the knowledge level of soybean growers regarding improved Soybean production technology and the constraints confronting in the area.

MATERIAL AND METHODS

The study was conducted in Burhanpur district of Madhya Pradesh because soybean is important oilseed crop of this district and being grown in 14900 hectare of land. Eight Villages (4 from Burhanpur and 4 from Khaknar Block) were selected randomly for study. Out of the total farm families of each selected village, representative samples of 15 farmers were selected randomly for the study. Thus, a total of 120 farmers were considered in the sample for the collection of data.

Farmers were interviewed through personal interview technique with survey method. Knowledge index was worked out to assess the level of knowledge of each farmer with the help of following equation:

$$Ki = \frac{O}{S} \times 100$$

Where, Ki = Knowledge index of a farmer

O = Total score obtained by a farmer

S = Total obtainable score

RESULTS AND DISCUSSION

Knowledge about innovation/technology may be an important factor affecting the adoption behaviours of farmers. Bloom (1979) defines knowledge as “Those behaviours and test situations which emphasized the remembering by recognition or recall of ideas, materials of phenomenon”. Operationally knowledge was used in this study as actual knowledge of the farmers regarding soybean production technology. The extent of knowledge was analyzed regarding seed treatment, improved variety, fertilizer application, weed control and plant protection measures etc. The details of extent of knowledge regarding recommended soybean production technology of soybean growers are presented in Table 1.

In order to test the knowledge of the respondents, different question were put at the time of personal interview regarding seed treatment, improved variety, fertilizer use, weed control and plant protection measure for soybean crop. Majority of the respondent (55.01%) reported that they had low to medium level of knowledge about seed treatment practices. Whereas, 90.83 and 74.16 percent of respondents (had medium to high level of knowledge about improved soybean variety and plant protection measures, respectively.

Regarding use of fertilizer maximum respondents (79.17%) had high level of knowledge. While, majority of the respondents i.e. 65.01 percent were having low to medium level of knowledge about weed control. The extent of knowledge and knowledge gap of the respondent regarding selected five practices i.e. seed treatment, improved variety, fertilizer use, weed control and part protection measures are given in Table 2.

Majority of the farmers (61.95%) were having wide knowledge gap in seed treatment of soybean crop, whereas, least gap was reported in fertilizer application (10.56%) and improved variety (15.56%). The knowledge gap for the weed control and plant protection measures were 35.56 and 30.00 per cent, respectively. The overall knowledge gap of 30.73 per cent was recorded regarding different selected practices of soybean cultivation. As per the result cited above the major efforts should be made to reduce the gap in seed treatment, weed control and plant protection measures through a planned extension strategy with the help of trainings, demonstrations and other popular communication media among the respondents.

The constraints narrated by the farmers in respect to knowledge of recommended soybean production technology are presented in Table 3.

Table 1: Distribution of respondents according to extent of knowledge regarding recommended soybean production technology

Technologies	Extent of knowledge			
	Nil (00.00%)	Low (upto 33.33%)	Medium (33.34-66.66%)	High (Above 66.66%)
Seed Treatment	41(34.16)	34(28.34)	32(26.67)	13(10.83)
Improved Variety	0(0.00)	11(9.17)	34(28.33)	75(62.50)
Fertilizer use	2(1.66)	9(7.50)	14(11.67)	95(79.17)
Weed Control	2(1.66)	44(36.67)	34(28.34)	40(33.33)
Plant Protection Measure	17(14.17)	14(11.67)	29(24.16)	60(50.00)

Table 2: Overall knowledge and knowledge gap among the respondent about recommended soybean production technology

Technologies	Total obtainable score	Total obtained score	Knowledge percent	Knowledge gap in percent
Seed Treatment	360	137	38.05	61.95
Improved variety	360	304	84.44	15.56
Fertilizer use	360	322	89.44	10.56
Weed Control	360	232	64.44	35.56
Plant Protection measure	360	252	70.00	30.00
Overall Knowledge	1800	1247	69.27	30.73

Table 3 : Constraints faced by farmer in respect to knowledge of recommended soybean production technology

Constraints confronting	MPS*	Rank
Lack of education	67.72	IV
Lack of awareness	54.05	VII
Majored age	42.17	X
Large family	46.89	IX
Other business	36.83	XIII
Small land holding	59.61	VI
Low income	78.22	III
Lack of social motivation	40.44	XII
Friends area not adopt advance technology	32.94	XIV
Lack of social participation	47.66	VIII
Lack of risk bearing capacity	41.55	XI
Not availability of information (extension gap)	87.72	I
Lack of information in proper time	80.16	II
Not available of information media	65.61	V

*Mean per cent score.

The main constraints confronting by farmers in respect of knowledge about recommended soybean production technology found to be varied. The most important constraints were reported extension gap (by 87.72% of respondents) followed by lack of information in proper time (by 80.16%), low income (by 78.22%) , lack of education (by 67.72%) and not available of information media (65.61%), respectively. Therefore, in the light of above fact it could be suggested that strategic effort should be made to increase the level of knowledge of farmers in respect of improved soybean production technology though promising extension activities.

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Impact Assessment of Tribal Sub Plan (TSP) on Livelihood Security of the Beneficiaries in West Bengal

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ABSTRACT

The present study was conducted in Malbazar and Madarihaat blocks of Jalpaiguri district in West Bengal. For the purpose of study, a total of 120 respondents were interviewed including 60 male and 60 female respondents. Significant difference was found in food security, habitat security, occupational security, educational security, social security in before and after implementation of TSP. Whereas difference in health security and environmental security was found to be non significant for before after period. Environmental security was found to decrease over the time period. Considerable positive shift was also observed in livelihood categories of people over the time period.

Keywords: Livelihood security, Gender empowerment

INTRODUCTION

India is witnessing a series of changes in livelihood status of people since early nineties. Recently India ranked 94th out of 118 countries in the Global Hunger Index behind Ethiopia. There is always an interaction between the environment in which the community lives and their practices that led to sustain their livelihood. United Nations Conference on Environment and Development (1992) put forward the idea of sustainable livelihoods as an approach to maintain or enhance productivity; secure ownership of and access to resources and income generating activities as well as to ensure adequate and sustainable flows of food and cash to meet basic needs. But with the increasing trend of limited natural resource base surroundings, the tribal societies being scarce and through increasing intervention of outside people the most important livelihood aspects of tribes i.e. forest resources become destroyed through over exploitation of wood, fuel, grazing land and other resources. This ultimately results in poor livelihood status of tribes.

As Sainath (1996) says that "Seldom has policy been as forcefully implemented as in the 1990s. For ten years, governments have assaulted the livelihoods and food security of the disadvantaged groups. That security does not lie in mountains of grain but in millions of jobs and workdays for people". The concept of sustainable rural

livelihoods is central to debate about tribal development, poverty reduction and environmental management. It was a reflection of growing recognition that food security was not merely a problem of agricultural productivity, but was a problem of poverty in all multi dimensions and thus a focus on household food security with an emphasis on food access was initiated in the last decade.

So-called 'livelihoods approaches' work with people, supporting them to build upon their own strengths and realize their potential, while at the same time acknowledging the effects of policies and institutions, external shocks and trends. The aim is to do away with pre-conceptions about what exactly rural people are seeking and how they are most likely to achieve their goals, and to develop an accurate and dynamic picture of them in their environment. In this regard Diana Carney (1999) pointed out that "Livelihoods approaches have little to say about distributional issues, though there is an implicit assumption that the emphasis will be on the poorest. It will be important to ensure that this focus is maintained by the incorporating broader lessons about reaching the poor into livelihoods analysis." This provides the basis for identifying the constraints to livelihood development and poverty reduction. Such constraints can lie at local level or in the broader economic and policy environment. They may relate to

the agricultural sector – long the focus of donor activity in rural areas or they may be more to do with social conditions, health, education or rural infrastructure.

The participatory role of tribes in improving their own livelihood conditions by optimum utilization of natural endowments and alternative uses must find an appropriate place in the strategic approach. The social dynamics of tribal welfare and development is such that effective strategies to protect tribes and their livelihood imply negotiating some kind of social consensus about criteria concerning tribal development and values of the society that evolves from such programmes. This also implies a broad social consensus about the basic rights and opportunities that tribes should enjoy and the responsibilities that should be taken by different individual and social groups. In view of these facts and circumstances, the present study was conducted with an objective to analyze the impact of TSP in livelihood security of tribal.

MATERIAL AND METHODS

The study was conducted in the Jalpaiguri district of West Bengal where four villages viz., Batabari, Totopara, Santal danga and Tokatuli village were selected purposefully because of hundred per cent tribal population. Thirty respondents from each village were selected randomly as sample for the study. Among the thirty respondents fifteen male and fifteen female respondents were selected from each village for measuring gender empowerment. Thus a total of 120 farmers were interviewed using recall method and critical incident technique. *Before-after* design was applied to assess the impact of TSP towards livelihood security of the beneficiaries. In order to measure the livelihood security of the respondent’s household, a livelihood security index (LSI) developed by Abadi Teklehaimanot (2010) was used with required modifications. The components of the LSI were as follows:

Food Security: It was operationalized as the availability and access to balanced food at household level.

Income Security: It was operationalized as the access to regular and satisfied employment.

Habitat Security: It included housing with basic amenities.

Educational Security: It included the educational level of the family and access to educational facilities including higher education.

Health security: It included the health status of the family and access to health care facilities.

Social Security: It included social participation and social status of the family

The Maximum and Minimum Score Possible for each Component were as follows:

Components	Maximum score	Minimum score
Food security	12	4
Income security	8	4
Habitat security	12	6
Educational security	10	5
Health security	6	3
Social security	7	3

Abadi (2010) identified six different dimensions of livelihood security and weighted based on their perceived significance in determining the livelihood security of rural household. Household food security emerged as the most important dimensions, followed by income security, social security, health security, education security, habitat security, environmental security in their descending order of significance. Scale values of the components of LSI as suggested by Abadi (2010) are as follows.

Scale values of livelihood security components as suggested by Abadi (2010)

Components	Scale values
Food security	11.25
Income security	9.13
Habitat security	5.71
Educational security	6.54
Health security	7.13
Social security	7.13

The livelihood Security Index (LSI) for each respondent was calculated using the following formula:

$$LSI_i = \frac{\sum U_{ij} \cdot S_j \times 100}{\text{Total Scale Value}} \quad [i= 1-200, j= 1-7]$$

LSI_i= Livelihood Security Index of ith respondent

U_{ij}= Unit score of the ith respondent on jth component
 S_j= Scale value of the jth component
 Total scale value= 54.63

$$\text{Where } U_{ij} = \frac{Y_{ij} - \text{Min } y_j}{\text{Max } y_j - \text{Min } y_j}$$

U_{ij}= Unit score of the ith respondent on jth component
 Y_{ij}= Value of ith respondent on the jth component
 Max y_j = Maximum score on the jth component
 Min y_j= Minimum score on the jth component

RESULTS AND DISCUSSION

The mean score obtained by the respondents on the components of livelihood security index has been displayed in Table 1. From the table, it is evident that there was a change in the mean score for every components of livelihood security index for before TSP and after TSP.

Table 1: Mean score obtained by respondents on the components of livelihood security index before and after TSP N=120

Particulars	Before TSP	After TSP
Food Security	3.60	4.36
Income Security	2.13	5.14
Habitat Security	1.19	2.85
Educational Security	1.11	3.14
Health Security	1.99	2.00
Social Security	1.00	1.72

Mean score obtained by the respondents on food security before TSP was 3.6 and after TSP it became 4.36. Changes have occurred in the food habit of the respondents in the study area. Many traditional water bodies have been renovated under TSP and many of respondents practicing fisheries over there with technical guidance of TSP. The local residents consume it as well as they sell it to the market and get some extra income. With the supply of seedlings and guidance under TSP respondents in cultivation of fruit crops like mango, banana and plantation crops like coconut, areca nut etc had increased. According to the respondents, frequency of milk and poultry consumption was also increased after intervention of TSP in the study area (Fig. 1).

From the Figure 2 presented mean score obtained by the respondents on income security in before TSP was 2.13 and after TSP it became 5.14. Under TSP

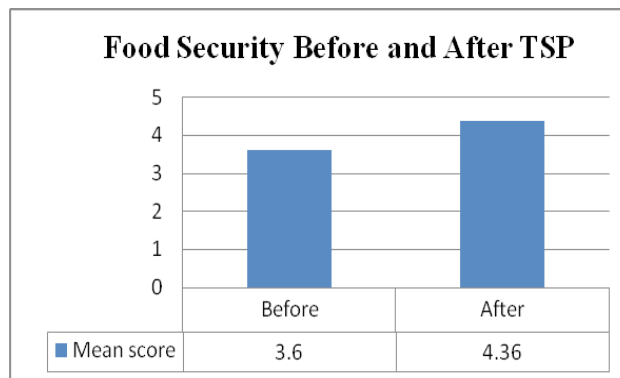


Fig. 1: Mean score obtained by respondents on food security before tsp and after TSP

intervention, people are getting vocational training in various areas which increased their job competency. Through credit, subsidy and technical guidance many beneficiaries had taken up self employment. Reforestation strategy under TSP increased the wage employment significantly.

Mean score obtained by the respondents on habitat security before TSP was 1.19 and after TSP it became 2.85. Pucca house with sanitary facilities increased with schemes under TSP. Availability of water supply to house also increased through building of well but electricity supply to household decreased mainly due to rise in electric charges. Main road connectivity through pucca road increased after TSP (Fig. 3).

Fig. 4 shown that mean score obtained by the respondents on educational security before TSP was 1.11 and after TSP it became 3.14. Increased allocations of funds to enhance level of literacy among tribal adivasi vidyalaya, tribal girls hostel, scholarship to ST candidates from secondary schooling up to higher education helped in enhancing their educational security on increasing rate.

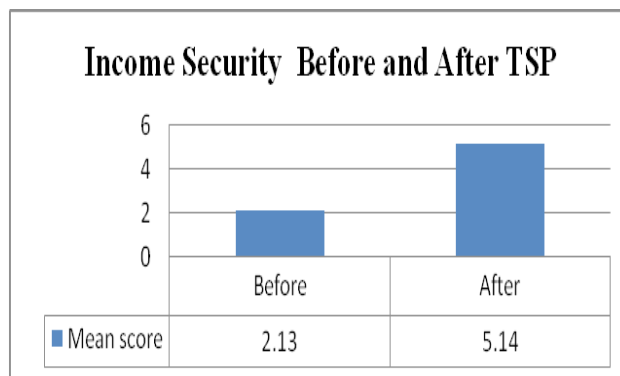


Fig. 2: Mean score obtained by respondents on income security before tsp and after TSP

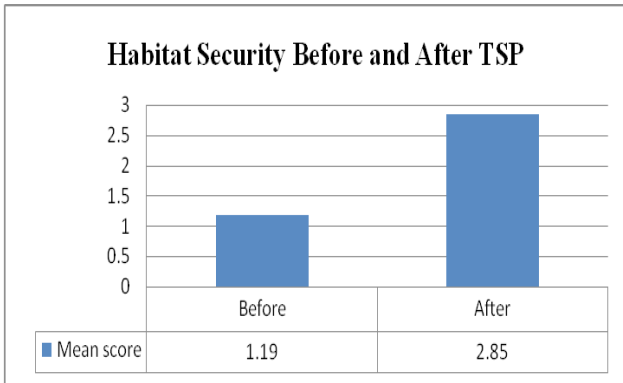


Fig. 3: Mean score obtained by respondents on habitat security before tsp and after TSP

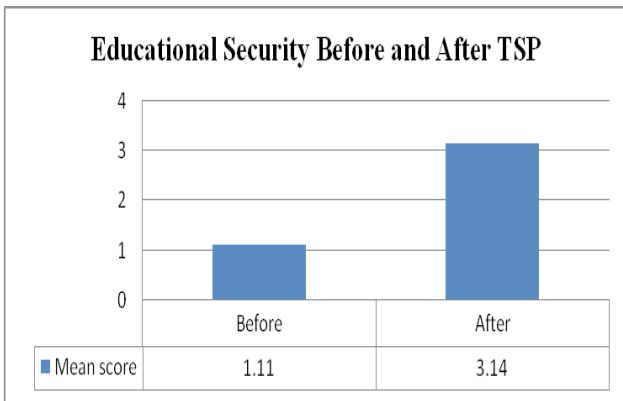


Fig. 4. Mean score obtained by respondents on educational security before and after TSP

Mean score obtained by the respondents on health security before TSP was 1.99 and after TSP it became 2.00. The basic health care facilities under TSP helped the tribal people a lot. Basic medication and first aid facilities can be availed from near the villages at health centre but well equipped hospital is far ahead till now (Fig. 5).

Fig. 6 displayed that mean score obtained by the respondents on social security before TSP was 1.00 and after TSP it became 1.72. Membership in self help group for employment generation increase respondents' social security to some extent but not much.

From the result displayed in the table 3 and from the Figures 1, 2, 3, 4 and 5 it is evident that, changes had occurred in food security, income security, habitat security, educational security, health security, social security and environmental security of the respondents after implementation of TSP. An attempt was made to assess the impact of TSP on the livelihood security of it's beneficiaries. Table 4 and Table 5 show the

distribution of the respondents on the livelihood security before and after implemetation of the programme.

From the result of the paired t-test it was found that, changes in the mean score of food security, income security, habitat security, educational and social security were statistically significant with 199 degrees of freedom and five percent level of significance as the calculated t-value of the above said components were more than the table value.

The changes in the mean score of health security and environmental security before and after TSP were found statistically insignificant with 199 degrees of freedom and five per cent level of significance as the calculated t-value of the above said two components were less than table value.

The result revealed that, the mean livelihood security index score for the respondents before TSP was 25.22 with a standard deviation of 12.09. The livelihood

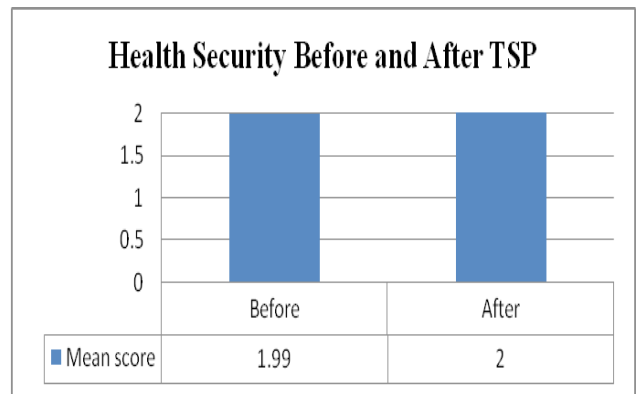


Fig. 5: Mean score obtained by respondents on health security before and after TSP

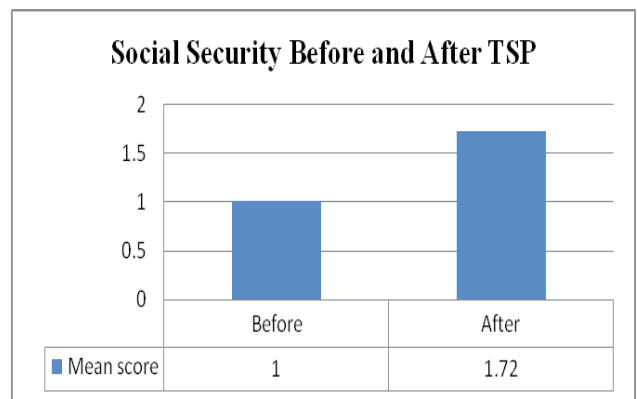


Fig. 6: Mean score obtained by respondents on social security before and after TSP

Table 2: Pair t- test value to test the significance of the mean difference of the components of livelihood security index before and after TSP (N=120)

Particulars	Paired difference		t-value (calculated)
	Mean	SD	
Food Security	.02188	.24718	3.969*
Income Security	.33894	.45923	8.051*
Habitat Security	.22727	.23274	10.742*
Educational Security	.35262	.26281	14.759*
Health Security	.00546	.32065	0.188 ^{NS}
Social Security	.12672	.30202	4.615*

*The difference is significant at 0.05 per cent level of significance; ^{NS}The difference is not significant

Table 3: Distribution of respondents on livelihood security before TSP (N=120)

Mean	25.2212
Standard deviation	12.09266
Range	51.52 to 60.75

Categories	Frequency	Percentage
Very Low (0-20)	37	31
Low (20-40)	73	61
Medium (40-60)	10	8
High (60-80)	0	0
Very High (80-100)	0	0
Total	120	100

Table 4: distribution of respondents on livelihood security after TSP (N=120)

Mean	38.24
Standard deviation	15.73
Range	62.81 to 74.16

Categories	Frequency	Percentage
Very Low (0-20)	7	6
Low (21-40)	57	47
Medium (41-60)	48	40
High (61-80)	8	7
Very High (81-100)	0	0
Total	120	100

security index score before implementation of TSP among tribals of Jalpaiguri district varied from a range of 51.52 to 60.75.

The mean livelihood security index score for the respondents before TSP among tribes of Jalpaiguri district was 38.2454 with a standard deviation of 15.73.

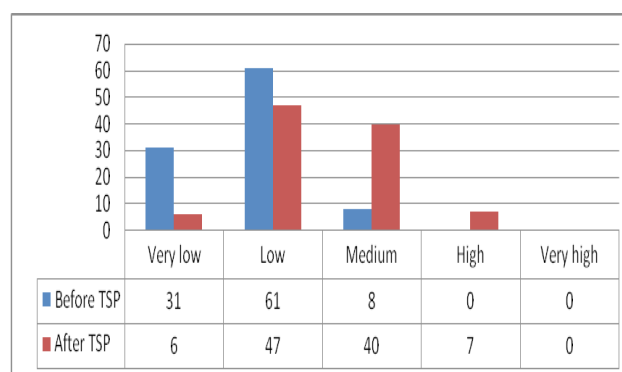


Fig. 7: Distribution of respondents on livelihood security in before and after TSP (N=120)

The livelihood security index score after the programme varied from a range of 62.81 to 74.16.

Changes had been found over livelihood security of the respondents before and after implementation of TSP programme. Majority of the respondents (61%) were found to be falling under low livelihood security category before implementation of TSP. But after its implementation the the percentage of low category livelihood security became decreasing and percent on medium (8-40%) and high (0-7%) livelihood security category became increasing.

Paired t-test was applied to find out whether the change in the livelihood security of the respondents for before and after TSP periods was statistically significant or not.

Table 5: Pair T-test value to test the significance of the mean difference of the livelihood security before and after TSP N=120

Particular	Paired difference		t-value (calculated)
	d	S ²	
Livelihood Security	7.75	1.2357	2.45

The result of the paired t-test shows that, the change in the livelihood security of the respondents before and after TSP implementation is statistically significant at five percent level of significance as the calculated t-value (2.45) exceeded the table value of t i.e. 1.94.

CONCLUSION

The study concluded that positive change had occurred among the respondents in terms of livelihood security after commencement of TSP in the study area. So it can

be said that TSP achieved one of its desired goals, that is enhancing livelihood security of the tribal people. But effort should be made to enhance it further specially in case of health and environmental security. Before commencement of TSP in the study area large number of people were found to be fallen under very low and low livelihood category. After commencement of the programme many of them reached to the medium and some of them reached to high livelihood level. Necessary effort should be taken so that the tribal people become more secure.

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Adoption of IPM by Cabbage and Cauliflower Growers in Manipur

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ABSTRACT

Vegetables are one of the important crops as it forms basis part of our diet and besides providing nutritional security, are also major source of income especially for small and marginal farmers. They are the important sources of minerals such as iron calcium and magnesium, vitamins like A, B-complex, C and fiber in the largely vegetarian diet of our people has created increasing the demand for vegetable. The study was conducted in Imphal East District of Manipur and the main purpose of this study was to investigate the adoption of integrated pest management practices by the vegetables growers of cabbage and cauliflower with respect to integrated pest managements practices. The study revealed that 60 per cent of the farmers were in medium adopter groups followed 20 per cent each by high and medium adopter group. Further, it also revealed that, relationship between socio-personal and psychological character of vegetables growers, the variable sex and economic motivation use exhibited positive signific, other variables namely, age, education, caste, occupation, family size, innovative proneness risk orientation and attitudes towards modern vegetables crops non-significantly related with adoption level of IPM practices of Cabbage and Cauliflower growers.

Key words: Integrated pest management, Adoption, Vegetable growers, Cabbage and cauliflower

INTRODUCTION

Our country has achieved self sufficiency and a good degree of stability of food production. This created an urgent need for providing health security to our population by supplying nutrition through balanced diet. The country is the world's largest producer of vegetables next only to China. However, our per capita consumption in India is 160 g per day per person as against recommendation of 280 g per day per person. Vegetables occupy a significant place in India's Economy next only to food grains in terms of acreage, production and value. There is a great challenge of producing 250 million tons by 2025. Further, our country has made quantum jump after independence scoring more than five times increase in vegetable production. However, the productivity of different vegetables is comparatively low in comparison with that of other developed countries. Among the different crops, vegetable cultivations is one of the most important which is considerable most attracted by Indian farmers as it is comparatively more remunerative than other field crops. The wider adaptability of

vegetables cultivation helps in increasing our economy and commerce status through export trade. So, they play a major important role in our economy.

Since, the origin of cultivation of pest and non insect's damage crops become unacceptable and to combat with this burning problem for the farmers Integrated Management Strategies of crop pest under Manipur is recommended. An insect pest problem is one of the important limiting factors in the profitable cultivation of agricultural crops. In India, including Manipur and most of the developing countries, insect pest control is mainly based on the use of insecticidal chemicals because on their quicker action, easy availability and giving spectacular result within a short time. So, the concept of Integrated Pest Management emerged.

MATERIALS AND METHODS

The study was conducted in purposively selected Imphal East District of Manipur. A total of five Gram Panchayat were randomly selected. Out of five Gram Panchayat, again five villages were selected from each

panchayat for the study. The selected villages were Basikhong Bamon Kampu, Kyamgei (mamang and maning leikai), Arapti (mamang and maning leikai), Urup and Uchekon Khounou. Proportionate random sampling procedure was used for selection of respondents from the selected villages. Eight per cent of the total population from each sampled village was selected as respondents for the study. Thus, nearly, 18,14,40,26 and 2 farmers were selected from Basikhong Bamon Kampu, Kyamgei (mamang and maning leikai), Arapti (mamang and maning leikai), Urup and Uchekon Khounou villages respectively. Finally a sample of 100 households was selected for the study. In this study adoption level refers to the adoption of recommended cultivation practices of cabbage and cauliflower by the respondents. The data were collected from the respondents through personal interview technique by using pre-tested schedule and were analyzed by using frequencies, simple percentages, mean, standard deviation and simple correlation. This was measured with the help of a structural schedule which was developed in consultation with the expert. The schedule consisted of 25 items from different aspect of IPM practices in cabbage and cauliflower like cultural practices, mechanical, biological and chemical control scoring on each items was done on a scale with 4 points continuum in terms of frequency with which the practice was followed and scores of assigned to the regular practitioner-3, 2 to less frequently practitioner. 1 to very less frequent practitioner and 0 (zero) to every non practitioners.

RESULTS AND DISCUSSION

The results of the study on socio-personal and psychological characteristics of the vegetables growers with adoption level of IPM are depicted in Table 1.

The majority of the farmers were in the age group of 36 to 50 respectively. Around (59%) of the respondents belonged old aged group, followed by middle aged (28%) and only (13%) aged had young group, the possible reasons might be that the old aged might have long experienced but young and middle aged people might have engaged in other occupations. These studies are in line with the study carried out by Pyasi *et al.* (2002), Kurana *et al.* (2004) and Leena *et al.* (2008).

Comparatively more number of respondents (88 %) belonged to male group followed by female (12%) of sex. The women who were engaged in agriculture are

almost widow and male are the head of the family, that why male are more in number and this favour the possible reason.

About (55%) of the respondents had graduated and high school followed by middle school (20%) primary school (5%) and can read and write (6%) respectively. But illiterates were observed to less adoption of IPM (14%). The increased importance of literacy and with the change in our society from traditional to modern one education is more formal, systematically organized and in the most modern societies, it is compulsory might be the reasons for favour the situation. The findings were supported by Ingle *et al.* (1998) and Leena *et al.* (2008).

Table 1: Distribution of farmers with respect to their socio-personal and psychological characteristics (N=100)

Variables	Categories	Frequency	%
Age	Young	13	13
	Middle age group	28	28
	Old age group	59	59
Sex	Male	88	88
	Female	12	12
Education	Illiterate	14	14
	Can read and write	6	6
	Primary school	5	5
	Middle school	20	20
	High school	25	25
Caste	Graduates	30	30
	Upper caste(general)	86	86
	Other backward castes	12	12
Occupation	Scheduled caste/ scheduled tribe	2	2
	Agriculture	69	69
	Service	5	5
	Agriculture/Service	19	19
Family type	Other occupation	7	7
	Nuclear	42	42
Innovation	Joint	58	58
	Low	31	31
Proneness	Medium	21	21
	High	48	48
Economic motivation	Low	17	17
	Medium	33	33
	High	50	50
Risk orientation	Low	15	15
	Medium	38	38
	High	47	47
Attitudes towards modern vegetables crops	Low	7	7
	Medium	34	34
	High	59	59

More than eighty per cent of respondents belonged to upper caste category and remaining twenty per cent is occupied by other backward caste and schedule tribe/ caste. This might be due to the fact that in that study areas most of the people belonged to upper caste and those some backward caste were migrated from other place. Approximately more than 70 per cent of the respondents had agriculture as their main occupation. The possible result might be that, in agriculture and allied service state more than seventy per cent of the people were engaged on agriculture and the findings is supported by the study of Karpagam (2000).

More than (58%) of the respondents belonged to joint family and remaining (42%) belonged to nuclear family. Their family might not be broken after marriage of their sons because of their low size of land holding favour the situation. The finding of Hanumanaikar (1995) was found to support the similar situation. The majority of the farmers 48 per cent had high access of innovation proneness followed by 31 per cent having low access of innovation, whereas only 21 per cent of farmers were having medium innovation proneness. The respondents thus comprised mostly to high prone farmers in innovation. It may, be therefore, be inferred that high and low category were more receptive to innovations than the medium category. This is because in general low and high category had small size of land so, that why adopt new farm practices to their farm operation to upgrade this economic status. The findings are contradictory with the observation of Kumar (1998) and Vijay (2001).

The high economic motivation was noticed among 50 per cent of respondents, followed by medium 33 per cent and only 17 per cent by the low category. The respondents thus, were mostly included in high category with regard to their economic motivation, thereby indicating that they had a strong desire towards economic developments, as result they might have got motivated to increase their economical returns. The result is in line with the finding of Siddappa (1999).

In the whole samples 47 per cent of the farmers belonged to high category of risk orientation, followed by medium category 38 per cent and only 15 per cent in case of low category. The respondents thus comprised mostly high risk farmers in adopting new agricultural practices. Similar results were noticed in the studies of Shashidhara (2003) and Raghavendra (2005). Majority of the farmers 59 per cent were having high attitudes towards modern vegetable followed by

medium 34 per cent and only 7 per cent by low category. It may, therefore, be inferred that all the category of the farmers was aware about the modern vegetable cultivation.

Adoption level of IPM: The Distribution of farmers according to on their adoption level of IPM of the farmers of cabbage and cauliflower are given below in Table 2.

The results show that 60 percent of the respondents had medium level of adoption behavior and remaining 20 percent each for both low and high. It depicts that majority of the respondents (80%) were found to possess in adopting level of IPM practices. The finding of the study is in line to the findings of Reddy (2000). The possible reasons might be that IPM is a new concept to the farmers and in adopting these techniques they might felt that this is very much tough and complex to practice. From these results, farmers need to be trained and educated about the IPM practices regarding its advantages and benefits for larger adoption by the farmers.

Table 2: Distribution of the cabbage and cauliflower growers according to their adoption level of IPM (N=100)

Adoption level of IPM practices	Frequency	Percentage
Low	20	20.00
Medium	60	60.00
High	20	20.00

$X =$ (Mean Score) = 52.27 $SD =$ (Standard deviation) = 7.57

Rational analysis of the selected dependent and independents variables of the vegetables growers:

The correlation and multiple correlations co-efficient of adoption level of IPM with socio-psychological characteristics of vegetables growers has been discussed below in Table 3 and 4.

The result given in the Table 3 indicates that the adoption level of IPM practices technology was found to be positively and significantly correlated with sex ($r=571^{**}$) and economic motivation ($r=232^{*}$). However the rest of the variables such as age, education, caste, occupation, family size, innovation proneness, risk orientation and attitudes towards modern vegetables crops were found to be positive but non-significantly correlated with the adoption level of IPM practices. It implies that they had strong desire toward economic

Table 3: Correlation between socio-personal and psychological characteristics and with the adoption level (correlation coefficient 'r') of IPM practices of cabbage and cauliflower grower

Variables	"r"
Age	.055NS
Sex	.571**
Education	.076NS
Caste	.012NS
Occupation	.027NS
Family size	.100NS
Innovation proneness	-.100NS
Economic Motivation	.232*
Risk orientation	-.059NS
Attitudes towards modern vegetable crops	.049NS

** Significant 0.01 level; *Significant 0.05 level

Table 4: Multiple Regression of the socio-personal and psychological characteristics of the vegetables growers with adoption of IPM practices

Independent variables	Regression coefficient (b _i)	Standard error (S.E) 'b'	't' value of 'b'
Age	0.018	0.72	0.253
Sex	7.499	1.703	4.403 **
Education	0.839	0.501	1.676 *
Caste	-1.636	1.302	-1.256
Occupation	1.335	0.639	2.089
Family size	-0.594	1.159	-5.12
Innovation proneness	-0.331	0.451	-0.734
Economic motivation	0.428	0.488	0.879
Risk orientation	-0.429	0.240	-1.037
Attitudes towards modern vegetables crops	0.328	0.521	0.630

R² = 0.56, F = 7.519, Intercept constant (b₀) = 15.984

Degree of freedom = 79

*Significant at 0.05 level **Significant at 0.01 level

development. This result is in line with the study of Nair (1969) and Sagar (1983).

To find out the extent of contribution of each of variables towards adoption level of IPM the multiple regression analysis was performed. The results are presented in Table 4. It can be depicted from the above table variables like sex and education had positively significantly correlated with adoption level of IPM practices technology at one and five per cent level of significance. But the variables like age, occupation, economic motivation and attitudes toward modern

vegetables crops were found to be positive but non-significantly correlated with the adoption level of IPM practices and the remaining caste, family sex and risk orientation were found to be negative and non-significantly correlated with the vegetables growers.

The results of the multiple regression analysis in Table 4 indicated that the contribution of 10 socio-psychological and the independents on the dependents was 65.6 percent as the value of R² was found to be 0.656 which was significant at 0.01 levels as evident from the corresponding F value. However it can be observed from the t values as showed in the Table 4 that out of 10 socio-personal and psychological factors only two namely, sex and education had significant influence from on the adoption level of IPM practices of cabbage and cauliflower growers. Thus, it means that these two variables had contributed significantly in the adoption level of IPM practices. The strength of contribution of these variables can be explained as one unit increases in sex and educational status would bring an increase of 1.703 and 0.501 units in adoption level respectively. The results are in line with the studies carried out by Baruah *et al* (1998) and Singh (2000).

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Socio-economic Impact of Mango Cultivation Promoted under Dry land Horticulture Programme

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ABSTRACT

This study was carried out with the objective to assess the impact of mango cultivation on socio-economic conditions of farmers. The study was carried out in the selected villages of Patur Panchayat Samiti of Akola district as Patur Panchayat Samiti has maximum number of mango growers. The findings revealed that majority of the mango growers were in middle-age group, having education upto high school level. Nearly equal proportion of mango grower were found in OBC, VJ/NT, SC and Open category, were possessing semi-medium type of land holding and having planted orchards in an area of 1.0 ha Majority of them were having experience of above 10 years in fruit plantation, having annual income in the range of Rs. 25,001/- to Rs. 50,000/- and were getting motivated by the staff of Department of Horticulture. The socio-economic impact of mango cultivation as studied on the dimensions of occupation, land holding, annual income, socio-political participation, material possession and employment generation were found to have change among the mango growers.

Keywords: Socio economic impact, Dry land horticulture, Mango cultivation

INTRODUCTION

Government of Maharashtra had launched a ambitious programme of "Horticultural Development" and being implemented through Employment Guarantee Scheme (EGS) in the year 1990-91. One of the major objectives of EGS is "to improve socio-economic conditions of the farmers and provide self employment opportunities to rural masses along with soil and water conservation. In Maharashtra about 85 percent of the total cultivable land comes under rainfed agriculture. This emphasizes the importance of dry land horticulture. The present status of Horticultural crops in the state is not encouraging. There is 29 lakh hectares area under cultivable waste, which needs to bring under cultivation of fruit crops. There is a wide scope of increasing fruit production. Keeping this view in sight, the Government of Maharashtra had launched a ambitious programme of "Horticultural Development" and being implemented through Employment Guarantee Scheme (EGS) in the year 1990-91. One of the major objectives of EGS is "to improve socio-economic conditions of the farmers and provide self employment opportunities to rural masses along with soil and water conservation.

In this context, the present study has been undertaken to assess the impact of mango cultivation on socio-economic conditions of farmers.

MATERIAL AND METHODS

The present investigation was carried out in the selected villages of Patur Panchayat samiti of Akola district as Patur Panchayat Samiti has maximum number of mango growers. An exploratory design of social research was used in the present investigation and the study aimed to find out total socio-economic impact of dry land horticulture programme on the farmers. A list of mango growers was obtained from Taluka Agriculture Office, Patur. From the list, only 12 villages were purposively selected on the basis of maximum number of mango growers. Thus, the total 60 mango growers were selected purposively. A structural interview schedule was prepared and used for data collection. In accordance with the objectives of the study questions were framed in the schedule. The respondents were contacted at farm and home and the information in the interview schedule was collected. Thus the information obtained from 60 respondents were taken for analysis.

RESULTS AND DISCUSSION

The detail research findings with all relevant data have been furnished herewith.

The data with respect to various characteristics of the respondents have been furnished in Table 1. It is seen that more than fifty percent of the mango growers (53.33%) belong to middle age group i.e. 36 to 50 year, followed by 30.00 percent mango growers in the age group of above 50 years and about 16.67 percent of the mango growers were found to be younger (Upto 35 years) age category. The literacy position of the respondents revealed that about higher percentage of them (51.67%) have attended high school for acquisition of knowledge. The mango growers having primary and middle level education were 21.67 percent and 8.33 percent, respectively and only 18.33 percent having education at the college level. Whereas the distribution of mango growers on the basis of caste, it was found that about 25.00 per cent respondents were in the OBC category and nearly equal percent of the respondents (23.33%) appeared in the SC and VJ/NT category, followed by 21.67 percent in Open category and only 6.67 per cent in ST category. In case of land holding it was revealed that exactly 50.00 per cent were possessing 2.01 to 4.00 ha of land for cultivation of crops, followed by 36.67 per cent possessing upto 2.00 ha of land, and 13.33 per cent possessing medium level of land holding (4.01 to 10.00 ha) and no one was found below 1.00 ha of land holding.

Regarding area under mango plantation, it was found that the majority of mango growers (90.00%) planted mango in the area of 0.6 to 1.00 ha and only 10.00 per cent mango growers planted the mango in more than 1.00 ha area. In case of experience in fruit plantation majority of the mango growers (86.67%) were found to have above 10 years of experience in fruit plantation. This has indicated that these farmers have started the mango cultivation after the starting of Dry Land Horticulture Programme.

The distribution of mango growers according to their annual income indicated that near about 50.00 per cent of the mango growers (48.33%) had their annual income in category ranging from Rs. 25,001 to Rs. 50,000/-, followed by more than one fourth (28.34%) mango growers having their annual income upto Rs. 25,000 and 23.33 per cent having annual income above Rs. 50,000/- per annum. Regarding the sources of motivation for plantation of mango orchards it was found that higher percentage of mango growers planted

Table 1: Distribution of respondents according to their characteristics (n = 60)

Category	Respondents	
	Number	Percent
Age (years)		
Young (Upto 35)	10	16.67
Middle (36 to 50)	32	53.33
Old (Above 50)	18	30.00
Education		
Primary school (Upto 4 th)	13	21.67
Middle school (5 th to 7 th)	05	08.33
High School (8 th to 10 th)	31	51.67
College (Above 11 th)	11	18.33
Caste		
SC	14	23.33
ST	04	06.67
VJ/NT	14	23.33
OBC	15	25.00
Open	13	21.67
Land holding		
Marginal (upto 1.00 ha)	00	00.00
Small (1.01 to 2.00 ha)	22	36.67
Semi medium (2.01 to 4.00 ha)	30	50.00
Medium (4.01 to 10.00 ha)	08	13.33
Area under mango plantation		
Upto 0.5 ha	00	00.00
0.6 to 1 ha	54	90.00
1.01 and above	06	10.00
Experience in fruit plantation		
Upto 5 years	00	00.00
6 to 10 years	08	13.33
Above 10 years	52	86.67
Annual income		
Upto Rs. 25,000	17	28.34
Rs. 25,001 to Rs. 50,000	29	48.33
Rs. 50,001 and above	14	23.33
Source of motivation		
Staff of Horticulture Department	34	56.67
Staff of Soil and Water Conservation	16	26.67
Staff of Panchayat	10	16.66

their orchards by getting them motivated through the staff of Horticulture Department 56.67 per cent. It was followed by 26.67 per cent motivated by the staff of soil and water conservation and only 16.66 per cent were motivated by the staff of Panchayat Samiti. On perusal of data in Table 2, it may be noted that prior to plantation of mango orchards 93.33 per cent of respondents had agriculture as their main occupation, followed by 5.00 per cent of respondents as agricultural and allied and only meager 1.67 per cent as agriculture and service were found having subsidiary occupation. After the plantation of mango orchards the main occupation of majority of the respondents was reduced

to 78.33 per cent from 93.33 per cent, however their subsidiary occupation was found to be increased. It could be inferred that, the dependence on the agriculture as the main occupation was reduced down during the period of last 10 years. The mean of occupation score of after plantation was (1.28) observed to be more than that of before plantation of mango plants (1.88). In case of land holding, before and after the plantation of mango orchards, it could be seen that majority of respondents 65.00 per cent and 71.67 per cent in both the categories were found in semi-medium

Table 2: Distribution of respondents on dimensions of socio-economic impact of mango cultivation (n=60)

Dimension of SEI	Before		After	
	No.	%	No.	%
Occupation				
a) Agriculture	56	93.33	47	78.33
b) Agriculture + Allied	03	05.00	09	15.00
c) Agriculture + Service	01	01.67	04	06.67
Mean	1.08		1.28	
SD	0.33		0.58	
Land holding				
a) Marginal (Upto 1 ha)	00	00.00	00	00.00
b) Small (1.01 to 2 ha)	15	25.00	09	15.00
c) Semi-medium (2.01 to 4 ha)	39	65.00	43	71.67
d) Medium (4.01 to 10 ha)	06	10.00	08	13.33
Mean	7.30		7.33	
SD	2.98		3.01	
Annual income				
a) Upto Rs. 25,000	25	41.67	17	28.34
b) Rs. 25,001 to Rs. 50,000	23	38.33	29	48.33
c) Rs. 50,001 and above	12	20.00	14	23.33
Mean	32850		43983	
SD	22807		31195	
Socio-political participation				
a) Low	18	30.00	12	20.00
b) Medium	34	56.67	30	50.00
c) High	08	13.33	18	30.00
Mean	1.47		2.10	
SD	0.77		0.99	
Material possession				
a) Average	22	36.66	12	20.00
b) Moderate	28	46.67	34	56.66
c) Good	10	16.67	14	23.34
Mean	4.73		8.35	
SD	2.65		4.78	
Employment generation				
a) Upto 3 labour	43	71.67	35	58.33
b) 4 to 6 labour	17	28.33	18	30.00
c) 7 and above	00	00.00	07	11.67
Mean	3.00		3.78	
SD	1.52		1.88	

category, followed by small (25.00% and 15.00%) and medium farmers (10.00% and 13.33%) in both the category before and after, respectively. The mean land holding of after category (7.33%) was observed to be slightly more than before category (7.30%) due to slight increase in the land holding.

The distribution of the respondents according to their annual income in both the categories, it indicated that 41.67 percent of respondents in before category had their annual income upto Rs. 25,000/-, followed by 38.33 per cent in category ranging from Rs. 25,001 to Rs. 50,000/- and only 20.00 per cent were found to be having more than Rs. 50,000/- annual income per annum. In contrast to this, nearly fifty per cent respondents were found in category ranging from Rs. 25,001 to Rs. 50,000/-, followed by the category upto Rs. 25,000/- (28.34) and 23.33 per cent respondents belonged to the category of above Rs. 50,000/- annual income per annum.

It is inferred that majority of the respondents before plantation of mango orchards were found having their annual income upto Rs. 25,000/- and after the plantation of mango orchards maximum number of respondents appeared in the category ranging from Rs. 25,001 to Rs. 50,000/-. The mean annual income (43983) after plantation was found to be higher than mean annual income (32850) before plantation. The data with regards to the distribution of respondents according to socio-political participation have been presented in Table 2. Majority of the respondents before plantation of mango orchards were found in the medium level of socio-political participation (56.67%) followed by low level of socio-political participation (30.00%) and only 13.33 per cent were found in high socio-political participation category. In case of after plantation exactly 50.00 per cent respondents were found to be in medium socio-political participation, followed by high and low socio-political participation category of mango growers (30.00% and 20.00%) respectively. The mean score of socio-political participation after the plantation was (2.10) higher than that of before plantation (1.47) of orchards. The data with regards to the distribution of respondents according to change in material possession have been presented in Table 2. It is observed that majority of mango growers (46.67%) before plantation were in moderate level of material possession, followed by 36.66 per cent possessing average level and only 16.67 per cent farmers were in good level of material possession.

At present, the percentage of mango growers in moderate and good level of material possession were found to be increased i.e. 56.66 per cent and 23.34 per cent, respectively. Only 20.00 per cent were found in average level of material possession. The mean material possession score of mango growers in after category (8.35) was higher than the mean of before (4.75) category. The data with regards to the distribution of respondents according to employment generation have been presented in Table 2. It could be seen from the Table that before plantation of orchard (71.67%) of mango growers provide employment to 1 to 3 labour during the period of four months, followed by 28.33 percent mango growers that provide additional employment for 4 to 6 labour for a span of 8 months. However no mango growers observed providing additional employment to more than seven labours during a period of one year. At present, 58.33 per cent of mango growers were found providing additional employment to 1 to 3 labour during the period of four months, followed by 30.00 per cent of mango growers providing additional employment to 4 to 6 labour for a period of 8 months and 11.67 per cent providing additional employment to more than seven labours for a period of one year. The present mean employment generation score (3.78) was higher than that of before plantation (3.00) of orchards.

The socio-economic impact of mango cultivation on mango growers has been studied in terms of change in occupation, land holding, annual income, socio-political participation, material possession and employment generation measured in terms of percent change. The data thus obtained have been furnished in Table 3. A cursory look at Table 3 reveals that mean of occupation (1.28), land holding (7.33), annual income (43983), socio-political participation (2.10), material possession (8.35) and employment generation (3.78) of the mango growers after plantation of orchards were higher than the mean of occupation (1.08), land holding (7.30) annual income (32, 850), socio-political participation (1.47), material possession (4.73) and employment generation (3.00) of mango growers before plantation of orchards. It was also found that there was a change in occupation, land holding, annual income, socio-political participation, material possession and employment generation to the tune of 18.5, 0.46, 33.89, 43.18, 76.41 and 30.46 per cent over that of before plantation of mango orchards. Thus, it could be stated that although there were high rate of mortality

Table 3: Socio-economic impact of mango cultivation on mango growers

Impact dimension	Before	After	%
Occupation	1.08	1.28	18.5
Land holding	7.30	7.33	0.46
Annual income	32850	43983	33.89
Socio-political participation	1.47	2.10	43.18
Material possession	4.73	8.35	76.41
Employment generation	3.00	3.78	30.46
Mean total impact			33.81

percentage of mango plantation, it still has created a socio-economic impact on the mango growers.

When impact as a whole was considered, it is evident from Table 3 that there was socio-economic impact at 33.81 per cent of mango cultivation on the mango growers. It could, therefore be stated that there was definite impact of mango cultivation on the mango growers in terms of change in occupation, land holding, annual income, socio-political participation, material possession and employment generation to the extent of 33.81 per cent over and above as a whole. Similar finding was reported by Vidya Tayde *et al.* (2003).

CONCLUSION

From the study, it could be concluded that majority of the mango growers were observed in middle age group, having education upto high school level. Nearly equal proportion of mango grower were found in OBC, VJ/NT, SC and Open category, were possessing semi-medium type of land holding and having planted orchards in an area of 1.0 ha Majority of them were having experience of above 10 years in fruit plantation, having annual income in the range of Rs. 25,001/- to Rs. 50,000/- and were getting motivated by the staff of Department of Horticulture. The socio-economic impact of mango cultivation as studied on the dimensions of occupation, land holding, annual income, socio-political participation, material possession and employment generation were found to have change among the mango growers.

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Study on Problems Faced By the Artisans of Jammu Region

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ABSTRACT

Crafts particularly provide employment to the second largest number of people, an important part of Indian economy after the agriculture. This study was conducted to know the problems faced by the artisans of the Jammu region (J&K). A sample comprised of 80 artisans including 20 sculptor, 20 weavers, 20 potters & 20 embroidery workers from the two selected districts of Jammu province i.e. Udhampur & Jammu were selected. Results showed that majority (93%) of the artisan face problems related to lack of the finance, 84% responded lack of demand of their products in the market, as their products have failed to compete with most of the Chinese products in the market. About 41% of artisans are facing problems related to lack of training for innovation and marketing of their products and 37.5% responded that they have no networking with the marketers. The illiterate artisans who fail to deal with the modern marketing system take the help of middlemen who pay them very less than the market price. It further deteriorated their status and living conditions. To make the craft products nationally and internationally reknown and commercially viable, it is necessary to upgrade the skill of the artisans who should be supplied with quality raw material and financial assistance and connecting them to the national and international markets.

Keywords: Artisans, Potter, Embroider, Weaver and sculptor

INTRODUCTION

In the current Global setting, micro producers and artisans face the loss of their traditional markets because of weakening of their backward and forward linkages. The gradual shift of the local market to national and international market without proper support from Business Development Services (BDS) for designs, market intelligence and access to raw material has resulted in demand and supply. Producers are therefore forced to sell their products at distressed prices. The current crisis faced by the craft sector threatens the livelihood of millions of people, a large portion of who live in poverty. The globalization process of the 1990's further reinforced the conviction that it was necessary to have sustainable intervention in the lives of these artisans. There are more than 1000 artisan clusters in India. The major problem of these clusters is their isolation from the transmission process of marketing. Hitherto, the government machinery took the lead in the marketing of their products through different co-operative societies. However, in the absence of social capital among the artisans, the cooperatives were monopolized by a selected few in the communities. The trickle down effects of such efforts failed to take root.

As a result, the vulnerability of already marginalized communities increased (Singh, 2003).

Handlooms and Handicrafts of Kullu Manali (2001) in its report "Handicrafts: The Status" reported that people involved in handloom weaving monthly earn from Rs. 1500 to 3300. There are about 20,000 to 22,000 weavers in Kullu district of which 50% to 60% are regular weavers. The rest weave independently at home. The main problem faced by the industry are the marketing of the products as there is no definite organization or co-operative society occupied in supporting artisan in promoting their products. Another problem faced by the artisan is related to finance and raw material, as the rural artisan are poor and unable to arrange the required investment and the non-availability of raw material at suitable time and in ample quantity and quality further deteriorate their status.

Jena (2007) carried out a study "Orrisan Handicraft in the age of globalization: challenges and opportunities revealed that the Orrisan handicraft industry facing enormous problems. As there has been the evolution of the modern system economy, the artisans have lost their hold over the old patron-client market network. In the globalization time, though with their products

going global and increasing demand for it, still the artisans have been increasingly dependent on middle men like petty merchants, capitalists who pay the artisans in wage on piece rate bases. The government's initiative to create cooperatives has not become much successful. A survey revealed that over 25 lakh craft persons in India, based mostly in villages who are not used to interaction with buyers and do not have the necessary skills to safeguard their own interests. Illiteracy often makes them more vulnerable. Another problem that the Orrisan craft have failed to compete with Chinese companies who have intruded into the Orrisan market with their low cost products. Illiterate artisans also failing to deal with the modern market system, take the help of the middle men who pocket the actual surplus. As a result the artisans gradually become poorer though their products become highly demanding in both home and international markets.

Today, globalization is a reality and has the potential to open and provide new opportunities at a much wider scale, but the challenge before us in India lies in making globalization work in manner that enables us to achieve our twin objective of growth and equity. The growth doesn't just mean the percentage increase in GDP. The real content and elements of growth have to be inclusive of increase in employment opportunities and economic uplift of all sections of society. The organized sector constitutes 93% of the total work force in the country. We have to ensure that the process of globalization works for their welfare. We have millions of weavers and artisans having unique traditional skills and it is critically important to safeguard and protect them from high technology driven large scale mechanized production. The State of J&K in many respects has problem of isolation, backward and inaccessible areas and lack of industrial base and employment opportunities. The traditional industries like handloom and handicrafts hold considerable promise for economic empowerment and provide gainful employment to emaciated poor in the rural non-farm sector. But due to Globalization, Liberalization and technology based production affects the growth of the artisan in a least industrialized and poor state like J&K. All these have generated many negative and intended effects on the rural traditional crafts of the state, particularly the artisans like weavers, embroidery workers, potters, sculptures etc has been a major victims of market led growth. Hence the present study was taken up with the objective to know the problems faced by the Artisans of Jammu region.

MATERIAL AND METHODS

A pilot study was conducted to know the location of artisans cluster. Two districts of Jammu province i.e. Udhampur and Jammu were selected purposively as the artisans were mostly based on these two districts. Structured interview schedule was framed and tested on 10% of the sample to check the validity and reliability of the tool. The sample of 80 artisans was drawn from the selected villages through snowball sampling technique i.e. 20 potters, 20 weavers, 20 embroidery workers, and 20 sculptors. Both local and migrant artisan men who had one of the livelihood as artisan were selected. Data was collected through home visits. For in-depth analysis of artisans, case study of two artisans was reviewed.

RESULTS AND DISCUSSIONS

Mohd. Iqbal Parray, 26 yrs old is an embroidery worker migrant from Srinagar now residing in Ustaad mohalla, Jammu. He joined this occupation with his father at the age of 16 and still in occupation for the last 10 years. Iqbal has passed Hr. Secondary. He lives in Joint family with his parents, brother and a sister. His brother is a sub editor and sister is studying in graduation II year. His income varies according to the season but he earns above Rs.15000 per month. He has his own residential house in Jammu as well as in Srinagar and 1 sale shop and a workshop in Pacca Danga, Jammu.

Work pattern: Mohd. Iqbal has his family occupation and continuing his own enterprise. He gets monetary benefit according to the sale. He is satisfied with his earning and wants to make more changes due to customer demand and to get more monetary benefit. He has brought many changes in his work pattern over a period of time and used different colors of thread and different designs/ motifs in the embroidery Shawls, Suites etc as per the demands of the consumer. He enjoys his work because of his interest. He earns good income from the occupation and able to manage family needs as his business is growing day by day. He gets help from his two workers whom he pays wages. Iqbal wants to continue the occupation for life time as he expressed that this is his family occupation and has sentiments attached to it, moreover he is earning a good handsome amount out of it.

Iqbal does not face any problem in his work as he has proper infrastructure for manufacturing of the products, he has earned a name in the market. He has

networking with other marketers and has demand of products in home as well as in the international market. He uses many innovations in his work to produce quality products and latest designs for consumer to earn more profit. He said soon he will open another sale unit at Gandhi Nagar to expand his business.

Sh. Mushtaq Ahmed aged 39 yrs is a local weaver, residing in Distt. Udhampur village Badola, also indulged in agricultural activities like threshing of the crop. At the age of 19 he started this occupation with his father and still continuing it from the last 20 years. His educational qualification is under matric .He belongs to a joint family and has parents, grandmother, two brother, wife and three children. His both brothers are married and work as driver, each earn Rs. 2000 per month. His income varies according to the demand and earns approximately 2000-2500 per month from both the occupation. In the name of assets he has only 1 kanal land and a residential kuchha house.

Work pattern of the Artisan: Sh. Mushtaq Ahmed is working as an artisan, gets monetary benefit of Rs.100 per blanket and weaves only 5-6 blankets in one month because of less demand as other machinery products of good quality are available in the market. Only the tribal and local people buy his blanket because of low cost. Due to less demand Mushtaq is not satisfied with his earning. He doesn't want to make any changes as he is not aware about latest trends and moreover the preference for traditional and handmade products is still there. He has not made any changes in his work over a period of time. He doesn't have other similar artisans in the locality as this occupation is declining day by day and non other wants to continue this occupation due to less demand and have shifted to other occupation. He is not able to manage family needs but somehow get some income from agriculture activities. He gets help in his work regularly from his mother and wife. He doesn't enjoy his work because he find it very hectic and is not able to earn enough money even to meet

basic needs. He doesn't want to continue the occupation for life time and nor want to encourage his children to adopt this.

Problems faced in the work: The problems he faces in his work include less demand of the products, lack of finance and no networking with the marketers. He thinks that the reasons for less demand is availability of machine made products in the market which are equipped with both quality and quantity at a very low price and the handmade blankets are not able to compete with the machinery products. But even with less demand he is still in the occupation as he doesn't know any other skill and has no other opportunity for earning. He want to get any training for producing the products which is in demand like mushroom farming, squash making, pickle making etc but do not have money to get any such training from outside. He cannot leave his place to get the training as he is the only bread earner of the family. He has financial problem also because of less demand of the products and even do not get good price because of outdated products. He doesn't get any support from govt./non-govt. agencies. He has no networking with the marketers and sells his products by himself because his products do not compete with market products and he makes them only on demand and sells with-in the area.

Table 1 shows the problems faced by local artisans. Majority (93.8%) revealed that they face problem related to lack of finance, 84% respondent said that there is lack of demand of the products. About 41.3% were facing problem related to lack of training for innovation and marketing of their products, 37.5% responded that they have no networking with the marketers, 28.8% mentioned need of proper infrastructure and 26.2% were facing problem of migration from their native place. A similar study conducted by Bellomine (2008) reported that the problems of artisans in Morocco includes financial support for the artisan, transportation, problems with raw material, lack of adequate training

Table 1: Problems faced by the Artisans* (N = 80)

Migration		Lack of demand of the products		Lack of finance		Lack of infrastructure		Lack of technology and tools		Lack of training for innovation & marketing		No networking with the marketers	
N	%	N	%	N	%	N	%	N	%	N	%	N	%
21	26.2	67	84	75	93.8	23	28.8	29	36.3	33	41.3	30	37.5

*Multiple responses

Table 2: Reasons of Migration and Management of work at new place (N = 80)

Reasons of Migration		Management at new place				If yes, *			
Less opportunity available for sale		Yes		No		Good opportunities for sale		Good price	
N	%	N	%	N	%	N	%	N	%
21	26.3	5	6.3	16	20	5	6.3	3	3.8

*Multiple responses

for modern commerce, lack of innovation and lack of motivation for the new generation were the main problem faced by the artisans. Table 2 depicts that 26.3% of the respondents were migrated from their native place due to less opportunity available for sale. Those artisans who had migrated to other places among them 6.3% were able to manage work at new place as they found good opportunities for sale, hence enhancement of profit. 3.8% were getting good price for their products whereas 20% of the artisans had difficulty to manage their work at new place because of the competitive market.

Table 3 reveals that majority (83.8%) of the artisans faced problem of less demand of their products. Out of which 65% gave reason that similar products of machine made are available at low cost, 63.8% opined that the other quality products replace the demand of traditional products as handmade products not able to compete with machine made products in productivity, hence cost for the item is more and demand is less, 36.3% explained that they do not have latest technology so were not able to produce quality products, 22.5% gave reason that consumer have no interest in handmade products as machine made products are available and at cheaper rates.

Majority (60%) of the artisan forcibly had to remain in the same occupation even if there is less

demand and the reason behind that they did not have other skill or other opportunity for income, whereas 23.8% want to change the occupation as they were indulged in agriculture or day to day labor work where they get wages at the end of the day and feel good about it, atleast have some income for the day. Ganguly (2006) also revealed in his study that the illegal import of cheap machine made Chinese silk yarn began the demand and supply for hand woven silk has dropped to a level. Similarly cocoon markets have experienced a serious decline with the dumping of huge quantities of Chinese silk. This makes the fabric available at considerably lower price. It also indicates that the liberalization of trade has been a boom for industrialist or smugglers but there is a loss of income for many artisans in west Bengal and massive loss jobs for the workers in organized production. Jena 2007 also reported in his study that the main problems faced by Orrisan artisans that the Orrisan craft have failed to compete with Chinese companies who have intruded into the Orrison market with their low cost products.

Table 4 reveals that 36.3% of the respondents were in opinion that the use of latest technology enhances their products quality, 23.8% opined that the use of different raw material and innovative things enhance the quality and 25% believed that they want to improve their own skill to make the changes in the product as per demand. Majority (63.8%) of the artisans revealed

Table 3: Less demand of the products (N = 80)

Less demand		Reason for less demand *								What you do if there is less demand			
		Non-availability of latest technology		Other quality products available		Similar products at low cost		No interest in hand-made products		Want to change the occupation		Remains in the same	
N	%	N	%	N	%	N	%	N	%	N	%	N	%
67	83.8	29	36.3	51	63.8	52	65	18	22.5	19	23.8	48	60

*Multiple responses

Table 4: Innovation/changes in the products (N=80)

Types of Changes*						Need for training for producing quality products							
Use of new technology		Use of new material and innovation		Improvement in skills		Yes		No		If yes, resources required*			
										Time		Money	
N	%	N	%	N	%	N	%	N	%	N	%	N	%
29	36.3	19	23.8	20	25	51	63.8	16	20	24	30	49	61.3

*Multiple responses

the need for training for producing quality products. Among them 61.3% need money to get training and 30% said that there is no time to get training unless there is any helping hand. Whereas 20% were not in favour of getting training from outside because they were the only member in the occupation, hence feel what for the training is needed if there is no one to follow the occupation. Padmnabhan (2004) also reported in his study that the artisan of west Bengal (Baishnabchak Bisan shilpa samabay Samity-a cooperative of the artisan) is still not ready to export on their own. Proper training on design and production techniques is said to be an immediate requirements of the cluster.

From the Table 5 it is clear that 36.3% of the respondents have financial problems in their work and gave reason behind that they were not getting good price for the products as broker often pocket the actual

surplus, 43.8% of respondents were not able to produce in quantity hence their profit rate was less, 47.5% responded that the occupation is a seasonal job and get meager profit for seasonal products e.g potters and weavers. Majority (72.5%) respondent were not getting any support from govt. /non govt. agencies, 27.5% of them agreed that Govt. provided help in the form of training or getting work, among them 25% of sculptors got opportunities for income from J&K Archeological department whereas as only 2.5% of weavers got training from the Handloom and Handicraft department to enhance their skill.

A study conducted by Jena (2007) revealed that the artisans faced problem even though their products going global and increasing demand for it, still the artisans have been increasingly dependent on middle men like petty merchants, capitalists who pay the artisans in wage on piece rate bases. Illiterate artisan also

Table 5: Percentage Responses about Financial Problem (N=80)

Reasons for problem regarding finance*			Support from Govt./NGO's				
Not getting good price for the products	Don't produce in quantity, hence profit rate less	It is a seasonal job	Yes	No	If yes, What		
					Training facilities by Govt.	Providing opportunity for income	
86.3%	43.8	47.5	27.5	72.5	2.5	25	

*Multiple responses

Table 6: Non-availability of latest technology and tools (N=80)

If yes, why not in use				If yes, how to buy				Perception towards the importance of knowledge regarding*					
Non-availability of new tech.		Lack of money		Own savings		Loan		Latest tech.		Market trend		Networking	
N	%	N	%	N	%	N	%	N	%	N	%	N	%
29	36.3	21	26.3	27	33.8	2	2.5	20	25	20	25	8	10

*Multiple Responses

failing to deal with the modern market system takes the help of the middle men who pocket the actual surplus. As a result the artisans gradually become poorer though their products become highly demanding in both home and international market. Handloom and Handicraft of Kullu Manali (2001) also revealed the problem of artisan related to finance and raw material as the rural artisan are poor and are unable to arrange the required investment and the non-availability of raw material at suitable time and in ample quantity and quality further deteriorate their status.

Table 6 reveals that 36.3% were not using latest technology because of non- availability of latest technology for their skill and 26.3% due to lack of money. The artisans revealed because of lack of finance, they had to buy from loan money that too from money lender as they are not given loan from the banks because so many formalities to be fulfilled for the loan. Though few percentage (25%) had perception about acquiring the knowledge regarding latest technology and market trend, whereas only 10% gave importance to have knowledge regarding networking for the marketing of the products. The overall picture reveals that artisans are in helpless position, can't afford to introduce technology in their occupation and are debarred from manufacturing the quality products as per the demand of the market. Office of the development commissioner (handicrafts) (2004) in its report on Kolhapur craft also revealed the problems faced by artisans to make the product for commercial purpose, as the artisans practice this craft for their own use. Also this crafts suffers from

its inherent characterization of low technology and high cost of production due to slow process.

Table 7 depicts that 32.5% sold their products by themselves whereas 67.5% sold through agents/broker, 37.5% have no networking with marketers, Among them 25% reasoned that marketers pay them very less than the market price/actual price whereas 15% said that brokers takes commission to sale their products. Those artisans who sell their products themselves had less sale than the other artisans. Planning Commission Govt. of India (2006) also reported that the tribal of Rajasthan, Uttaranchal and Andhra Pradesh were unable to receive the labor cost involved in preparing the craft and in the absence of assured market all tribal sells their product in the weekly "Haats" or exhibitions held at important cities. The findings revealed that they do not get good profit of their products.

Table 8 reveals that majority (78.8%) of the artisans were getting monetary benefit monthly whereas 21.3% were getting according to the work done. Majority (97.5%) were not satisfied with their earning whereas only 2.5% of embroidery worker were satisfied with the earning as they have upgraded their products as per the market trends as a result of which there is a fair demand of their products in the market. Hence only 2.5% were satisfied with their earning whereas 97.5% were dissatisfied. Reddy 2001 also reported in his study that the market for the Jamshedpur artisans products/ services are shrinking, productivity in household modes of production continues to be low, quality of products

Table 7: Networking with the marketers (N = 80)

Strategy for selling of the product				No Networking with marketers		Reasons for selling personally*			
Yourself		Through Agents/ Broker				Broker takes commission		Marketers pay us very less than market Price	
N	%	N	%	N	%	N	%	N	%
26	32.5	54	67.5	30	37.5	12	15	20	25

*Multiple responses

Table 8: Monetary Benefit / Satisfaction with the earning (N=80)

Monetary Benefit				Satisfaction with the earning			
Monthly		According to work		Yes		No	
N	%	N	%	N	%	N	%
63	78.8	17	21.3	2	2.5	78	97.5

made is poor compared to industrial products and costs of various inputs are rising while the mostly poor clientele are reluctant to pay higher prices.

The overall findings of the study revealed the position of the artisans in the present scenario, an artisan represents the profile of a person with great skill, creativity and capability for self employment but lacking in finance, less demand of their products due to less innovation, unavailability of local market and were always at the mercy of intermediaries who have access to both finance and market. Credit facilities, financial support, regular training to upgrade the technology and production techniques, implementation of welfare schemes for artisans should be provided from time to time to encourage the artisan and help in the survival of the artisan. Hence it is clear that the artisan's skills have lost their value and declining from generation to generation.

CONCLUSION

An artisan is a skilled manual worker, who crafts items that may be functional or strictly decorative including furniture, pottery, clothing, jewellery, household items and tools. In the current global setting, micro producers and artisans face the loss of their backward and forward linkages. The major problems faced by the artisans, were the lack of demand of the products and lack of finance because of the other machine made products. Quality and low cost replace the demand of traditional ones. Due to less demand, they were not able to earn good income out of it. Reason being that they were not able to use such innovations and technology because of lack of finance which would enhance their productivity and sale. Another problems faced by the artisans was that they had no networking with the marketers, non availability of transportation and lack of training for product enhancement and marketing style. Respondents

expressed that the marketers pay them very less than the market price and broker takes commission to sale their products. They also reveal that there is a need to put innovations in the products and marketing style. In order to revive the traditional skill, training for products enhancement and market should provided them avenues for better sale. Due to non-availability of transportation, they sold their products within the area where profit is less which further deteriorate their status due to less earning.

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Identification of Indicators of Sustainable Dairy Farming

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ABSTRACT

Dairy farming plays a significant role in building nation's economy and augmenting socio-economic role by supplementing family income and generating employment in the rural sector. It is largely the vocation of the poor in India. In fact, dairy farming would provide sustained income for the farm families through improving the livelihood of farming community. This study was carried out to identify the indicators for sustainable dairy farming among members of women dairy co-operative societies in Puducherry region. Data were collected from continuous pourers and discontinued pourers. A two way comparison was done to identify the indicators, a) comparison between the same continuous pourers with a gap of four years and b) the comparison between the continuous pourers and discontinued pourers. The identified indicators of sustainable dairy farming from the above two comparisons were found to be annual income from dairy farming, quantity of milk sold in a year, duration of milk supplied in a year, number of cows in milk, herd size, contribution of dairy farming to the total family income, total family income and number of local cows owned.

Keywords: Dairy farming, Indicators, Sustainability, Women, Dairy cooperatives

INTRODUCTION

India is the largest producer of milk in the world with 127 Million tonnes and most of the milk is produced by small, marginal farmers and landless labourers. This is because dairy farming has become an important secondary source of income for millions of rural families. It has assumed the most important role in providing employment and income (Annual Report, 2012) as livestock sector is directly linked to the livelihood of more than 70 per cent of rural household (Anonymous, 2012). Livestock rearing provides meaningful occupation, assured income and ensures better utilization of human resources. Animal husbandry and agriculture are the twin occupations, which from time immemorial have played a significant role in improving the rural economy (Anonymous, 2012). Dairying is considered as an important source of supplementary income from farming and an employment provider, as a means to supplement the income of the households ensuring adequate and stable income (Gautam *et al.*, 2007), cushioning farm families from instability of crop production (Patel, 2008), crop failures (Birtal and Rao, 2001). Livestock also act as

best insurance against vagaries of nature (Annual Report, 2012) Thus concluding that dairying helps to alleviate poverty, smoothen income distribution and in the process assures a balanced development of the rural economy (Arora *et al.*, 2006). The growth in the livestock sector was expected to reduce poverty, as the livestock wealth was largely concentrated among the marginal and small landholders.

Livestock rearing at the household level was largely a women led activity and play a major role in care and management of livestock (Anonymous, 2012) and therefore the income from livestock and decisions regarding livestock were primarily taken by women. Having recognised the women's role and contribution in dairy farming, National Dairy Development Board (NDDB) decided that it would be appropriate to start Women Dairy Co-operative Societies (WDCSs) for enhancing their participation in dairy business (Rao, 1995). Interventions such as these in India have demonstrated that the support for livestock has contributed significantly to the empowerment of women (Wall, 2010). To proceed in the same direction in the future, dairy farming should be made sustainable

and an occupation is said to be sustainable only when one continues the occupation for a relatively longer period in their livelihood development. Thereby, continuing the occupation of dairy farming becomes inevitable to maintain sustainable income from dairy farming.

Sustainable dairy farming is explained as an interaction of many factors that influence production, production environment, longevity of life and input management. Similar is the situation in Puducherry region where dairy farming has also been identified as an important income generating activity that could help women to move out of poverty. Therefore the Pondicherry Cooperative Milk Producers' Union established 18 Women Dairy Co-operative societies (PONLAIT report, 2009). Since the daily requirement of milk in Puducherry was about 2.72 lakh litres (Natchimuthu *et al.*, 2005) and the daily milk procurement by PONLAIT has reached only 60,000 litres (PONLAIT report, 2009), both Government and Non-Governmental Organizations have implemented several dairy development programmes to increase the milk production and procurement in order to bridge the ever widening gap. Notably since many of these programmes are implemented through the Women Self Help Groups, rearing of dairy cattle by women has attained a major impetus. At this scenario a study on the identification of probable indicators of sustainable dairy farming has been undertaken and discussed in their paper.

MATERIAL AND METHODS

The study was conducted in Puducherry region. Out of 18 functional WDCS, 14 WDCS distributed in all 6 communes that have been functioning for more than five years were chosen. From these 14 WDCS, one WDCS from each commune was selected at random making a total of six WDCS representing six communes. The list of all registered members who had poured milk during the financial year (April-March) 2004-05 and 2008-09 were obtained from the records of union (PONLAIT) and six selected WDCSs. The respondents were categorized as continuous pourers and discontinued pourers based on the period they poured milk in the concerned WDCS. Continuous pourers were those who are members of WDCS and have been pouring milk in the years 2004-05 and 2008-09.

Similarly, Discontinued pourers were those who

were members of WDCS and have poured milk in the year 2004-05 but not in the year 2008-09. From each of the selected WDCS, 20 respondents representing both the categories (continuous and discontinued) were selected by adopting stratified proportionate random sampling method ensuring that at least 5 from each category is represented in the sample of 20 respondents. Thus a total of 120 respondents were selected from the six WDCSs for the study.

Regarding the identification of indicators for sustainable dairy farming, a list of probable variables was prepared from review of literature and discussions with experts a total of 41 variables were collected. This list was mailed the judges for obtaining their rating on relevancy of each variable on a three point continuum (Highly relevant, Relevant, Not relevant). The responses of these judges were assigned with scores of 3, 2 and 1 for highly relevant, relevant, and not relevant responses respectively. Based on the total score obtained the variables were ranked. The first twenty variables were used in the schedule for selection of indicators.

The selected 20 variables were incorporated in the interview schedule in order to identify the indicators of sustainable dairy farming. Thereafter, the required primary data were collected from the respondents by using pre-tested interview schedule by personal interview method. The required secondary data were also collected from the milk procurement records of the WDCSs and PONLAIT milk union. The variables which could differentiate continuous pourers and discontinued pourers statistically were identified as indicators of sustainable dairying.

RESULTS AND DISCUSSION

For the identification of indicators, a 2 way comparison was performed and the results is presented as follows

From Table 1, it was found that there was no significant difference observed between the continuous pourers and discontinued pourers in mean values of the variables viz., age, land, number of crossbred cows, number of local breeds, and family's milk consumption per day, total family income per annum and contribution of dairying to total family income in 2004-05. Whereas, the mean difference in duration of milk supplied to WDCS in a year (months), herd size, number of cows in milk, quantity of milk sold in a year and annual income from dairy farming were found to be statistically significant.

These variables clearly differentiate continuous pourers and the discontinued pourers in 2004-05.

The comparison between years among continuous pourers and the results were shown in Table 2. From the table it was observed that, although there was a change in mean values of cultivable land, number of months milk supplied to the WDCS, quantity of milk sold in a year, milk consumption of the family per day, crossbred cows per household among the same respondents over a period of 4 years, the change was not statistically significant. This indicated that the change observed over a period of 4 years was not significant enough to have influence on sustainability of dairy farming. The decrease in mean values of herd size, number of cows in milk, number of local cows,

duration of milk supplied to the WDCS in a year (months), contribution of dairying to total family income and the increase in the mean values of annual income from dairy farming, quantity of milk sold in a year, total family income were found to be highly significant statistically. These variables were the ones whose changes were significant among the continuous pourers over a period of time.

Based on the comparisons (Table 1 and 2) eight variables which have been found statistically significant in any one of the above comparison were selected as indicators of sustainable dairy farming and these indicators of sustainable dairy farming are presented in Table 3. Annual income from dairy farming, quantity of milk sold in a year, number of months milk supplied

Table 1: Comparison of mean values between continuous pourers and discontinued pourers in 2004-05

Parameters	Mean CP1 (77)	Mean DP1 (43)	Mean difference	t value
Age (years)	46.34	46.51	-0.17	0.08
Land (acres)	0.95	0.88	0.07	0.23
Herd size (nos)	6.26	4.67	1.59	2.33*
Number of cows in milk	3.55	2.63	0.92	2.37 *
Number of crossbred cows	2.65	2.1	0.55	1.68
Number of local cows	0.89	0.56	0.33	0.94
Duration of milk supplied to WDCS in a year (months)	9.84	8.67	1.17	2.86 **
Quantity of milk sold/household/year (lt)	1265.22	851.53	413.69	3.40**
Milk consumption/household/day (lt)	0.97	0.95	0.02	0.12
Annual income from dairy farming (Rs. in 000)	12.36	8.16	4.2	3.46**
Total family income/annum (Rs. in 000)	60.24	50.52	9.72	1.37
Contribution of dairy farming to the total family income (%)	37.55	29.09	8.46	1.73

** $p < 0.01$; * $p < 0.05$

Table 2: Comparison of mean values of indicators among the continuous pourers in different years (N=77)

Variables	2004-05	2008-09	Mean difference	t value
Cultivable land (acres)	0.95	0.89	0.06	1.50
Herd size (nos)	6.26	4.39	1.87	3.74 **
Number of cows in milk	3.54	2.62	0.92	2.90 **
Number of crossbred cows	2.6	2.42	0.18	1.64
Number of local cows	0.9	0.2	0.70	2.70**
Duration of milk supplied to WDCS in a year (months)	9.84	9.59	0.25	1.47
Quantity of milk sold/household/year (lt)	1265.22	1608.33	-343.11	1.63
Milk consumption/household/day (lt)	0.97	0.94	0.03	0.83
Annual income from dairy farming (Rs. in 000)	12.36	23.99	-11.63	2.89 **
Annual family income/annum Rs. in 000)	60.24	96.64	-36.4	6.50 **
Contribution of dairy farming to the total family income (%)	37.56	29.73	7.83	2.97 **

** $p < 0.01$

Table 3: Indicators of sustainable dairy farming

Parameters	Mean 2004 CP ₁ (77)	Mean 2004 DP ₁ (43)	't' values CP ₁ -DP ₁	Mean 2004 CP ₁ (77)	Mean 2008 CP ₂ (77)	't' values CP ₁ -CP ₂
Annual income fromdairy farming (Rs. in '000)	12.36	8.16	3.46**	12.36	23.99	2.89 **
Quantity of milk sold in a year (lt)	1265.22	851.53	3.40**	1265.22	1608.33	1.63
Duration of milk supplied tothe WDCS in a year (months)	9.84	8.67	2.86 **	9.84	9.59	1.47
Number of cows in milk	3.55	2.63	2.37 *	3.55	2.62	2.90 **
Herd size (Nos)	6.26	4.67	2.33*	6.26	4.39	3.74 **
Contribution of dairy farmingto the total family income (%)	37.56	29.09	1.73	37.56	29.73	2.97 **
Total family income (Rs. in '000)	60.24	50.52	1.37	60.24	96.64	6.5**
Number of local cows	0.89	0.56	0.94	0.9	0.2	2.7**

** p < 0.01; * p < 0.05 Figures in parenthesis indicate number of respondents; CP₁ - Continuous pourers (2004-05); DP₁ - Discontinued pourers (2004-05); CP₂ - Continuous pourers (2008-09); DP₂ - Discontinued pourers (2008-09)

to the WDCS in a year, number of cows in milk, herd size and contribution of dairy farming to total family income , total family income and number of local cows were selected as indicators based on their statistical significance.

The data presented in Table 3 could bring out one way of grouping the indicators viz., income (annual income from dairy farming and contribution of dairy farming to total family income and total family income), milk sales (quantity of milk sold in a year and duration of milk supplied to the WDCS in a year) and number of animals (number of cows in milk, herd size, number of local cows). These eight indicators of sustainable dairy farming selected are individually discussed below:

Income from enterprise is an important factor of sustainability. The annual income from dairy farming was almost doubled over a period of 4 years from 2004-05 to 2008-09 which was statistically significant (Fig. 1). The average annual income from dairy farming of

continuous pourers had increased from Rs .12, 360 in 2004-05 to Rs. 23,990 in 2008-09.

This might be due to increase in procurement price of milk from Rs. 8.75 to Rs. 13.07. Similarly, there was a significant difference in the dairy farming between the continuous pourers and the discontinued pourers, which were Rs.12, 360 and Rs. 8,160 respectively in 2004. This difference in income from dairy farming was also found to be statistically significant.

From the Fig. 2 it is noticed that there was an increase in the quantity of milk sold by the continuous pourers from 1,265 litres in 2004-05 to 1608 litres in 2008-09. However, this increase was not found statistically significant. The increase in the quantity of milk sold could be attributed to increase in productivity of the animals. There was a significant difference in the quantity of milk sold between the continuous pourers and discontinued pourers. The average quantity of milk sold by the discontinued pourers in 2004-05 was 851

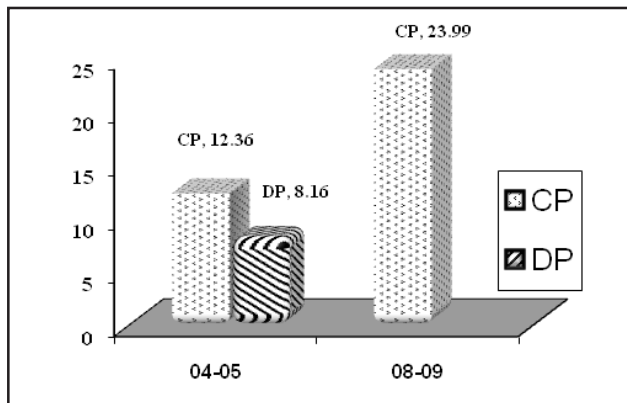


Fig. 1: Annual income from dairy farming (Rs in '000)

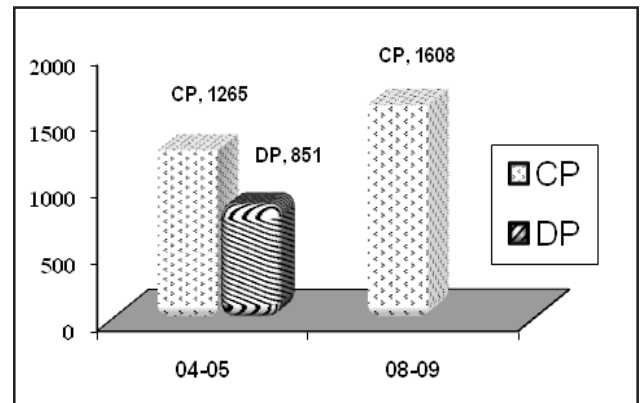


Fig. 2. Quantity of milk sold in a year to the WDCS

litres which was nearly three-fourths the quantity of the milk sold by the continuous pourers, (1265 litres) during the same period. This difference in the quantity of milk sold to the WDCS was found to be highly significant. From the result it could be inferred that a minimum of 1200 litres of milk is needed to be sold in a year to earn an income which will support the farming activities, so that farmers can continue dairy farming. Thus 1200 litres was equivalent to about 210 days a woman could be employed at the then prevailing wages of Rs.50 per day and the average milk price of Rs.9 per litre.

The bar diagram in Fig. 3 depicts duration of milk supplied by continuous pourers and discontinued pourers were 9.84 and 8.67 months respectively in 2004-05 which was statistically significant. Whereas, the number of months milk supplied to the WDCS by the continuous pourers over the period was marginally reduced from 9.84 months in 2004-05 to 9.59 months in 2008-09. This difference was not statistically significant. It is evident from the results that the dairy farmers had to supply milk at least for 9 months in a year so that she could receive income at least three-fourths of a year which helps them to be in business continuously. The minimum quantity of milk production and sale combined with minimum period of income in a year would have influence on sustainability of dairy farming in the study area.

The Fig. 4 shows that, among the continuous pourers the average number of cows in milk had come down from 3.55 in 2004-05 to 2.62 in 2008-09 which was 2.62 which was almost the similar situation of the discontinued pourers in 2004-05 where the average number of cows in milk was 2.63. The difference in number of cows in milk between continuous pourers (3.55) and discontinued pourers (2.63) in 2004-05 was

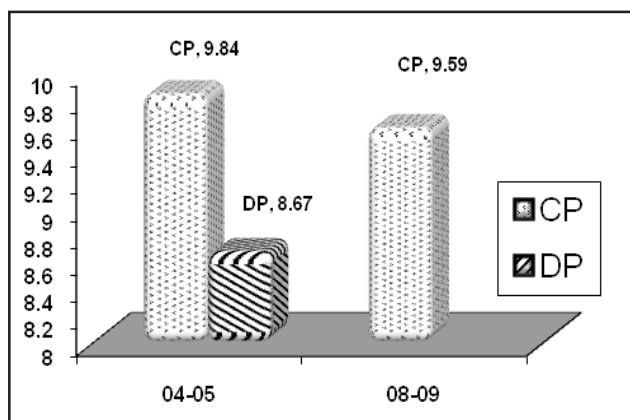


Fig. 3. Duration of milk supplied in a year (months)

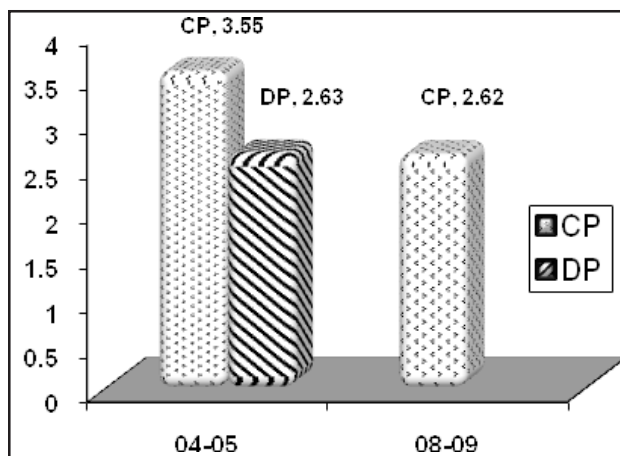


Fig. 4. Number of cows in-milk/household

also statistically significant. This decrease in number of cows in milk over a period of 4 years was found to be statistically significant.

From the Fig 5 it is evident that the average herd size of continuous pourers had come down from 6.26 to 4.39 over a period of 4 years. This decrease in herd size from 2004-05 to 2008-09 was highly significant. This significant decrease in herd size could be due to decrease in number of local cows as well as the marginal decrease in crossbred cows per household. The difference in herd size between the continuous pourers and discontinued pourers was found to be statistically significant in 2004-05. The average herd size of continuous pourers in 2008-09 was 4.39 and was almost similar to the average herd size (4.67) of discontinued pourers in 2004-05. The results (Fig. 6) also showed that there was a decrease in the percentage contribution of income from dairy farming to the total family income between the years 2004-05 and 2008-09 among the continuous pourers (from 37.53 % to 29.73%). The

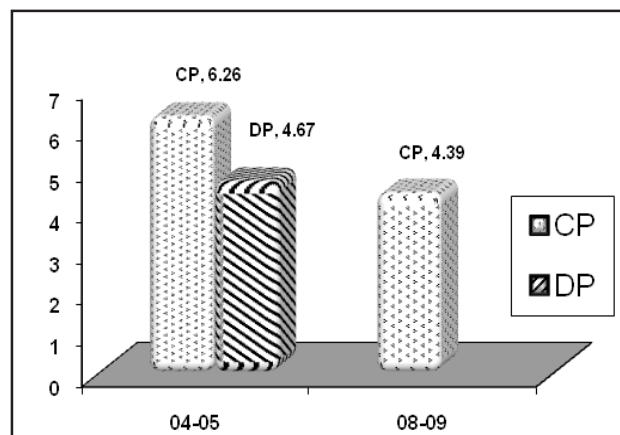


Fig. 5. Herd size/household

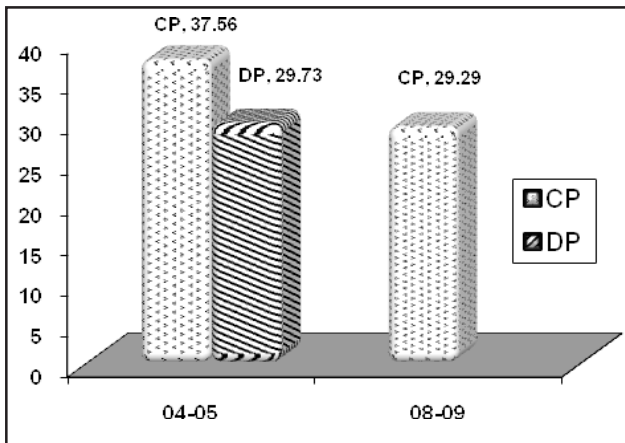


Fig. 6. Contribution of dairy farming to the total family income (%)

decrease of income from dairy farming was found to be statistically significant. This decrease in percentage contribution could be due to more cash inflow from other sources where the family members are engaged in. Also a considerable difference in contribution of income from dairy farming was observed between the continuous pourers (37.56%) and discontinued pourers (29.09%). But this difference was not statistically significant. The trend in the Fig 6 showed that contribution of income from dairy farming falls below a certain level (29%) the farmers are likely to discontinue dairy farming. If the contribution is more than one third of the total income the chances of continuing dairy farming are bright. A combination of two or more identified indicators could be used to arrive at a conclusion whether or not a family will sustain dairy farming. These indicators are key points to be focused by researches or policy makers to consider in order to make dairy farming sustainable in regions like Puducherry where dairying is showing a declining trend.

It is clear from the Fig. 7 that the total family income of continuous pourers and discontinuous pourers were Rs. 60,240 and Rs. 50,520 respectively. There was a difference of about Rs. 10,000 observed between the continuous pourers and discontinued pourers in 2004-05. However, this difference in income was not found statistically significant. Similarly, the income of continuous pourers and discontinued pourers in 2008-09 were Rs. 96,640 and Rs. 72,860 respectively. Although the difference between the continuous pourers and discontinuous pourers was Rs. 24,000. This was not found statistically significant. Whereas, the increase in family income among the continuous pourers (CP₁ & CP₂) and also among the discontinued

pourers (DP₁ & DP₂) between the years 2004-05 and 2008-09 were found to be statistically significant. In addition to inflation, the increase in total income of all households might be due to either increase in number of earning members or increase in cash inflow from other sources. It is also observed that the increase in income of continuous pourers was higher than the income of discontinued pourers in 2004-05 and 2008-09. From the above information it could be inferred that resource poor or low income group family finds more difficulty in continuing dairy farming which demands at least some resources to meet emergency situation.

It is also noticed that if the discontinued pourers (DP₂) had continued dairy farming, their income could have been almost equal to the income of the continuous pourers in 2008-09 (Table 3). The average annual income contributed by dairy farming was Rs. 23,990 which was the only difference in income between continuous pourers and discontinued pourers in 2008-

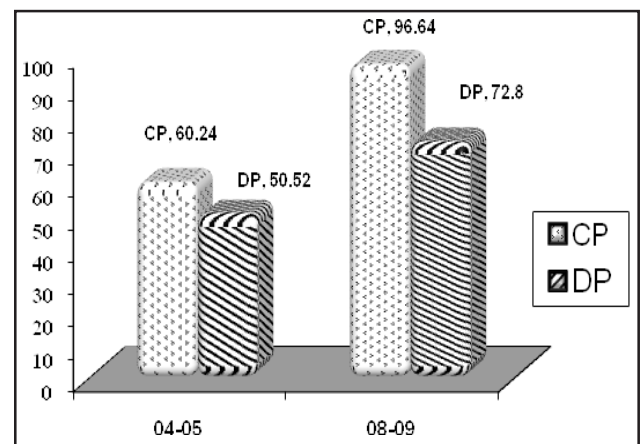


Fig. 7. Total family income (in '000)

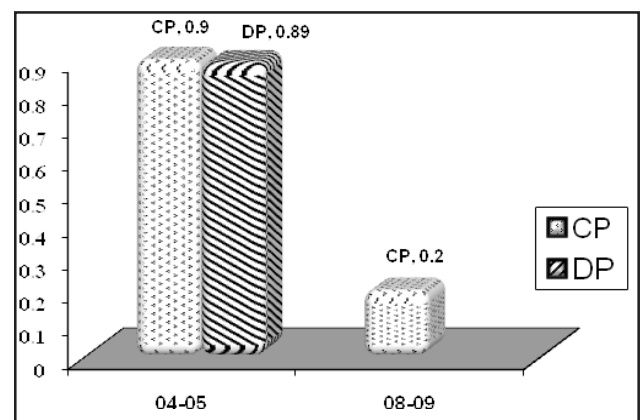


Fig. 8. Number of local cows

09. The Fig. 8 showed that the average number of local cows per household among the continuous pourers (CP₁ & CP₂) had come down from 0.9 in 2004-05 to 0.2 animals in 2008-09. This decrease in number of local cows over a period was found to be statistically significant. The decrease in the local cows could be attributed mainly to the rigorous implementation of cross breeding programme in the region of Puducherry. The difference in number of local cows between continuous pourers (0.9) and discontinued pourers (0.89) in 2004 was negligible and it was not found statistically significant.

CONCLUSION

Dairy farming would be sustainable, if the income from it is at least equal to the wages received by agricultural labourers. The annual income from dairy farming, quantity of milk sold in a year, duration of milk supplied to the WDSC in a year, number of cows in milk, herd size, contribution of dairy farming to the total family income, total family income and number of local cows were identified as indicators of sustainable dairy farming. This would be useful to the policy makers and dairy development programmers in planning and implementation of the dairy development programmes as these indicators would help in differentiating the dairy farmers who would sustain in dairy farming from those who would not. Regarding the dairy farmers who are identified as those who would not sustain in dairy farming, these indicators grossly aids in identifying the lacunae existing among such farmers thereby necessary amendments can be made to make them sustain in dairy farming. These indicators also can aid in providing the information on the minimum requisites and for planning and execution of various dairy development programmes that could later aid in framing policies in the near future.

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Determinants of Micro Finance and Credit Institutions in Farm Business, Kilte-Awlaelo District, Eastern Zone of Tigray Region, Northern Ethiopia

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ABSTRACT

Credit provision is one of the principal components of rural development, which helps to attain rapid and sustainable growth of agriculture. Agricultural lending involves giving out of credit (in cash and kind) to small-scale farmers for the purpose of farming. There is no doubt about the crucial roles of credit in economic development. In spite of the importance of loan in agricultural production, its achievement and repayment are burdened with a number of problems especially in the small holder farming organized as cooperatives. Currently, there are different organizations involved in providing credit to beekeeping cooperatives of the Kilte-Awlaelo District. The organizations are trying to organize beekeeping cooperatives, promote both improved and traditional beekeeping practices by providing credit. The main objectives of these cooperatives are to improve the living standard and market access of the members and repay their credit on time. However, the cooperatives are unable to payback their credit according to the contract due to many factors. Therefore, this research aimed at analyzing and examining the determinants of loan repayment on beekeeping cooperatives. To meet this objective data was collected and multistage sampling and simple random sampling methods were employed to select sample beekeeping cooperatives and sample cooperative members. Besides, key informant interview and focus group discussion was held. Based on this a total of 170 respondents were included in the study. The analysis was made using descriptive statistics and logistic model using 15 variables. Based on the result of the analysis age, family size, annual income, livestock ownership, access to additional source of credit, loan size and supervisory visit were found significant to enhance loan repayment at $P < 0.10$. However, sex of cooperative members (taking male as reference), and number of dependent are factors that significantly increase the probability of loan default at $P < 0.10$ level of significance. Therefore, based on the results obtained in this study, it is recommended that credit institutions or lending agencies should look out for the demographic and socio-economic characteristics that significantly influence loan repayment before granting loans and advances to beekeeping cooperatives to reduce the incidence of loan defaults. Besides, effective supervision, training, lending appropriate amount of loan and promoting woman participation on beekeeping cooperative, so as loan default could be minimized.

Keywords: Loan repayment, Multistage sampling, Focus group discussion, Logistic model

INTRODUCTION

Ethiopia is one of the lowest income countries in the world. Its economy, which is mainly dependent on agriculture, Agriculture provides 85% of the employment, 50% of the GDP and About 90% of export revenue. In spite of huge agricultural potential, the growth in agricultural production has not been able to keep pace with that of the demand due to variety of factors. The particular study site, Kilte Awlaelo District is located in Eastern Zone of Tigray, at about 50 kms

to the North of Mekelle (Regional capital) along the Mekelle-Adigrat main road. Kilte Awlaelo District has 18 rural administrative localities called 'tabias'. The total area of the District is 100,556 hectare. The altitude ranges between 1900-2300 masl. The mean annual rainfall falls between 400 mm-600 mm and the temperature ranges from 16°C-27°C. There are eighteen honey producing Tabias (Villages) in the District, with eighteen beekeeping cooperatives with total of 552 membership. Currently honey is the most important cash income generating commodity in the Woreda, with

an annual output of 234.61 metric tons (MTs) of both traditional and modern boxes. Out of the total production 95% is supplied to the markets of Wukro, Atsbi Womberta, Hawzen and Mekelle. The total population of the District is estimated to be 117,862. Out of the total population, 60,330 (51.2%) were female. The total households are 24,253; out of which 3,647(15%) are women headed households. The age distribution of the population in the District was 44.3% under 15 years, 52.2% between 15-64 years and 3.5% were 65 and above.

Lack of access to credit was one of the shocks the economy has been experiencing. Generally the accessibility of a good financial service is considered as one of the engines of economic development. In the recent years, however some NGOs have been providing credit to poor households in some parts of the country, side by side with activities like delivering relief and development services. The loans given by these NGOs are very small, in short term period, with in short period repayment system and with no access to collateral help. Therefore, these institutions are facing the challenges of beneficiaries to pay back the credit according to the contract. So they find themselves unable to continue providing credit service. Credit provision is one of the principal components of rural development, which helps to attain rapid and sustainable growth of agriculture. There is no doubt about the crucial roles of credit in economic development. In spite of the importance of loan in agricultural production, its achievement and repayment are burdened with a number of problems especially in the small holder farmers organized as cooperatives. Most of the defaults arose from poor management procedures and unwillingness to repay loans. Currently, there are eighteen beekeeping cooperatives having legal recognition with about 552 members organized by Kilte-Awlalo District Agricultural and Rural Development Office. The main objectives of these cooperatives are to improve the living standard and markets access of the members and repay their credit on time. However, the cooperatives are unable to payback their credit according to the contract due to many factors. Therefore, this research aimed at analyzing and examining the determinants of loan repayment on beekeeping cooperatives of Kilte–Awlaelo District as there was no adequate study previously conducted.

MATERIAL AND METHODS

The study area was Kilte Awlaelo District which is

purposively selected by considering its potential for beekeeping. The current state of beekeeping development interventions in the area. The Woreda has higher number of beekeeping cooperatives, and beekeeping is also being practiced as a means of income generation and improving house hold food security.

The study include primary and secondary data. The primary data was collected using, questionnaire Survey, focus Group Discussion, and key informant interview. The secondary data was collected from different organizations, researches and other related literatures. Multi-stage sampling technique was adopted in selecting the respondents. The first stage involves purposive selection of six Tabias in the Woreda where there is preponderance of beekeeping cooperatives that obtained loans for agricultural purposes. The second stage involves a simple random selection of one beekeeping cooperatives from each of the six selected Tabias. The third step involves adopting simple random sampling technique to select respondents from each cooperative.

From the total 269 members of the selected cooperatives 44% that is 120 members were selected as questionnaire respondents. Three members of Management of each cooperative were the key informants. And Five to Eight members from each cooperative were included in focus group discussion. Thus, a total of 165 (One sixty five) respondents were included in this study. Descriptive statistics method was used to describe and analyze the characteristics of the population under study such as mean, percentage, standard deviation, tabulation, and frequency distribution. For this research Binary logit model was used to estimate the effect of hypothesized variables on loan repayment. The cumulative logistic probability model is econometrically specified as:

$$P_i = F(Z_i) = F(\alpha + \sum b_i X_i) = \frac{1}{1 + e^{-z_i}} \dots\dots\dots(1)$$

The logit model could be written in terms of the odds and log of odds.

Where, P_i = is the probability that an individual will repay or does not given X_i ;

e = denotes the base of natural logarithms, which is approximately equal to 2.718;

X_i = represents the i^{th} explanatory variables; and

α and β_i = are parameters to be estimated

- The logit model could be written in terms of the odds and log of odds.
- The odds ratio implies the ratio of the probability (Pi) that an individual would choose an alternative to the probability (1-Pi) that he/she would not choose it.

$$(1-P_i) = \frac{1}{1+e^{z_i}} \dots\dots\dots (2)$$

Therefore,

$$\left(\frac{P_i}{1-P_i}\right) = \frac{1+e^{z_i}}{1+e^{-z_i}} = e^{z_i} \dots\dots\dots (3)$$

- Taking the natural logarithm of equation (3)

$$Z_i = \ln\left(\frac{P_i}{1-P_i}\right) = \alpha + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_n X_{in} \dots\dots\dots (4)$$

- If the disturbance term (ui) is taken into account, the logit model becomes

$$Z_i = \alpha + \sum_{i=1}^m \beta_i X_i + u_i \dots\dots\dots (5)$$

RESULT AND DISCUSSION

Among the total 120 sample members 24.17% (n=29) are female while the remaining 75.83% (n=91) are male members. This indicates that proportion of male member of cooperative are higher than female members. Looking at the educational status of the sample respondents, illiterate -25.83% (n=31), basic education - 6.67% (n=8), primary - 58.33% (n=70), high school - 6.67% (n=8), diploma - 2.5% (n=3), looking at the occupation of the cooperative members, 87.5% (n=105) are farmers, 7.5% (n=9) are involved in trading and the rest 5% (n=6) are civil servants.

Assessment of loan repayment

Loan repayment with respect to sex of the cooperative members: The sex of the cooperative members is one of the most important factors that determine loan repayment. From the total twenty nine female members 65.5% (=19) have repaid their loan. On the contrary, out of the total ninety nine male members 62.7% (n=57) have repaid their loan. The indication here is that there is a positive relationship between female membership and better loan repayment status. This result indicates that female borrowers have better managed their loan than their male counterparts.

Loan repayment with respect to Age of the cooperative members: Age of the cooperative members is one of the factors which are expected to affect loan repayment. While the rest between 56-70 years and above 71 years has repaid 100% respectively. This indicates that as the age of the respondents increased it is expected they will be more stable.

Loan repayment by Educational status of cooperative members: Education is one of the key variables that may influence the behavior and attitude of borrowers in loan repayment. It was assumed that the higher the educational status, the better would be the knowledge and awareness level on efficient utilization of loan. However, coming to the actual ground of the cooperative members the repayment rate decreases with increasing the level of education. Looking at their repayment rate 70.9% of the illiterate has repaid their loan, but only 33.33% of those who had college diploma has repaid their loan. In line with this it was explained in the focus group discussion that, as the educational status of members increased the probability of loan diversion increase. Thus, probability of loan repayment will decrease.

Loan repayment by total family size and number of dependents: The other important factor that features remarkable difference on loan repayment is family size and number of dependents in the household of cooperative members. The result in the above table shows that with increasing family size the probability of loan repayment increased. The result in the above table shows that with increasing family size the probability of loan repayment increased. As explained in the focus group discussion, it was raised that those households with larger family size able to generate higher income from off farm and non-farm activities and will possibly repay their loan as compared to the households with smaller family size. This is also true that with increasing number of dependents in the household the repayment status is also better off.

Annual Income of cooperative members and loan repayment: It is important to point out here is that the total income from the different sources (off farm, non-farm and farm income) is considered as a determinant of loan repayment. The result indicates that, probability of repayment increase as the annual income of the cooperative increases.

Land holding and Access to irrigation with respect to loan repayment: The size, location and quality of land is

Table 1: Maximum likelihood regression of logit model for loan repayment

Variables in the equation		B	S.E.	Wald	d.f.	Sig.	Exp (B)
Step 1 ^a	SEX(1)	-2.929	1.633	3.219	1	0.073***	18.712
	AGE	0.310	0.119	6.762	1	0.009*	1.363
	EDUC			0.992	4	0.911	
	EDUC(1)	1.762	4.554	0.150	1	0.699	5.825
	EDUC(2)	-0.420	4.849	0.008	1	0.931	0.657
	EDUC(3)	0.916	4.483	0.042	1	0.838	2.500
	EDUC(4)	1.170	5.078	0.053	1	0.818	3.223
	FAMSIZ	1.021	0.475	4.620	1	0.032**	2.776
	NDEP	-0.844	0.474	3.168	1	0.075***	0.430
	LSOWN(1)	5.304	2.810	3.562	1	0.059***	201.097
	ANINC	7.147	2.030	12.391	1	0.000*	0.001
	ACCIRRG(1)	-0.386	1.152	0.113	1	0.737	0.679
	LAHO	-1.652	1.070	2.383	1	0.123	0.192
	LONSIZ	0.000	0.000	4.699	1	0.030**	1.000
	INTRATE	-0.152	0.126	1.471	1	0.225	1.165
	AOSC(1)	2.664	1.439	3.429	1	0.064***	0.070
	PSOINS(1)	0.000	0.000	0.539	1	0.463	1.000
	TBL(1)	3.232	5.200	0.386	1	0.534	0.039
	SUPVIST(1)	4.343	2.150	4.082	1	0.043**	0.013
	Constant	-13.811	7.723	3.198	1	0.074	0.000

a. Variable(s) entered on step 1: SEX, AGE, EDUC, FAMSIZ, NDEP, LSOWN, ANINC, ACCIRRG, LAHO, LONSIZ, INTRATE, AOSC, PSOINS, TBL, SUPVIST.

-2 Log likelihood= 38.258; R²=.862; Chi-square= 119.459; *significant at 1%, **significant at 5%, ***significant at 10%

considered as a major factor that determines the annual farm income of households'; hence loan repayment. The result indicates, size of land owned by a farm household has a positive relationship with the household's loan repayment performance. This implies that landless households and households with small size of land are more or less unable to repay their loan. The same is true for access to irrigation.

Livestock holding with respect to loan repayment: Livestock represents the most important livelihood resource. Thus determines loan repayment status of cooperative members. The indication here is the cooperative members who do not own livestock were less able to pay their loan as compared with those members who own livestock.

Access to additional credit sources with respect to loan repayment: Access to additional credit sources is determinant factor for loan repayment. If the members have other sources of loan, they may use these sources to be able to settle their loan obligation in case they are forced to repay. The result provides evidence that, access to additional credit services have significant influence on loan repayment capacity of the cooperative members.

Participation of cooperative members in local social institutions: Participation and access to local institutions (Ekub, Edir, farmers association, spiritual/religious associations (*Tsebel*), and other associations) are significant determinants of loan repayment. The result shows, those households who are members of a given association seem to have a better repayment capacity.

Loan repayment with respect to supervision by loan organization: Sufficient number of supervision by loan officer on loan utilization is an important factor contributing to a better loan repayment. The result shows that supervision by loan organization is positively related to loan repayment performance as the percentage defaulter not supervised is more than twice of defaulter who are supervised.

Loan repayment and composition by training given before loan: Training increase the awareness of the borrowers and would increase the exposure to information, opportunities, and working environment. And it is expected to have positive impact on loan repayment. The result indicates 64.1% of those who have got training have repaid their loan while only 33.33% of those who have not taken training were able to repay their loan. This shows the existence of positive

relationship between training before loan and loan repayment.

Loan repayment composition by loan size and Interest rate: If the amount of loan released is enough for the intended purpose, it will have a positive impact on the capacity of repayment. On the contrary, if the amount of loan exceeds, it will be more of burden than be of assistance; there by loan repayment will decline. The result indicates there is only small difference in repayment as the loan of the cooperative increases. The same is true for interest rate.

Econometric analysis

Determinants of loan repayment: When binary logit model is used for analysis, it is focused on the significance of each variable on determining loan repayment performance of cooperative members. Moreover, fifteen variables are used for the logistic model estimation purpose. Out of the fifteen proposed variable, nine of them were statistically significant in the model, while the rest were not significant at ($P < 0.10$). Based on the model result sex, education, number of dependents, interest rate, land holding, and access to irrigation were found to have negative sign, with loan repayment while the remaining variables had positive association.

CONCLUSION

This study was designed to develop an understanding on the determinants of loan repayment on beekeeping cooperatives. Accordingly, efforts have been made to assess the demographic characteristics, socio-economic characteristics of cooperative members and institutional factors which affect loan repayment of the cooperative members. Moreover, the results indicated that age, family size, livestock ownership, annual income, loan size, access to additional source of credit and supervision by lending organization have positive and significant association with loan repayment. Meanwhile sex of cooperative members' and number of dependents are negatively associated with loan repayment at a significant level. Thus it can be concluded that, age, family size, livestock ownership, annual income, loan size, access to additional source of credit and supervision by lending organization are factors that

significantly enhance loan repayment. Besides, sex of cooperative members' and number of dependents are factors that significantly undermine loan repayment. Based on the above results number of recommendations are given on how to promote loan repayment on beekeeping cooperative with particular reference to the study areas. Efforts should be made on strengthening and promoting awareness creation about how rural households organize themselves and participate in beekeeping activities which helps to reduce rural unemployment. In the study area, female are observed to be less likely to participate in beekeeping cooperatives as compared to male members. Therefore, efforts should be made to enhance women's involvement in beekeeping cooperative activities, which in a way strengthens and bring about better loan repayment status. Credit institutions or lending agencies should also look out for the demographic, socioeconomic characteristics that significantly influence loan repayment before granting loans and advances to beekeeping cooperatives to reduce the incidence of loan defaults. Conflict, poor management and lack of technical knowledge and extension support were identified among the major constraints that restrain cooperatives from becoming profitable and repaying their loan. Thus, efforts should be intensified to provide cooperatives better access to training and supervision for better productivity and repayment. Sufficient Extension services, market information and linkage should be provided for the cooperatives to better manage their business. There by, their productivity and repayment performance would be improved. Finally, further research is needed to establish whether or not there are regional differences in the loan repayment status of the sample cooperative members.

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Accessibility and Preferences of Female-headed Households to various Livestock Extension Services in Small scale Dairying: A Gender Analysis

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ABSTRACT

The present study was carried out in mid western plain zone of Uttar Pradesh to understand the extent of access and preferences of female and male-headed households for various livestock extension services in small scale dairying. Data were collected through interview schedule from 50 female and 50 male-headed households. The study revealed that females heading the households were purchasing most of the animal health related inputs mainly from local market, however, they vaccinated the animals in block veterinary hospital. More than half of male respondents were taking mineral mixture, vaccines and dewormers (37%) from block veterinary hospital. Eighty per cent female respondents had poor access to extension services and training (84%) as compared to 64% male respondents. Statistically significant differences were observed between female and male-headed households for the accessibility of extension services, training, public & private animal health services as well as for marketing.

Keywords: Female-headed households, Small scale dairying, Accessibility, Preferences, Extension services, Trainings and Credit

INTRODUCTION

Rural women play crucial roles in sustaining their families through dairy and agricultural production activities. In female-headed households they have added responsibilities such as livestock owners, processors, users of livestock products and so on. In India 10.35 per cent households are female headed (Census of India, 2001). They provide most of the farm labour, which they combine with caring for their families, conducting farm and non-farm income-generating activities and contributing to community development initiatives. Despite their multiple responsibilities, rural women continue to face major barriers with regard to accessibility to inputs, credit, market, training and various livestock extension services. Extension services traditionally have focused on men by providing training, information, and access to inputs and services. Gender disparities in access to various inputs, extension and training exist throughout the developing world. It has been found in many studies that public livestock health services often fail to serve the poorest livestock keepers, particularly in remote rural areas (Heffernan and

Mistureli, 2008). Female-headed households still have limited credit access (Sisay, 2008). Thus women heads of households face the constraints of credit and labor to participate in extension packages and contacting extension workers and in availing various inputs by various agencies including technologies, infrastructures and information about livestock market. In view of this, the proposed research was carried out to study accessibility to various inputs, extension services and preferences for various livestock extension services among female and male headed households in small scale dairying enterprise.

MATERIAL AND METHODS

The present study was carried out in five different clusters (each comprising 10 villages) of Bareilly district in mid western plane zone. Data were collected from 100 distinct households (50 female-headed + 50 male-headed). Accessibility to various input delivery agencies, accessibility to various animal husbandry related extension services, trainings, animal health services (public and private), credit (institutional and non-institutional) and marketing for selling of dairy produce

of the female and male-headed households was studied separately and expressed in frequency and percentage. Information was also generated regarding the preferences of the respondents for various credit sources and animal health services providers for their animals in the nearby area of the study. Comparative analysis of the female and male-headed households was studied with the help of chi square test with respect to the accessibility of extension services, training, public & private animal health services, marketing for selling of its produce and credit.

RESULTS AND DISCUSSION

The data presented in Table 1 shows that about 16% female-headed households purchased dewormers from block veterinary hospital against 37% male-headed households. Vaccination of the animals of majority of the respondents in both the category was being done by personnel at block veterinary hospital. Sixty per cent of male respondents were purchasing mineral mixture from block veterinary hospital, however, none of the female-headed household purchased mineral mixture from block veterinary hospital. About 94% of the females-headed households were purchasing the fertilizer required for crop production from market. Over two-third female-headed households who owned land, were using the fodder seeds, dry fodder and concentrate of their own field as compared to about 57% male respondents who were mainly procuring the

fertilizer from market and 43.18% from cooperatives and 56% and 84%, respectively, were using fodder seeds of their own fields.

Over three-fourth (80%) female respondents had poor access to extension services and trainings, as compared to male respondents wherein only two-third (64%) had access to extension services and trainings related to livestock farming. This may be due to the fact that most of the extension efforts and technological packages usually address the male farmers. Besides, extension agents mostly like to visit male farmers than female farmers. Statistically significant differences were observed between female and male headed households for their extent of accessibility to extension services and training (Table 2). Researches conducted by Budaka (2005) and UNHS (2005-06) also unveiled the fact that women farmers had little access to information about animal production through public extension services.

The data presented in Table 2 indicates that only 40% female respondents had access to public animal health services against 80% male respondents. Majority of female-headed households had access to private animal health services against 20% male-headed households. Only 42% females heading their households had access to market for selling the products as compared to 88% male respondents. Eighty per cent females had access to non-institutional sources of credit as compared to 44% male respondents. Statistically significant

Table 1: Accessibility of female and male headed households to various inputs delivering agencies (N=100)

Inputs	No. of families using inputs	Female-headed Households (n=50)			
		Agencies			
		Market (%)	Own field(%)	Cooperative (%)	Block vet. hospital(%)
Fodder seeds	33	24.24	75.76	-	-
Fertilizer	33	93.94	-	6.06	-
Dry fodder	50	36.00	64.00	-	-
Concentrate	50	34.00	66.00	-	-
Mineral mixture	05	100.00	-	-	-
Vaccines	20	25.00	-	-	75.00
Dewormers	30	83.33	-	-	16.67
Male-headed Households(n=50)					
Fodder seeds	44	31.82	56.82	11.36	-
Fertilizer	44	56.82	-	43.18	-
Dry fodder	50	16.00	84.00	-	-
Concentrate	50	52.00	48.00	-	-
Mineral mixture	10	40.00	-	-	60.00
Vaccines	35	28.57	-	-	71.43
Dewormers	40	62.50	-	-	37.50

differences were observed between female and male-headed households for the accessibility of public & private animal health services and marketing of produce. In various other studies also it was found that the farm women had limited access to credit, machinery, livestock production inputs and had different access to markets, infrastructures and other services (Devaki, 1999; Kacharo, 2007; Ahuja *et al.*, 2012; Kumar *et al.*, 2012)

Provision of animal health services encompasses basic animal health education, treatment, vaccination, laboratory diagnosis and sample collection, etc. Respondents were asked to reveal the preferences for various animal health service providers. The data presented in table 3 indicates that majority of females heading the households preferred quacks (42-56%) followed by paravet (20-34%) for deworming and vaccinating their animals. Eighty per cent women respondents preferred paravet for artificial insemination due to their easy availability and approachability within village at less payment. The preference of male respondents, however, differed than women respondents. Majority of them preferred block veterinary hospital for artificial insemination (A.I.)

(68%), vaccination (64%) and deworming (50%). Still paravets were preferred by 40% respondents for treatment of sick animals and quacks were least preferred and they were called only for treatment in emergency situations. None of the female-headed households preferred veterinary institute for vaccination, deworming, A.I. and treatment as compared to 10% male-headed households who preferred veterinary institute for availing these services. Preference of traditional healer was more in female-headed households for deworming (26%) and treatment (40%) against only 8 % male-headed households who preferred them for treatment of their animals. The data presented in Table 4 shows that 80% of the female respondents heading their households preferred to have credit from friends and relatives, followed by, money lenders (14%) due to ease in approachability, simple and less rate of interest. Banks were preferred only by 6 % of the female respondents, as compared to 44% males who preferred banks, followed by, friends/relatives and money lenders. None of the female-headed households preferred self-help groups (SHGs) for credit against 4% male respondents who preferred SHGs for credit.

Table 2: Accessibility to various extension services, trainings, animal health services, market and credit of female and male-headed households (N=100)

Accessibility to various services	Households				χ^2 value
	Female-headed (n=50)		Male-headed (n=50)		
	Accessible	Not accessible	Accessible	Not accessible	
	(%)	(%)	(%)	(%)	
Extension services	20.00	80.00	64.00	36.00	3.920*
Trainings	16.00	84.00	64.00	36.00	23.120**
Animal health services <i>a. Public</i>	40.00	60.00	80.00	20.00	18.000**
<i>b. Private</i>	60.00	40.00	20.00	80.00	18.000**
Market for selling of its produce	42.00	58.00	88.00	12.00	28.880**
Credita. <i>Institutional</i>	20.00	80.00	44.00	56.00	0.720
<i>b. Non institutional</i>	80.00	20.00	56.00	44.00	0.720

**significant at 1% level of significance ($P < .01$), *significant at 5% level of significance ($P < .05$)

Table 3: Preferences of the female and male-headed households for various animal health service providers (N=100)

Service providers	Female-headed households % (n=50)				Male-headed households % (n=50)			
	Vaccination	Deworming	A.I.	Treatment	Vaccination	Deworming	A.I.	Treatment
Block vet. hospital	10.00	12.00	20.00	10.00	64.00	50.00	68.00	32.00
Veterinary institute	—	—	—	—	10.00	—	10.00	10.00
Paravet	34.00	20.00	80.00	20.00	34.00	40.00	22.00	40.00
Quack	56.00	42.00	—	30.00	—	10.00	—	10.00
Traditional healer	—	26.00	—	40.00	—	—	—	8.00

Table 4: Preferences of the female and male-headed households for various credit lending sources (N=100)

Credit lending sources	Female-headed households % (n=50)	Male-headed households % (n=50)
Friends/relatives	80.00	40.00
Banks	6.00	44.00
SHGs	-	4.00
Money lenders	14.00	12.00

CONCLUSION

Livestock health delivery services mostly address the male farmers. Such situation is more worse among females headed households which have poor access to extension services, training and input delivering agencies, as compared to male headed households. Also they had poor access to sell the livestock produce and institutional credit. Thus, priority needs and strategies to be given in accessing the inputs, trainings, livestock extension services, market and credit on soft terms from financial institutions for setting up their small scale dairying and livestock enterprises as per their needs, interest and opportunities to the households, where woman is the main bread earner.

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Economic Assessment and Performance of Bt. Cotton vis-à-vis Popular Non-Bt. Varieties of Cotton

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ABSTRACT

A study was conducted in the important cotton growing districts Ganganagar and Hanumangarh of Rajasthan for economic viability of Bt. cotton and non Bt. cotton varieties. A total of 160 farmers comprising 80 Bt. cotton and 80 non-Bt. cotton farmers drawn randomly from 8 villages in the two districts were included in the study. The results indicated that the number of pesticide sprays has reduced with introduction of Bt. cotton. Cost on pesticide in case of non-Bt. cotton accounted for about 30 per cent of total cost as against 7 per cent in case of Bt. cotton. Bt. cotton farmers earned a larger profit Rs. 35372.48 / ha as compared to non-Bt. cotton farmers Rs. 13398/ha. Highly significant inverse relation of plant protection with profit showed by the chow test suggests over use of pesticides by farmers. In conventional cotton varieties, plant protection management appropriated around one-third of total cost of cultivation. Reduction in usage of pesticide and thereby reducing the cost of cultivation has been the avowed target of deployment of Bt. Cotton. Adopters of Bt. cotton earned an additional income of Rs 21,974 per ha. The higher Benefit Cost Ratio (2.6:1) for Bt. cotton in comparison to non-Bt. cotton (1.6:1) amply showed that Bt. cotton was profitable.

Keywords: Bt. cotton, Non-Bt. cotton, Cost of cultivation, Economic assessment

INTRODUCTION

Indian farmers have a legacy of cotton cultivation. With the largest acreage of about 9 million ha and 15 per cent of global production, India has a strong presence in global cotton production. It plays a significant role in buttressing up the national economy as well as in providing livelihood security to millions of households through direct cultivation, value addition and trade. Indian seed industry is undergoing a period of rapid change, due to economic liberalization and enactment of the new seed policy in 1988. Cotton sector sustains livelihood security of millions of households in the country. However, in the recent past cotton growers have been left high and dry due to colossal loss inflicted by the devastating bollworm insect pest. Mounting cost of cultivation with increased use of pesticide and related recurrent indebtedness have led to acute distress among the cotton growers. Plant protection management in cotton is an indispensable and quite expensive activity for ensuring good harvest. This lifted the restrictions on import of foreign germplasm by private sector, enabling larger seed producers, particularly those with foreign collaborations to have access for seed from

international source (Dhar, 2002). The Bt. cotton is an insect resistant transgenic crop with a gene (*cry 1 ac*), from the bacterium, *Bacillus thuringiensis*, conferring some degree of resistance to lepidopteron pests of cotton notably the potentially devastating bollworm (*Helicoverpa armigera*). In this backdrop, a study was conducted to undertake economic assessment and performance of Bt. cotton vis-à-vis popular non-Bt. varieties of cotton with pesticide sprays.

MATERIAL AND METHODS

The study was conducted in the important cotton growing districts Ganganagar and Hanumangarh of Rajasthan. These districts were purposively selected on account of larger acreage under Bt. cotton cultivation. A total of 160 farmers comprising 80 Bt. cotton farmers and 80 non-Bt. cotton farmers drawn randomly from 8 villages of districts Ganganagar and Hanumangarh constituted the sample for the study. Two blocks namely Ganganagar and Padampur of Ganganagar and two blocks Tibi and Hanumangarh of Hanumangarh were selected purposively considering the acreage of Bt. cotton. From each block two villages were selected

randomly and from each village a group of 20 farmers comprising 10 Bt. cotton farmers and 10 non-Bt. farmers were selected. Descriptive statistical analysis such as mean and percentage were used to study the socio-economic characteristics like age, education, experience, size of holding, family size, awareness about Bt. cotton and adoption of Bt. cotton. Chow test was used to understand the relationship between resource used and profit earned. Benefit-cost ratio was also worked out to know the solvency of Bt and non-Bt cotton cultivation.

RESULT AND DISCUSSION

Plant protection management in cotton is an indispensable and quite expensive activity for ensuring good harvest. In conventional cotton varieties, plant protection management appropriated around one-third of total cost of cultivation. Reduction in usage of pesticide and thereby reducing the cost of cultivation has been the avowed target of deployment of Bt. cotton. A comparative picture of level of pesticide sprays in Bt. and non-Bt. cotton presented in Table 1 shows that the number of sprayings was much lower in case of Bt. cotton than in non-Bt. cotton. About two-third of the Bt. cotton farmers had 1-3 sprays, while 55 per cent of the non-Bt. farmers sprayed more than 5 times. In the study area no Bt. farmer practiced spraying for more than 3 times, on the contrary, in case of non-Bt. cotton 85 per cent farmers sprayed more than 3 times. Similar results were found by Gopal Raj (2002). Bt. cotton farmers reduced pesticide use on an average of 13 sprays per season. The savings in pesticide spraying costs lowered their production costs by 28 per cent. Rampant and imprudent spray of chemicals not only enhanced the cost of cultivation and reduced the profit margin but also impaired the ecological balance with annihilation of bio-agents. It degraded the micro-environment with pollution of soil and water and

Table 1: Average number of spray done by cotton farmers (N=160)

Number of spray	Bt. cotton f (n=80)	Non-Bt. cotton f (n=80)
0	29 (36.3)	0
1 – 3	51 (63.7)	12 (15)
4 – 5	0 (0.00)	24 (30)
More than 5	0 (0.00)	44 (55)
Total	80 (100)	80 (100)

*Figure in parentheses show percentage

damage to soil microbes, flora and fauna. Mayee *et al.* (2002) reported that the recent multi-location trials with GM cotton hybrids in India showed their superiority to conventional hybrids in respect of reduced pesticide consumption and increasing seed cotton yield. Their economic superiority coupled with biological and environmental safety would offer an excellent opportunity to fit into the integrated pest management (IPM) system for the cotton cultivars with inherently excellent fiber properties.

The data on the average cost of cultivation and average net return for Bt. cotton and non-Bt. cotton presented in Table 2 show that the costs involved in land preparation, seed, sowing and irrigation were higher in case of Bt. cotton as compared to non-Bt. cotton. However, the cost on manures and fertilizer were lower in Bt. cotton. As expected in Bt. cotton, the cost on plant protection was around 4 times lower than the non-Bt. cotton. The share of pesticides in total cost was only 7 per cent in Bt. cotton, while it was near one third of total costs of inputs used for non-Bt. cotton.

The share of seed cost to total input costs was about 25 per cent in the case of Bt. cotton, whereas it was less than 4 per cent in the case of non Bt. cotton. However, the savings in pesticide costs compensated the higher seed cost for Bt. cotton. Hence, the total cost of all inputs in non-Bt. cotton was about 2.56 per cent higher (Rs.22196) than the total cost of inputs used in Bt. cotton cultivation (Rs. 21640). The average yield obtained was also higher (28.28 q/ha) in Bt. cotton than in non-Bt. cotton (19.24 q/ha). Findings are similar to the result

Table 2: Cost and net return for Bt. and non Bt. cotton (Rs/ha)

Particulars	Bt. cotton	Non-Bt. cotton
Land preparation	3644(16.83)	2540(11.44)
Seeds	5252(24.26)	780(3.51)
Sowing	2040(9.42)	1596(7.19)
Manures	3140(14.53)	4244(19.12)
Fertilizer application	3240(14.97)	4868(21.93)
Plant protection management	1528(7.06)	6644(29.93)
Irrigation	2796(12.92)	1524(6.86)
Total cost (Rs./ha)	21640(100)	22196(100)
Total yield (quintals/ha)	28.28	19.24
Price (Rs/quintal)	2016	1850
Gross return (Rs./ha)	57012.48	35594
Gross Margin (Rs./ha)	35372.48	13398

* Figures in parentheses indicate percentage

of Venugopal (2001) reported from the trials conducted in India over the years which indicated that the cotton hybrids containing the Bt. gene provided significantly increased yield as compared to their non-Bt. controls at each location tested. The data over all the years show that mean yield performance of all Bt. hybrids was 29-40 per cent higher as compared to the mean yield performance of all non-Bt. controls. As Bt. cotton fetched higher market return (Rs. 2016/q) as compared to non-Bt. cotton (Rs. 1850/q), the per hectare average net return earned for Bt. cotton was higher (Rs. 35,372) as against Rs. 13,398 for non- Bt. cotton. Chow test revealed two variables namely cost on plantation (i.e. cost on land preparation, seed, sowing) and plant protection, as significant in explaining the variability in profit (Table 3). The similar results also found in China, Mexico (Traxler *et al.*, 2001), and South Africa (Thirtle *et al.* 2003) show that the adoption of Bt. cotton leads to higher yields and a marked reduction in pesticide use, which can have substantial environmental and human health benefits.

Table 3: Parameters estimates of chow test for profitability in Bt. and non-Bt. cotton

Variable	Estimate value
Interception	9.2330**
Land preparation, sowing, seed	0.2742*
Manures	-0.1394
Fertilizers	0.1520
Plant protection	-0.4156**
Irrigation	0.0171
R ²	0.522

**Significant at the 0.01 level; *Significant at 0.05 level

The coefficient estimates for manures, fertilizers and irrigation were not found significant. Highly significant inverse relation of plant protection chemicals with profit shows that farmers used more pesticide and they could attain profit by reducing the present level of pesticide application. Need based application of pesticide should be practiced. The R-square value of the estimated test was 0.522 indicating that about 52 per cent of the profit

variability in cotton could be explained by the variables considered in the analysis.

The Benefit Cost Ratio should be more than 1 to reflect the viability and solvency position of the enterprise. Here, the BCR for Bt. cotton was observed higher (2.63) than the non Bt. cotton farmer (1.60). It showed that Bt. cotton farmers earned higher profit per unit investment in comparison to non Bt. cotton farmers (Table 4).

Table 4: Benefit cost ratio of Bt. & Non-Bt. cotton

Farmers	Total cost (Rs.)	Total return (Rs.)	BCR
Bt. cotton	21640	57012.48	2.63:1
Non-Bt. cotton	22196	35594	1.60:1

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An Analysis of Constraints faced by the Farmers in Availing Agricultural Insurance in Punjab

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ABSTRACT

Agricultural insurance has evolved as one of the most important means of indemnifying the losses in crop yields, and hence crop income. Therefore, this study was undertaken to analyse various constraints faced by the farmers who were insured under Weather Based Crop Insurance Scheme (WBCIS) and the livestock insurance in Punjab. Respondents included a total of 124 farmers for weather insurance and 100 farmers for livestock insurance. Data was collected with the help of an interview schedule which consisted of statements to identify the constraints being faced by the farmers. The study brought out that the constraints for weather insurance were much inclined towards the non-popularization of it which limits the full knowledge of the farmers, about various insurance products. Moreover the loss estimation process is still a major constraint though weather insurance is an index based product. Thus, calling for more appropriation of loss estimation process by increasing the number of reference weather station. The livestock insurance constraints were mainly oriented towards the service providers viz., the bank, the veterinary doctors involvement. Thus, calling for more transparency in the procedures which shall ease the farmer and increase their satisfaction in availing the livestock insurance.

Keywords: Agricultural insurance, Livestock insurance

INTRODUCTION

Farmers in India have been observed to be risk-averse and that they seek to avoid risk through various managerial and institutional mechanisms (Binswanger, 1980 and Hazell, 1982). Traditional coping mechanisms and adaptation strategies like drought proofing by mixed cropping, changing varieties, crops and sowing time, matching crop phenology with weather and water availability and diversifying income sources are not always efficient and effective against aggregate climatic shocks and disasters. Agricultural shocks are further amplified in rural areas where financial markets are incomplete and the imperfect land, labour and credit markets are inter-locked. These preconditions dictate the need for formal risk transfer mechanisms like insurance in Indian agriculture. Agricultural insurance has evolved as one of the most important means of indemnifying the losses in crop yields, and hence crop income. Agricultural Insurance brings in security and stability in farm income. Agricultural insurance protects farmers' investment in crop production and thus, improves their risk bearing capacity, facilitating the

adoption of improved technologies and, encourages higher investment resulting in higher agricultural production. Punjab, the epicentre of green revolution has the highest food grain production in the country. With 98 percent irrigated land and hi-tech agricultural practices its agriculture is least prone to any risk or natural calamities. But with the changing scenario, the state's agriculture is no more sustainable and calls for diversification. This requires the cultivation of high value crops other than paddy and wheat. So in this context the need for agricultural insurance arises. Weather Based Crop Insurance Scheme (WBCIS) has been piloted in the state since 2008 but didn't show much success. Keeping an eye on these issues this study was undertaken to analyse various constraints faced by the farmers who were insured under WBCIS and the livestock insurance.

MATERIALS AND METHODS

In this study, the variable constraint was operationalised as the impediments which hinder or restrict the farmers in making full use of agricultural

insurance scheme in Punjab state such as awareness of its various aspects, claim settlement, estimation of loss to claim settlement, estimation of loss to claim ratio. It was measured on a three point continuum viz., always, sometimes and never, and was scored as 3, 2, and 1, respectively. The lists of insured farmers were obtained from different insurance companies which included a total of 124 farmers for weather insurance and 100 farmers for livestock insurance. The insured farmers under weather insurance include; 22 farmers for potato crop by ICICI Lombard, 17 farmers for paddy by Agricultural Insurance Company Ltd. and 85 for paddy by IFFCO Tokio General Insurance Company Ltd. The farmers availing livestock insurance included 40 by ICICI Lombard and 20 each by The New India Assurance Company Ltd., Oriental Insurance Company Ltd. and National Insurance Company Ltd. Data was collected with the help of an interview schedule which consisted of statements to identify the constraints being faced by the farmers.

RESULTS AND DISCUSSION

The data presented in Table 1 shows that a total of 20 problems were enlisted regarding the awareness of weather insurance and its various aspects, premium payment, claim settlement and many others. The

inadequate publicity of the insurance scheme, the less coverage of crops, the less understanding of reference weather station, the forms were not in Punjabi, and there were no service provider/ agent at village or block level to facilitate the understanding the insurance product specifications were the equally ranked at 3.5 with a mean score of 3.00. Since the state has negligible history of crop insurance so the farming community is not much aware of it. But the growing demand has led to the need of this institutional mechanism to avert the farming risk and was piloted in the state in 2008 by both public & private sector insurance companies. Among the public sector, Agricultural Insurance Company has piloted the index based crop insurance in the state with the premium subsidized from both the central and state government. In the private sector, ICICI Lombard General Insurance Company Ltd. has played the role of implementation of weather insurance mainly to the contract farmers. The other company IFFCO Tokio General Insurance Company Ltd. operates through its largest network of cooperatives. Due to these limitations the insurance product are not popularized among the farmers. Language is another important barrier for the understanding of it. Neither of these companies provide the forms in Punjabi, due to which the farmers are unable to understand the insurance policy.

Table 1: Various constraints faced by the farmers in making full use of crop/weather insurance (N=124)

S.No.	Problems	Mean score	Ranks
1.	Less coverage of crops	3.00	3.5
2.	High premium rate	1.86	14
3.	No subsidy in premium	2.72	7
4.	Non awareness about various insurance products	2.00	10.5
5.	No choice of various insurance products to suit one's own farm condition	2.00	10.5
6.	Delayed settlement of claims	1.00	18
7.	Non-satisfactory amount of compensation (Higher/lower/no claim)	1.00	18
8.	Inadequate publicity	3.00	3.5
9.	Complex documentation procedure	2.00	10.5
10.	Lack of cooperation from bank	1.00	18
11.	Schemes do not cover non-loanee farmer	2.00	10.5
12.	Less understanding of Reference weather station	3.00	3.5
13.	All the forms were not in Punjabi	3.00	3.5
14.	No coverage for high risk crops	3.00	3.5
15.	The rules & regulations of the scheme are difficult to understand.	2.00	10.5
16.	Computing the temperature/biomass data is at the district level thus specific pockets do not get compensated.	1.82	15
17.	The whole processing of the policy is very tedious and time taking process	1.00	18
18.	Completion of the bank formalities is time consuming process	1.00	18
19.	No satisfactory reply from the service provider for any query	2.00	10.5
20.	No service provider/agent at village or block level to facilitate the understanding the insurance product specifications	3.00	3.5

Moreover the weather fluctuations are messaged to the farmers registered mobile phone which is also in English, due to which farmers are contrived from the proper understanding of the Reference Weather Station (RWS). The insurance coverage was provided for low risk crops hence the farmer apprehended the use of insurance coverage, since he has a guaranteed income of it. Hence less coverage crops was another important constraint for the farmers in the reaping up of the weather insurance. Another major constraint being faced by the respondents is the non-availability of the service provider/ agent at village or block level to facilitate the understanding of the insurance product specifications which is ranked 3.5 with mean score of 3.00.

Since the insurance product was mainly serviced in the state by the private role players there was no subsidy in the premium amount. Hence it was ranked as seventh major problem by the respondents with mean score of 2.72. The non-awareness regarding various insurance products gave no choice to the farmers to choose the one suiting to one’s own farm condition; and this constraint was ranked at 10.5 with a mean score of 2.00. The complex procedure of

documentation, non-availability of the insurance scheme to non-loanee farmers, difficulty in understanding the rules and regulations of the scheme and non-satisfactory reply from the service provider for any query were equally ranked as 10.5 with mean score of 2.00. Next to these is the constraint of computing of the temperature/ biomass data is at the district level ranked as fifteen, with mean score of 1.82; due to which specific pockets do not get compensated. The delayed settlement of claims was ranked as eighteenth major constraint with a mean score 1.00. This problem is ranked low as there is very less amount of claims. The non-satisfactory amount of compensation, lack of cooperation from bank, the time taking process of whole processing of the policy and the time lag at the end of the bank are the other major problems with a men score of 1.00 and ranked as 18th constraint.

A perusal of the data presented in Table 2 gives an insight to various constraints being faced by the respondents in the availing up of the livestock insurance. The time consuming process of the completion of bank formalities was the major constraint being faced by the respondents since all the farmers availed cattle loan from the bank in which the cattle

Table 2: Various constraints faced by the farmers in making full use of livestock insurance (N=100)

S.No.	Constraints	Mean score	Ranks
1.	Maintenance of ear tag for the livestock insurance is difficult.	3.00	7
2.	High premium rate	2.00	18.33
3.	No subsidy/subsidy in premium is inadequate	2.00	18.33
4.	Non awareness about the various insurance products	3.00	7
5.	No choice of various insurance products to suit to the one’s own farm condition	3.00	7
6.	Delayed settlement of claims	2.00	18.33
7.	Non-satisfactory amount of compensation (Higher/lower/no claim)	1.00	22
8.	Inadequate publicity	3.00	7
9.	Complex documentation procedure	2.72	17
10.	Lack of cooperation from bank	2.80	16
11.	Schemes do not cover non-loanee farmer	3.00	7
12.	The veterinary practitioner is often not available	3.00	7
13.	All the forms were not in Punjabi	3.00	7
14.	Maintenance of the documents for the claim of loss is cumbersome	2.86	14
15.	The rules & regulations of the scheme are difficult to understand.	3.00	7
16.	Procuring certificates from the Veterinary Practitioner is a time taking process	2.86	14
17.	The whole processing of the policy is very tedious and time taking process	3.9	1
18.	Completion of the bank formalities is time consuming process	3.10	2
19.	No satisfactory reply from the service provider for any query	2.88	12
20.	No service provider/agent at village or block level to facilitate the understanding the insurance product specifications	3.00	7
21.	Mal practices in procuring the certificates from Veterinary practitioner	2.86	14
22.	The insurance inspector does not arrive timely when the death of animal is reported.	1.58	21

insurance is compulsory. The second major problem is also related to the banking procedure with a mean score of 3.10. The maintenance of ear tag, inadequate subsidy amount, no choice of various insurance products to suit one's own farm condition, non-awareness about the various insurance products, inadequate publicity, Non-coverage of insurance scheme for non-loanee farmers and the non-availability of the veterinary practitioner were the next major problem ranked as 7 with a mean score of 3.00. The non-satisfactory reply of the service provider for any query being raised was as 12th problem with an average score of 2.88. Three constraints; the malpractices and much of the time consumed by the veterinary practitioner to issue the health certificates and the maintenance of documents for claim, were ranked at 14th with a mean score of 2.86. The next in line were constraints faced at the bank by the respondents with mean score of 2.80 and 2.72, respectively. Since the premium was subsidized it was not a major constraint and claim settlement was also ranked equally at 18.33 with a mean score 2.00. Though the problem of issuing of health certificate was seen as a major problem by the respondents but during the claim settlement their cooperation was ranked as the last one at 21st, indicating that it was not a problem for claim settlement procedure. Thus, it can be said that claim settlement procedure is comparatively easy and less time consuming. This can be due to the reason that claim settlement is essential for the closure of the bank loan which instigates the banks to hasten the procedure since it stands at the receiving end.

CONCLUSION

It can well be concluded that both the components of agricultural insurance viz., weather and livestock insurance had varied problems. The constraint for weather insurance is much inclined towards the non-

popularization of it which limits the full knowledge of the farmers, about various insurance products. Moreover the loss estimation process is still a major constraint though weather insurance is an index based product. Thus, calling for more appropriation of loss estimation process by increasing the number of reference weather station. The livestock insurance constraints were mainly oriented towards the service providers viz., the bank, the veterinary doctors involvement. Thus, calling for more transparency in the procedures which shall ease the farmer and increase their satisfaction in availing the livestock insurance. The popularization of the product should be done in such a way that even the non-loanees farmers should also avail the scheme for insuring of their livestock, thus, avoiding any major loss to their income. This calls for insurance education among the farming community, when our rural India is floating in the era of financial inclusion. A separate desk in various financial institution should be created to make it a felt need among the farming community so as to assure that their source of income (crops and livestock) do not suffer from any major loss due to unavoidable circumstances. Awareness level can be increased regarding the agricultural insurance by giving wide publicity through the mass media.

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Constraint Faced By Village Leaders in Dairy Development Activities

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ABSTRACT

This study was conducted on 150 village leaders selected from 30 villages of 3 talukas with 5 respondents from each village of Hingoli district of Maharashtra state to ascertain the personnel and socio-economic characteristic, Overall distribution of village leaders according to their role performance in dairy development activities, their relationship and constraints faced by village leaders in dairy development activities. The respondents were personally interviewed with a specially designed interview schedule. The study reveals that majority of the village leaders were found in middle age category, educated upto secondary school, form open category, had agriculture major occupation, medium income group, had big land holding, medium size family, from nuclear family, medium social participation had high exposure to sources of information followed, had medium herd size, received medium training. The correlation between role performance with education, occupation, annual income, land holding, family size, family type, social participation, sources of information, herd size, training received was positive and significant while age and cast had negative and non-significant relationship. Regarding overall distribution of the village leaders play medium role performance in dairy development activities, followed by low and high role performance. The majority of the village leaders expressed inadequate loans supply, high cost of shed construction for animal keeping, lack of availability of labour, Lack of artificial insemination technology and veterinarians.

Keywords: Village leaders, Constraints, Dairy development activities, Overall distribution, Role performance

INTRODUCTION

Dairy is an integral part of rural agricultural economy. It is a potential source of gainful employment generating additional income to rural poor, dairy farmers, and particularly landless farm laborers, marginal and small farmers who are resource deficit. Dairy has provided strong support to farmers. In order to encourage more and more people to take up dairy as an enterprise, it is essential that milk production becomes an economic proposition (Taneja and Bhat, 1987). India is in a commanding position on livestock map of the world. India has the large number of breeds of cattle (26), buffalo (7), goat (20) and sheep (40) in the world. It indicates that India has richest germplasm of livestock of the world (Varma and Sharmam, 2002). The role of leader has gained increasing importance in democratic societies. Reddy (1967) concluded that people approach the leaders of their village to solve several of their problems. He also stressed that no substantial

improvement would be attempted without the co-operation of village leaders in developmental activities. Dasartha Ranaih (1976) revealed in his study that the success or failure of rural development programmes depends much upon the capabilities of local leaders. Developmental activities depend upon the integrity of extension workers and co-operation in decision making is given by the local leaders. It seems, therefore, that so as to understand the rural leadership many questions are not still fully answered. Thus, the present study attempted to explore the socio-economic profile, overall distribution of village leaders, their relationship and constraints faced by village leaders in dairy development activities in the Hingoli district of Marathwada region of Maharashtra state.

MATERIALS AND METHODS

The present study was conducted in Hingoli district of the Marathwada region in Maharashtra state. Hingoli

district is vulnerable to have considerable sample of formal leaders. Hingoli district is comprised of five talukas namely Hingoli, Basmat, Aundha, Kalamnuri and Sengaon. Out of which three blocks i.e. Hingoli, Aundha and Kalamnuri were randomly selected where NDDDB and BAIF milk procuring centres and network project on dairy development. Ten villages from each taluka were randomly selected for the present study, formal leader of the village was considered as a respondent. For identification of formal leader positional approach was used. From each selected village, sample of five formal leaders was selected randomly. Thus total sample of 150 formal leaders were selected randomly from 30 villages of three talukas of Hingoli district. Data was collected through a pre-tested and well-structured interview schedule. Specially designed interview schedule relevant to objectives of the study was used to collect the data by personal interview method, which, contain relevant questions on socio-economic and personal characteristics of respondents, overall distribution of village leaders, and relationship and constraint faced by them in dairy development activities in the village. The data were tabulated and analyzed by employing statistical methods like frequency, percentage, mean, standard deviation, coefficient of correlation and multiple regression analysis.

RESULT AND DISCUSSION

The data presented in Table 1 indicated that 72.66% of the respondent belonged to middle age category, 54.66% leaders were educated upto secondary school, 60.00% leaders were from open category. In case of occupation 46.67 per cent leaders had agriculture, had medium income group 90.00% was dominated followed by high 8.00% and low 2% income level, having 54.00% big land holding. In case of size of family 58.66% had medium size family, had 68% of leaders with nuclear family, having 70.66% of medium level of social participation. Regarding sources of information 63.33% leaders had high exposure, with 89.33% leaders belonged to medium herd size along with they had received medium training (76.00%).

The data presented in Table 2 indicated that village leaders 68.66% had medium role performance in dairy development activities followed by low 16.67% and high 14.67% role performance in dairy development activities. The village leaders are moderately activated and working with medium devotion to social work. Village leaders have to be provided with resources for

Table 1: Distribution of respondent according to their personnel & socio-economic profile (N=150)

Attributes	Frequency	%
Age		
a) Young (up to 32 years)	20	13.34
b) Middle (32 to 50)	109	72.66
c) Old age (51 and above)	21	14.00
Education		
a) Illiterate	5	3.33
b) Can read/Write only	10	6.66
c) Primary School (up to 4 th std.)	33	22.00
d) Secondary school (5 th to 10 th std.)	82	54.66
e) Higher secondary school (11 th and 12 th std.)	14	9.34
f) Graduate (above 12 th std.)	4	2.67
g) Post graduate	2	1.34
Caste		
a) SC	17	11.34
b) ST/NT/SBC	18	12.00
c) OBC	25	16.66
d) OPEN	90	60.00
Occupation		
a) Labour	15	10.00
b) Caste occupation	17	11.33
c) Agriculture	70	46.67
d) Agriculture + Caste Occupation	13	8.67
e) Agriculture + Agriculture related business	33	22.00
f) Agriculture + service	2	1.33
Annual Income		
a) Low (Upto Rs. 13,044)	3	2.00
b) Medium (Rs. 13,045 to Rs. 1,09,628)	135	90.00
c) High (Rs. 1,09,629 and above)	12	8.00
Land holding		
a) Marginal (Below 1.0 ha)	19	12.66
b) Small (1.01 to 2.00 ha)	5	3.34
c) Semi medium (2.01 to 4.00 ha)	13	8.66
d) Medium (4.01 to 10.00 ha)	32	21.34
e) Big (10.01 and above)	81	54.00
Size of family		
a) Small (upto 5)	55	36.67
b) Medium (6 to 10)	88	58.66
c) Big (11 and above)	7	4.67
Type of family		
a) Joint (2)	48	32
b) Nuclear (1)	102	68
Social Participation		
a) Low (upto 6)	27	18.00
b) Medium (7 to 23)	106	70.66
c) High (24 and above)	17	11.34
Sources of information		
a) Low (Upto 7)	29	19.33
b) Medium (8 to 12)	95	63.33
c) High (13 and above)	26	17.304
Herd size		
a) Low herd size (Upto 1)	9	6.00
b) Medium herd size (2 to 8)	134	89.33
c) Big herd size (9 and above)	7	4.67
Training received		
a) Low (upto 1)	27	18.00
b) Medium (2 to 4)	114	76.00
c) Big (5 and above)	9	6.00

village development related to participation in dairy development activities gives recognition to village leaders. Agriculture and dairy farming is the major concern of village life the role performance of an individual is usually related with education, social participation, training received, sources of information, etc. as a result of this village leaders perform better role in dairy developmental activities. These findings are in line with Khare *et al.* (1997), Shirke *et al.* (2001) and Bhongale (2007).

Table 2: Overall Distribution of respondents according to their role performance in dairy development activities (N=150)

Category	Frequency	Percent
Low (upto 48)	25	16.67
Medium (49 to 111)	103	68.66
High (112 and above)	22	14.67

An attempt has been made in the present study to find out the relationship between the characteristic of respondents with their role performance in dairy development activities. The data were subjected to correlation analysis. It was observed from table 3 that education, occupation, annual income, land holding, family size, family type, social participation, sources of information, herd size, training received revealed positive and significant relationship with role performance of village leaders. While the age and caste of village leaders was found negative relationship with the role performance. The present results were supported by Garje (1997) and Jadhav (2004).

Result from Table 4 showed that selected twelve independent variables explain the variation in role performance of village leaders in dairy development activities to the extent of 86.80 per cent, the remaining variation to the extent of 13.20 per cent may be attributed to the variables which were not included in the study. The factors like education, family size, social participation, sources of information, herd size, training received were observed to be crucial in determining the variation in role performance.

It was observed from Table 5 that majority of the respondents 80% expressed inadequate loans supply, this might be due to non repayment of loan by the respondents and due to non-repayment attitude bankers are not ready to give loan for dairy farming. While 74% of the respondents opined that high cost for shed

Table 3: Relationship between the selected independent variables with dependent variable (N=150)

Independent variables	'r' values
Age	0.074NS
Education	0.519**
Caste	-0.081NS
Occupation	0.480**
Annual income	0.735**
Land holding	0.331**
Family size	0.548**
Family type	0.360**
Social participation	0.813**
Sources of information	0.648**
Herd size	0.649**
Training Received	0.720**

*Significant at 0.05% level of probability (P < 0.05);
 **Significant at 0.01% level of probability (P < 0.01)

Table 4: Multiple regression analysis of role performance of village leaders about dairy development activities

Independent variables	Bi value	SE	Calculated 't' Value
Age	-0.706	0.142	-4.940**
Education	4.720	1.373	3.438**
Caste	-7.839	1.147	-6.833**
Occupation	0.981	0.724	1.353NS
Annual income	0.069	0.056	1.229 NS
Land holding	0.083	0.365	0.228 NS
Family size	1.536	0.672	2.285**
Family type	1.619	2.474	0.654 NS
Social participation	2.199	0.220	9.990**
Sources of information	1.222	0.667	1.830*
Herd size	-4.514	0.766	-5.887**
Training Received	7.249	1.123	6.451**

*Significant at 0.05 level of probability; **Significant at 0.01 level of probability; NS = Non-significant. R² = 0.868

construction for animal keeping, this might be due to increase in prices of material required for shed construction. Similarly 69.33% of the village leaders expressed that lack of availability of labour, out of total samples majority of the respondents belonged to big land holding and respondents giving priority to other agriculture practices and are not finding sufficient time for dairy farm activities. Whereas considerable number of respondents 65.33% stated that other selfishness during decision making, lack of appreciation for work done was reported by 61.33% of the respondents. These findings were found in line with Natchimuthu and

Table 5: Constraints faced by village leaders in dairy development activities

Constraints	Frequency	Percentage	Rank
Inadequate loans supply	120	80.00	I
High cost of shed construction	111	74.00	II
Lack of availability of labour	104	69.33	III
Other selfishness during decision making	95	65.33	IV
Lack of appreciation for work done	92	61.33	V
Heavy cost of high yielding cows and buffaloes	73	48.66	VI
Awareness of animal insurance	65	43.33	VII
Lack of information of about Extension Education Programme	60	40.00	VIII
High cost of concentrate and other fodder	59	39.33	IX
Scarcity of green fodder	58	38.66	X
Non availability of veterinary dispensaries	54	36.00	XI
High cost of medicine	52	35.00	XII
Scarcity of clean water	50	33.33	XIII
Lack of knowledge about diseases and prevention of diseases	46	31.00	XIV
Low frequency of expert visit	45	30.00	XV
Inadequate training facility	42	28.00	XVI
Low risk bearing capacity	41	27.33	XVII
High wages of labours	38	25.33	XVIII
Lack of training on milk production at village level	37	25.00	XIX
Lack of artificial insemination technology and veterinarians	33	22.00	XX
Availability of grazing land	30	20.00	XXI
Lack of availability of marketing system	22	15.00	XXII
Low demand for cow/buffalo milk in market	18	12.00	XXIII

Ramkumar (2004) and Paul (2008). As regards to other problems 48.66% of the respondents stated that heavy cost of high yielding cows and buffaloes. Similarly 43.33% of the respondents expressed concern of awareness of animal insurance. 40% of the respondent faced Lack of information about Extension Programme as constraints, while 39.33% of the respondent had experienced high cost of concentrate and other fodder and Scarcity of green fodder was faced by 38.66% of the respondents. Non availability of veterinary dispensaries were reported by 36.00% of the respondent. High cost of medicine was reported by 35.00% and 33.33% of the respondents reported scarcity of clean water as constraints, while lack of knowledge about diseases and prevention of diseases, low frequency of expert visit, inadequate training facility, low risk bearing capacity, high wages of labours and lack of training on milk production at village level was reported by 31%, 30%, 28%, 27.33%, 25.33%, and 25% of the respondents respectively, while Lack of artificial insemination technology and veterinarians, availability of grazing land, Lack of availability of marketing system, Low demand for cow/buffalo milk in market were reported by 22%, 20.00%, 15% and 12% of the respondents.

CONCLUSION

The findings led to conclude that majority of the leaders were from middle age, educated up to secondary school, belong to open caste, agriculture as their main occupation, medium level of income with big land holding. Majority of the leaders belongs from medium size of family with nuclear type of family, medium social participation, source of information, herd size and training received. Regarding overall distribution of village leaders majority of the leaders belonged to medium category of role performance in dairy development activities, while the smallest number of leaders belonged to low and high role performance in dairy development activities. Education, occupation, annual income, land holding, family size, family type, social participation, sources of information, herd size, training received revealed positive and significant relationship with role performance of village leaders. While age and caste of village leaders was found negative relationship with the role performance. It was further revealed that education, family size, social participation, source of information and training received showed significant contribution on role performance. The majority of the village leaders expressed inadequate loans supply, high cost of shed

construction for animal keeping, lack of availability of labour, lack of artificial insemination technology and veterinarians.

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Ergonomic Assessment of Farm Women Performing Weeding and Winnowing Operations

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ABSTRACT

In present study impact of work related risk factors of weeding and winnowing operations on anatomical body structure of female was assessed in term of muscular and postural stress. Muscular and postural stress were observed higher in weeding operation as compared to winnowing operation. It may be due to squatting posture adopted by females during weeding operation.

Keywords: Muscular stress, Postural stress, Squatting posture, Standing posture

INTRODUCTION

Agriculture is the largest industry in India and women participate in almost all agricultural operations such as transplanting, weeding, threshing etc. Women constitute 50 per cent of the agricultural work force in India giving India the highest degree of female participation in agriculture (Tamiliselivi and Undamn, 2000). The nature of agricultural work is diverse. It is physically demanding involves external time constraints and experiences, rapid changes in environment and tasks. Rigorous nature of farm work exposes workers to a number of risk factors that have been associated with musculoskeletal disorders, heavy lifting, working in awkward positions for a prolong period of time and poorly designed tools and implements take a toll on both farmers and farm work and make musculoskeletal problems, the most commonly reported health problems. Except farm work, farm women have to perform household tasks as well as livestock work. Triple burden of household, livestock and farm work make the farm women more vulnerable to musculoskeletal disorders. The application of ergonomics principles facilitate the work place conditions and job demands to the capabilities of working population. A goal of ergonomics is to design facilities, furniture's, equipments, tools, work process and job demands to be compatible with human capacities and limitations. In present study, therefore, an attempt was made to find out the effect of two selected activities- weeding and winnowing on anatomical and physiological body of the female farmers in terms of muscular and postural stress.

MATERIALS AND METHODS

Study was conducted at students instructional farm of C.S.A.U.A.&T., Kanpur. Fifteen physically fit farm women were select for the study. Postural deviations in lumber region of farm women was assessed through flexi curve. Time spent in different posture was recorded with the help of stop watch. Musculoskeletal problems were measured through five point scale and stethoscope was used for measuring heart rate. Muscular stress was measured through grip dynamo meter by assessing percentage change in grip strength of both the hands. Heart rate was measured in split up cycle. Split up cycle consists of three sub-stages-before work, at the work and after the work. At each stage, heart rate was measured four times for the purpose of accuracy.

RESULTS AND DISCUSSION

Table 1 shows that during weeding operations, angle of body deviation in lumber region of farm women was found 25° while working in squatting posture. On the other hand, angle of body deviation in lumber region of farm women, working in standing posture was observed 20° from the normal body curve.

Table 2 depicts time spent by farm women in different postures of their different body parts. From the table it is explicit that during weeding operation, neck and shoulders of the farm women was found tensed due to work for 3.686 hrs.and free and relaxed for 0.314 hrs.while in winnowing operation, 3.219 hrs.spent in tensed due to work and 0.871 hrs in free

Table 1: Postural deviation in lumber region of farm women

Postural Deviation			
Posture		Angle of Body Deviation	
Weeding	Winnowing	Weeding	Winnowing
Squatting	Standing	25 ⁰	20 ⁰

and relaxed posture. Further, elbow of farm women during weeding operation was found tensed due to work for 2.09 hrs, position requires by work for 1.57hrs and free in posture of choice for 0.340 hrs. as compared to 2.07 hrs in tensed due to work,1.573 hrs. in position requires by work, 0.187 hrs free in posture of choice during winnowing operation. During weeding operation, 1.810 hrs was spent by back of farm women

in stooped position, 1.678 hrs in good posture but limited by work, 0.152 hrs in natural posture however, during winnowing operation 1.685 hrs. spent in stooped position, 2.026 hrs in good posture but limited by work, 0.152 hrs in natural posture. Moreover, time spent in free position of legs by farm women was 0.103 hrs. during weeding operation and 1.013 hrs during winnowing operation along with 2.058 hrs and 1.563 hrs in forward position of legs during weeding and winnowing operations as well as 1.839 hrs and 1.424 hrs in backward position of legs during weeding and winnowing operations respectively. Elbows and back of farm women found tense due to work for longer period than during winnowing operation.

From the Table 3 it is clear that after performing weeding operation, majority of farmwomen felt very

Table 2: Mean value of total time spent by farm women in different postures during weeding and winnowing

Body Parts	Postures	Total time spent (4 hours)	
		Weeding	Winnowing
Neck Shoulder	Free and relaxed	0.314	0.871
	Tense due to work	3.686	3.219
Elbow	Free in posture of choice	0.340	0.187
	Arms in position requires by the work	1.570	1.573
Back	Arms tense due to work or joints in a extreme position	2.09	2.07
	In a natural posture.	0.152	0.289
	In a good posture but limited by work.	1.678	2.026
Legs	In a stooped position bend/or/and poorly supported	1.810	1.685
	In free position	0.103	1.013
	Legs forward	2.058	1.563
	Legs backward	1.839	1.424

Table 3: Distribution of the farm women as per feeling of pain in body parts during weeding and winnowing operations

Body Parts	Very Severe		Severe		Moderate		Low		Very Low	
	W ₁	W ₂	W ₁	W ₂	W ₁	W ₂	W ₁	W ₂	W ₁	W ₂
Neck	—	1(2%)	25 (50%)	7(14%)	14(28%)	25 (50%)	9(18%)	12 (24%)	2 (4%)	5(10%)
Shoulder	—	37(74%)	6(12%)	12(24%)	38(76%)	1(2%)	5(10%)	—	1(2%)	—
Upper back	—	48(96%)	—	28(56%)	45(90%)	3(6%)	5(10%)	—	—	—
Upper Arms	5(10%)	—	30(60%)	2(4%)	15(30%)	—	38(76%)	—	—	—
Mid Back	—	40 (80%)	—	—	6(12%)	2(4%)	2(4%)	3(6%)	6(12%)	45(90%)
Lower Arms	21(42%)	28(56%)	27(54%)	10(20%)	—	—	—	—	—	—
Lower Back	30 (6)	—	18(36%)	22(44%)	2(4%)	—	—	—	—	—
Buttock	46(92%)	32(64%)	4(8%)	—	—	3(6%)	—	26(52%)	—	21(42%)
Palms	39(78%)	18(36%)	11(22%)	—	—	—	—	—	—	—
Fingers	18(36%)	28(56%)	12(24%)	15(30%)	—	15(30%)	3(6%)	5(10%)	—	2(4%)
Thigh	10(20%)	27(54%)	25(50%)	4(8%)	10(20%)	4(8%)	3(6%)	10(20%)	—	2(4%)
Legs	3(6%)	15(30%)	27(54%)	21(42%)	17(34%)	21(42%)	3(6%)	10(20%)	—	2(4%)

W₁=weeding operation; W₂ =winnowing operation

severe pain in lower back (60%), buttock (92%), palms (78%) and fingers (36%) followed by severe pain in neck (50%), lower arms (54%), thigh (50%) and legs ((54%), moderate pain in shoulder (76%), upper back (90%), low pain in upper arms (76%). On the other hand, for winnowing operation, majority of farm women felt very severe pain in shoulder (78%), upper back (96%), mid back (80%), lower arms (56%), Buttock (64%), palms (36%), finger (56%) followed by severe pain in lower back (44%), moderate pain in neck 50%) and legs (42%) and very low pain in mid- back (90%).

From the Table 4, it is clear that mean value of different parameters of physical strain namely, A.H.R., T.C.C.W, P.C.W. and E.E. were found highest during the work (A.H.R.=38.18 beats/min in weeding and 33.43 beats/min in winnowing, T.C.C.W.=243.4 beats/min in weeding 222.8 beats/min in winnowing, E.E.=9.53 Kcal/min in weeding and 8.83 Kcal/min in winnowing operation) than during onward (A.H.R.=5.35 beats/min in weeding and 5.38 beats/min in winnowing, T.C.C.W.=35.55 beats/min in weeding 35.47 beats/min in winnowing, E.E.= 6.75 Kcal/min in weeding and 5.9 Kcal/min in winnowing operation) and backward journey (A.H.R.=6.75 beats/min in weeding and 6.03 beats/min in winnowing, T.C.C.W.=38.93 beats/min in weeding 38.07 beats/min in winnowing, E.E.= 7.26

Kcal/min in weeding and 6.80 Kcal/min in winnowing operation in the split –up cycle of the work.

According to Table 4 the mean value of these parameters were greater for weeding operation than winnowing operation. It is also evident that during onward and backward journey the mean value of these parameters were almost similar for both the activities. On the basis of the results of Table 1, 2, 3 and 4. It can be concluded that the level of postural stress was more during weeding than winnowing operation. It was because of greater angle of deviation in lumber region of spine from the normal body curve, most of time

spent in tensed working posture and higher values of different parameters of physical strain during weeding.

From the Table 5 it reveals that percentage change in grip strength of both hands was found more during winnowing operation. Except it in winnowing operation the grip strength of both hand were almost same as compared to weeding operation. Positive sign showed that grip strength was increased after the activity. It may be due to the warming up of muscles at the start of activity. Since the duration of milking activity was short in present study, so the strength of grip muscles might have been increased due to this. Bimla *et al.* (2001) also observed that grip strength increased up to 9-6 percent in the first cycle of picking cotton whereas it decreased by 14.2 percent at the end of the activity being done for above 5 hours. It is obvious from the results that grip muscles was used more during winnowing operation than weeding operations. Due to this reason musculo-skeletal problems was found more in upper arm and upper back of farm women after the winnowing operations.

CONCLUSION

On the basis of findings of the study, it is evident that weeding and winnowing both were strenuous activities but weeding was some what more strenuous than winnowing due to the squatting posture adopted during the activity. Biomechanical research shows that high

Table 5: Percentage change in grip strength (kgs) of the subjects after weeding and winnowing activity

Activities	Percentage change in grip strength	
	Left	Right
Weeding	+9.98	+15.99
Winnowing	+17.45	+18.23

No Percentage change in grip strength was found after onward and backward journey of weeding and winnowing operation.

Table 4: Mean value of different parameters of physical strain during 3 phases of weeding and winnowing operation

Particulars	A.H.R.		T.C.C.W		E.E	
	Weeding	Winnowing	Weeding	Winnowing	Weeding	Winnowing
On ward journey	5.35	5.38	35.55	35.47	6.75	5.9
At the work	38.18	33.43	243.4	222.8	9.53	8.83
Backward journey	6.75	6.03	38.93	38.07	7.26	6.80

A.H.R = Average Heart rate, T.C.C.W. = Total cardiac cost of work, E.E. = Energy expenditure

spinal compression forces occur in squatting/stooped postures and that sustained or repeated flexion of the spine may disturb the neuro-muscular stability of the lower back and increase the risk of fatigue leaving the back more vulnerable to injury. Further It was noted that intra discal pressure is higher in sitting than standing posture (Nechamson and Eljstrom, 1970). Hence there is a great need of ergonomic intervention for reducing the work stress of weeding and winnowing operation in terms of postural and muscular stress of farm women through developing appropriate tool and techniques for creating a fit between physical capacity of farm women and work requirement as well as eliminating the risk factors of weeding and winnowing operations responsible for occupational health hazards among farm women.

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Varietal Performance of Soybean at Farmer's Field under Front Line Demonstration Oil Seed *Kharif* in District Mandsaur Madhya Pradesh

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ABSTRACT

The present study was carried out to know the gap between improved packages of practices in soybean crop. Front line demonstration on soybean varieties J.S. 9305 and J.S. 95-60 were conducted at farmer's field in the adopted villages of district Mandsaur (M.P.) during the year 2007 to 2011. On the basis of five years overall average 25.33 percent higher grain yield was recorded in under front line demonstration as compared to farmers practices. The average extension gap was recorded 411 kg/ha between demonstration yield and farmers practices yield. Economic analysis of front line demonstration additional overall average net return and overall average effective gain were found Rs 8008 and Rs. 7033/ha. This gain showed that improved package would be in favour of not only increase the yield of crop but also economic condition of the farmers of district on five year overall average basis benefit : cost ratio was much higher in front line demonstration (3.59) as compared to farmers practices (3.09). An average additional investment of Rs. 975/ha coupled with scientific monitoring of front line demonstration and non monitoring factors were resulted in additional return of Rs. 8008/ha.

Keywords: Front line demonstration, Soybean, Grain yield, Economic analysis & farmers practices

INTRODUCTION

The present average yield of Soybean are just about 1.0 tonnes per ha. Which need to be increased to at least 1.5 tonnes/ha by 2015 (Hegde, 2005) and this indicating the shortfall which is to be minimized either by increasing the area under oilseeds or by increasing the productivity level of oilseeds. Soybean cultivation in India has gained momentum in oil front with the steady increase in the area and production. In recent years, it has become an important oilseed crop of our country, occupying the third place next to groundnut, rapeseed and mustard in area and production. This crop has a greater potentiality to substitute different oilseeds to overcome the shortage of edible oil and protein rich food. Soybean is one of the oldest cultivated crops of the world. Soybean is known as "Golden bean", "Miracle crop" etc., because of its several uses. Soybean besides having high yield potential (30-35 q/ha), Provides cholesterol free oil (20%) and high quality protein (40%). It is a versatile crop with innumerable possibilities of improving agriculture and supporting

industry. The soybean protein is rich in Lysine (4-6%) and the oil extracted is edible one. India is in short supply of proteins and large portion of the population are vegetarians, under this situation crop like soybean with high protein content and high yield potential became an important crop in India. Soybean protein is receiving more attention than any other source of protein today. Besides, it contains several vitamins, calcium, phosphorous and iron. They are ideally suited for human beings. Food uses of soybean include beverages; fermented products like soya sauce and cheese. Small quantities of soybean flour are already being used in baked goods, primarily biscuits and in snacks. Soya flour is also used in substantial quantity in place of besan in sweets, pappads and similar products. *Soybean* is the one oilseed crop in the world has recently occupied an important place in the edible oil and agricultural economy of the country. Its inclusion in the cropping system of the country in general and in the states of M.P., Maharashtra and Rajasthan particular has resulted in improvement of socio-economic status of farmers and provided

employment in villages as well as in adjoining cities where soya based industries is located. Adoption of soybean farming in M.P. It filled in a gap in Kharif season. Being more remunerative than other crops, it raised the income levels of the farmers as also living standard. Under front line demonstration important techniques were demonstrated at farmer's field for showing better result over to farmer's practices.

MATERIALS AND METHODS

Krishi Vigyan Kendra, Mandsaur has conducted 65 Front Line Demonstration under FLD *kharif* during 2007 and 2011 at five different villages, namely Guradia Dida, Udpura, Surkheda, Lasudawan and Barkhedadev Dungari located in different blocks, namely Mandsaur, Sitamau and Malhargarh, respectively under K.V.K. operational area in order to demonstrate the production potential benefits of latest technology to the farmers field. The area under each demonstration was 0.4 ha (1 acre). Total 65 adopted farmers were selected who had been earlier selected and had actually undertaken the demonstration on their fields and data were collected with the help of personal contact and observation. Yield data was also recorded at the time of separate threshing. The yield of each demonstration was recorded in a

systematic manner and the yield of farmers' practices was also recorded at the same time. The date regarding yield and other parameters were collected personally from farmers after every crop harvest through structured interview schedule. The grain yield of demonstration crop was recorded & analysed. Different parameter as suggested by Yadav *et al.* (2004) was used for calculating gap analysis, costs & return.

RESULTS AND DISCUSSION

In front line demonstration plots, use of quality seeds of improved varieties, line sowing and timely weeding, need based of pesticide as well as balanced fertilization (using micronutrient sulphur) were emphasized and comparison has been made with the existing practices (Table 1). The necessary step for selection of site and farmers, layout of demonstration etc. were followed as suggested by Choudhary (1999). The traditional practices were maintained in case of local checks area, production and productivity of soybean Mandsaur district and Madhya Pradesh show in Table 2. Total as front line demonstration was conducted at farmer's field in adopted villages of Mandsaur district during the year 2007 to 2011.

Table 1: Comparison between demonstration package and existing farmers practice under soybean

Particular	Demonstration package	Farmers Practice
Farming situation	Rainfed light black soil	Rainfed light black soil
Variety	J.S.9305 and J.S.9560	Use Local old J.S.335 seed
Time of sowing	25 June-7 July (as per sufficient rainfall)	25 June-7 July (as per sufficient rainfall)
Method of sowing	Line sowing with use seed cum fertilizer drill	Line sowing with use seed drill
Seed rate	78 kg/ha	100-110 kg/ha
Fertilizer dose	As per recommendation after soil testing	In balance use of fertilizers
Plant protection	Soybean seeds are treated with Bavistin 1 g + 2 g thiram for every kg of seeds and spray of recommended insecticides for control of insect-pest.	No seed treatment before the sowing

Table 2: Soybean scenario (area, production and productivity) of the district and state

Year	Area (000' ha)		Production (000' tonnes)		Productivity: kg/ha	
	Mandsaur	M.P. state	Mandsaur	M.P. state	Mandsaur	M.P. state
2007-08	255.9	5201.7	216.3	5368.0	845	1033
2008-09	259.1	5295.1	237.3	5924.0	916	1120
2009-10	262.6	5453.7	184.1	6427.9	701	1180
2010-11	261.5	5552.2	254.7	6776.8	974	1222
2011-12	264.29	5669.0 (FFC)	303.93	6280.6 (FFC)	1150	1109 (FFC)
Average (mean)	260.68	5434.34	239.27	6155.46	917.2	1132.8

The data in Table 3 clearly showed that higher yield (25.0 q/ha) was obtained of the variety of J.S. 95-60 during the year 2009, while, in case of farmers practice it was only 17.00 q/ha. The increase demonstration was 17.88 to 38.71 percent than farmers practices on the basis of five year overall average 25.33 percent yield advantage was recorded under demonstrations carried out with improved package of practices as compared to cultivation of soybean through farmers practices. The average yield was fluctuated from 15.89 to 23.58 q/ha during the years (2007 to 2011), while it was 12.90 q/ha to 17.00 q/ha in farmers practices during the corresponding years on the basis of overall average yield of demonstration was 19.45 q/ha, as compared to 15.34 q/ha in farmers practice.

This finding is an agreement with those of Dayanand *et al.* (2012) and Anil Kumar *et al.* (2010) who had found on overall basis increased. Yield 15.90 percent (Mustard) and 13.0 percent (pear/millet), respectively in front line demonstration at farmer's

fields. The fluctuation in yield has been found 18.50 to 25.0 q/ha in case of JS 95-60, while it was 15.30 q/ha to 16.50 in case of JS 93-05. This fluctuation in yield might be due to early withdrawal of Monsoon so the farmers have been benefitted by the early maturity of soybean variety J.S. 95-60 as compared & JS 93-05. Average yield of (3years basis) JS 95-60 was found in front line demonstration 21.77 q/ha, while it has been seen only 15.97 q/ha in case of soybean variety JS 93-05. Due to higher yield of JS 95-60 at farmer's field is appeared by the farmers of district and gained popularity day by day in the district. This incremental in yield might be due to varietal performance in the district along with other factors i.e. improved seed of crop, seed inoculation With Rhizobium culture, seed treatment with Carbendazim or Thiram adoption of timely management of weeds through recommended weedicides. It could be said that adoption of full package of practice by the farmers not only increased the production but also improve the social status of

Table 3: Impact analysis of grain yield of front line demonstration of soybean in adopted village

Year	No. of Demo	Varieties	Area (ha)	Demo. Max. yield (kg/ha)	Demo. Mini. yield (kg/ha)	Demo. Avg. yield (kg/ha)	Check yield (kg/ha)	% yield increase	Yield gap (kg/ha)
2007	13	J.S. 93-05	5.0	1650	1550	1605	1290	20.00	315
2008	13	J.S. 93-05	5.0	1650	1530	1589	1348	17.88	241
Mean				1650	1540	1597	1319	18.94	278
2009	13	J.S. 95-60	5.0	2500	2200	2358	1700	38.71	658
2010	13	J.S. 95-60	5.0	2350	2000	2177	1677	29.58	500
2011	13	J.S. 95-60	5.0	2100	1850	1996	1657	20.46	339
Mean				2316.67	20.16	2177	1678	2958	496.33
Overall average				20.50	18.24	19.45	1534	25.33	4106

Table 4: Economic analysis of front line demonstration of soybean in adopted villages

Year	Cost of input (Rs./ha)		Additional cost in demo (Rs./ ha)	Net return (Rs./ha)		Additional net return (Rs./ha)	Effective gain (Rs./ha)	B.C. ratio	
	Demo	Check		Demo	Check			Demo	Check
2007	8790	7790	1000	23310	18010	5300	4300	2.65	2.31
2008	10895	9600	1295	21074	17148	3926	2631	3.06	2.94
Average	9842.5	8695	11475	22192	17579	4613	34655	2.85	2.62
2009	11895	10900	995	35265	23700	11565	10570	3.96	3.12
2010	12150	11215	935	31990	22600	9390	8455	3.58	2.99
2011	13100	12450	650	48776	38917	9859	9209	4.72	4.12
Average	12381.6	11521.66	860	38677	28405.66	10271.33	9411.33	4.08	3.41
Overall average	11366	10391	975	32083	24075	8008	7033	3.59	3.09

farmers by more economic net return. Extension activities i.e. training, field days, Kisan Sangosthi, Kisan Mela etc. have. Organised in the adopted villages played a vital role in the dissemination of technology in surrounding villages and district also through diffusion effect. These extension activities have been under taken to reduce the technology gap.

Economic analysis of different variables like seed fertilizer, Bio fertilizers, ploughing, weedicides & pesticides were considered as cost of cultivation for the demonstration as well as farmers practices on an overall average an additional cost of Rs 975/ha was made under demonstration has returned Rs 4613 and 10271/ha, respectively (Table 4). This clearly reflected that farmers got more additional return from the soybean variety JS 95-60 than the variety of JS 93-05 in different location of farmer's fields. The overall average incremental Benefit: cost Ratio (IBCR) were 3.5 q and 3.09 in technology demonstration and farmers practices, respectively. The result to confirm the finding of front line demonstration on oilseeds and pulse crop by Yadav *et al.* (2004) & Lathwal (2010).

It has been also observed that average Benefit: Cost ratio was higher (4.08) if soybean variety JS 95.60 as compared to JS 93-05 (2.85). On JS 95-60 was found more economically profitable than the corresponding variety in the Mandsaur district due to climate change and short duration. Soybean variety JS 95-60 now a days has been appreciated by the farmers of district due to more economic gain period (80-85 days) in case of early withdrawal of monsoon. About sixty percent area has been covered by JS 95-60 variety of Mandsaur district. On the basis of overall average performance of front line demonstration the net return was recorded Rs 32083/ha in the demonstrated technology, while it was observed only Rs. 24075/ha in case of farmers practices.

CONCLUSION

Front line demonstration programme was effective tool in changing the attitude develop skill, increase

knowledge and develop enthusiasm toward the improved packaging of practices not only among the adopted farmers but also others those who seen the results of demonstration. This is the best way to sustain the credibility & Reliability of the technology farmers. The average yield of demonstrated, technology (19.45 q/ha) was higher than that of local check (15.34 q/ha). It could be concludes on the basis of results of front line demonstration that yield and net return soybean variety JS 95-60 were further than variety of JS 93-05 in the adopted villages. Therefore extension functionaries of district should dissemination the. Variety JS 95-60 of soybean with full package of practices along efforts should be made to educate the district farmers for efficiently & timely use of technology. The adopted farmers for demonstration acted as a primary source of information dissemination among the farmers of the improved package of practices and also acted as a reliable source of good quality of seed in their locality & surrounding areas for the hex crop. The concept of front line demonstration might e applied for all categories of farmers i.e. marginal small, medium & large. This would be helpful in the removal of the cross sectional barriers of the farming community.

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Study on Training Needs of Agricultural Supervisors in Jaipur District of Rajasthan

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ABSTRACT

Training has been accepted as a very important activity of the extension programmes since the inception of new strategy of agricultural production in India. Training has become an integral part of the entire agricultural development strategy. The technologies are moving so fast that they become obsolete very soon. Hence, the agricultural supervisor must be imparted intensive training programmes to keep their knowledge about farming innovations upto date so that they could perform their functions effectively. Training needs area of agricultural supervisor might vary depending upon their back-ground and several other factors. This study might be of great importance in identifying the areas of training and fixing priorities. A training strategy for agricultural supervisor could also be developed on the basis of findings. This will help in selecting homogenous group of trainees for a particular programme. Hence, the need for strengthening the extension personnel through an effective training programme has become an integral part of the agricultural strategy in India as well as in the state of Rajasthan.

Keywords: Training needs, Agricultural, Supervisors

INTRODUCTION

Extension training is one of the central concerns of agricultural extension. It has two phase; training to agricultural supervisor and training to farmers. The first phases is predicated that the farmers can not be trained without first training of the agricultural supervisor. Training has gained wide acceptability for upgrading the professional competence of different levels of agricultural supervisor. The main objective of training programme is to develop skill and related knowledge of the agricultural supervisor in a shortest period enabling them to utilize the technology for agricultural production effectively.

The agriculture supervisor is the man on the spot who works with rural people to impart practical knowledge to them and the success of the entire development programme depends to a great extent on his performance. Agricultural supervisor being a multipurpose agent at the village level, among all the extension workers, he is in direct day-to-day contact with the farmers and thus, plays a pivotal role in spreading the improved agricultural technology to the farmers. The basic feature of the Training and Visit (T&V) system of

agricultural extension is a systematic programme of training for the agriculture supervisors.

There is a very wide gap between the research and extension with regard to transfer of technology. It is true that the benefit will flow only when the scientific knowledge reaches to the consumers who are the farmers. A number of extension programmes have been introduced in the recent years for the purpose but the Training and Visit system suggested by Mr. Daniel Benor is considered to be the most important one. The job responsibility of agricultural supervisors is of paramount importance in modern times they must have technical skills both in subject matter and communication techniques. This is more relevant today because the agricultural technology is changing at a faster rate and is gradually becoming complex. The agricultural supervisors have to serve as technical guide to the farmers in different subject matter areas pertaining to agriculture and allied subject and identifying these subject matter area in which they need to enhance their competence as perceived by themselves is very vital for planning an in-service training strategy for the agricultural supervisors. The training needs may vary with

the characteristics and experience of the respondents and several factors may be associated with such needs.

The training of agricultural supervisors is not a static but continuous endeavour. The Govt. of Rajasthan has diverted a huge budgetary expenditure and other resources in organizing training programmes for the agricultural supervisors. Facilities are also availed from outside the state (Institute funded by Govt. of India or ICAR). Hence, it should be a regular feature of a programme to evaluate it critically and suggest the measures for improvement. In order to determine the training needs of the agricultural supervisors the relevant areas of training should be probed into and identified in light of the problems faced by them in the field situation. The importance of the present investigation can be further justified on the following ground; Evaluation of course syllabus, factors responsible for effective training. Thus, based on the findings of the investigation, further, more realistic and problem oriented training programmes could be made. Realising the importance of the above facts, the present study entitled "Training Needs of Agriculture Supervisors Under Training and Visit System in Jaipur district of Rajasthan" was undertaken.

MATERIALS AND METHODS

For the selection of trainees (VEWs / Agricultural Supervisor) a list of total agricultural supervisors in Jaipur district was prepared with the help of the officials of agriculture Department, Government of Rajasthan, The Jaipur. Jaipur district comprises 13 panchayat samities. The panchayat samitiwise position of agriculture supervisors as evident from the following table indicates that the number of agriculture supervisors varies from panchayat samiti to panchayat samiti. Hence, 30 per cent of agriculture supervisors from each panchayat were selected by systematic random sampling method in such a way that a total of 67 agriculture supervisors was selected to the study purpose from the grand total of district Jaipur as presented in Table 1.

An in-service training inventory based on available researches in the area, field experiences, job chart of agricultural supervisor (VEWs) and personal discussion with agricultural supervisor (VEWs) was prepared. This consisted of 26 items. The items were arranged against a 3-point scale. The respondents were asked to rate each item in any one of the three response categories, namely most needed, needed, not needed. The ratings given to

Table 1. Distribution of agriculture supervisors according to panchayat samities in Jaipur district

Panchayat samiti	Total No. of Agriculture supervisors	No. of selected Agriculture supervisors
Jhotwara	7	3
Govindgarh	18	6
Amer	12	3
Dudu	21	6
Sambhar	17	5
Sahpura	18	5
Viratnagar	14	4
Jamwaramgarh	20	6
Kotputali	21	6
Sanganer	17	5
Chaksu	17	5
Bassi	23	7
Phagi	18	6
Total	223	67

the items were quantified by assigning scores of 3, 2, 1, for most needed, needed, not needed categories, respectively. The overall training needs of an individual respondents was calculated by a scale called training need quotient (TNQ).

There are a number of subjects taught to the respondents in the training programme. Practical assignment is also attached to each subject along with theory. For ascertaining the relative emphasis on the need of practical and theoretical knowledge of each subject (items), the trainees (VEWs) were asked to assign marks to theory and practical against each item out of 10 marks depending upon their requirement. To test significance attached to theory and practical z 't' test was applied for each item. The total items finally selected were 22.

In order to know the opinion of the agricultural supervisors about the training programme, a questionnaire was especially constructed. Initially, 26 Items were selected with the help of available literature, discussion with the persons who were associated with training programme and own experience of investigator. These 26 items were considered essential for making the training programme effective. These items were then sent to the selected judges for their valuable suggestions and comments. Out of these, the overlapping items were deleted and new ones were added in the list. Thus, finally, 19 items were retained. These items were arranged in the form of statements

and administered to the sample. The agricultural supervisor (VEWS) as respondents were asked to indicate their degree of agreement or disagreement against each of the statements on a 5-point rating scale ranging from 'strongly disagree' to strongly agree. The 5-points were interpreted from the continuum used as 'strongly disagree', 'disagree', 'undecided', 'agree' and 'strongly agree'. It is expected that favourably worded statements should be scored as high and unfavourably worded statements as low, because it was felt that agreement with an unfavourable statements were psychological, equivalent to disagreement with a favourable statements and similar disagreements with an unfavourable statements were considered equivalents to agreements with favourable statement. Each item, thus received a score of its own and the total scores for the scale were obtained by adding the scores for all the statement.

RESULTS AND DISCUSSION

The first part reports the results pertaining to first objective of the study dealing with the identification and quantification of training needs as perceived by the agriculture supervisors. The second part deals with the opinion of the agriculture supervisors regarding various components of the training programme. The third part highlights the extent of training needs and weightage on theory and practicals given as perceived by the agriculture supervisors. The final part highlights the suggestions for future training needs of agriculture supervisors.

Data in Table 2 reveal that as many as 66 out of 67 respondents (agriculture supervisors) desired to have training in the water saving techniques in agriculture and drip irrigation. The mean score for these items was (2.98) which came as the first, in the need hierarchy. The next in order was the sprinkler irrigation. As many as 65 out of 67 respondents desired to have training in this aspect. The mean score for these items was (2.97), while preparation of farm production plan and budgeting 'obtained third (2.95) place, where as dry land farming (2.94) came at fourth place, while pest and disease control in high yielding varieties of crops (2.91), soil moisture conservation techniques (2.88); extension and communication techniques (2.86), fertilizers and their application in high yielding varieties (2.80) and package of practices of high yielding varieties (2.76) occupied almost the middle positions in the need hierarchy. The last few ranks in the need hierarchy were occupied in decreasing order by the aspects like, evaluation

techniques (2.73), vegetable and fruit preservation for off-season i.e. preserved and dried vegetable, squash, jam jelly, pickles etc. (2.68); crop rotation and inter-cultural operations and soil and seed treatment (2.62), organic farming to enhance the qualitative agriculture production without degradation in soil environment (2.58), production techniques of improved varieties/high yielding varieties (2.53), post harvest technology and save grain i.e. storage, processing, value addition and marketing etc. (2.52), soil sampling technique (2.40), reclamation of problematic soil (2.38), cultivation of aromatic and spices crops (2.37), weed management (2.35), kitchen gardening (2.31), care and maintenance of bovine / ovine (2.11), value addition of agriculture products (2.08), handling and maintenance of farm implements (2.01), and ecological farming (1.64). This shows that agricultural supervisors required training almost in all the subjects.

Thus, the need hierarchy based on mean score rendered the relative urgency with which the agricultural supervisors would like to be trained in the different subject matter areas. This also points out the relative discrepancy in knowledge of the agricultural supervisors about different areas of training. From the above findings (Table 2), it is evident that all the agriculture supervisors needed to have training in the aspects - water saving technique in agriculture and drip irrigation system followed by sprinkler irrigation, preparation of farm production planning and budgeting obtained same place, respectively and soil moisture conservation techniques. Most of the agricultural supervisors also required training in "extension and communication techniques (this includes, selection, use and handling of extension teaching methods and audio-visual aids). Fertilizers and their application in high yielding varieties, package of practices of high yielding varieties, evaluation techniques (this means how to assess the success, failure as well as strong and weak points of a programme implemented in the village) got almost the higher rank which shows that these practices are important in the training needs followed by least important needs in vegetable and fruit preservation for off-season i.e. preserved and dried vegetable, squash, jam, jelly, pickles etc., soil and seed treatments, crop rotation and inter-cultural operation organic farming to enhance the qualitative agriculture production without degradation in soil environment, post harvest technology and save grain i.e., storage, processing value addition marketing etc., soil sampling techniques. Reclamation of problematic soils, cultivation of aromatic and spices crops, weed management, kitchen

gardening, care and maintenance of bovine ovine and value addition of agricultural products. At the bottom of the needs hierarchy, were the training needs like "handling and maintenance of farm implements and ecological farming. The findings with respect to training needs are in line with the findings as reported by Ganeshan and Perumal (1980), Ram (1992) and almost similar results were also reported by Sharma (1995) and Meena (2001).

Table 3 shows that the opinion of the agriculture supervisors about the training programme was considered as strongly agree, agree, undecided, disagree and strongly disagree. Mean scores were ranging from 3.95 to 4.92. While analysing data, nineteen (19) important components pertaining to in-service training were finally subjected to the judges to assess the degree of agreement or disagreement of the agricultural supervisors about in-service training programme. On examination of mean score, it may be seen that the agriculture supervisors had given the extreme choice opinion for subject matter which was in line with the objective of the training programme of agricultural supervisors (4.93). It means there was no problem to agricultural supervisors as subject matter was in line with the objective of training programme, The next items according to the mean score were Language was understandable by trainees (4.85), only relevant topics were discussed with trainees in the training programme (4.65%), weightage on theory and practical was given looking to the type of trainees and timely information was sent to the trainees about training programme (4.61), information about latest developments in agricultural was incorporated in the training (4.58), duration of training programme was quite sufficient looking into the course content (4.56), the most convenient time was selected for training programme and ample physical facilities were made available to the trainees while they were attending the lecture (4.52), a most appropriate number of trainees were invited for training (4.52), course content was mostly in accordance to the need, interest and value of the trainees and guest lecture were invited to the training from time to time (4.50); instructors were very much interested in teaching trainees (4.49) and lecture schedule was kept according to the convenience of the trainees (4.49), appropriate teaching methods were used by the instructors during training programme (4.47); ample facilities of boarding and lodging were provided to the trainees (4.29), the group of trainers was homogenous (4.17) and the trainees were not interested in learning (3.95).

A critical appraisal of Table 2 clearly indicated that most of respondents (agricultural supervisors) agreed with the components like subject matter was in line with the objective of the training programme, language was understandable by the trainees, only relevant topics were discussed with trainees in the training programme, weightage on theory and practical was given looking to the types of trainees and timely information was sent to the trainees about training programmes. Most of the respondents expressed that information about latest development in agricultural was incorporated in the training programme, duration of training programme was quite sufficient looking into the course content. Most of the respondents also expressed that ample opportunities were created by the trainees to clear the doubts of trainees, if any. However, the respondents agreed that the group of trainees was homogenous and most of the respondents were having negative opinion about "lecture schedule was kept according to the convenience of the trainees and most of the respondents expressed that ample facilities of boarding and lodging were provided to the trainees and most of the respondents also agreed that, a most appropriate number of trainees were invited for training. The findings with respect to opinion of agricultural supervisors regarding various components of training programme are in line with the findings reported by Sharma (1999) but the component like ample facilities of boarding and lodging was in contradiction.

A perusal of Table 4 reveals that 'Z' values in case of most of the subjects were significant at 1 per cent level. This means that there should be greater emphasis on theory than on practical; pertaining to various subject matter areas that an agricultural supervisor would like to have in the in-service training programme. However, in case of aspects like agriculture finance, the null hypothesis was found to be true and thus, there should be greater emphasis on theory than on practical. In the subjects where there are positive signs of 'Z' value the agricultural supervisor laid greater emphasis to practical than theory in training programme.

From the above findings, it is evident that most of the agricultural supervisors needed to have training in the aspects of production techniques of hybrid seeds (11.65), handling and maintenance of farm implements" (9.20), soil sampling techniques (7.92), fertilizers and their application in HYV crops in decreasing order of importance. Likewise the training needs of the supervisors further declined in the aspects like i.e. Post

harvest technology and save grain (its, meaning and methods of harvesting, storage, processing etc), preparation of farm production plant (7.12), extension and communication technical (meaning, importance and different kinds of communication) (6.51), evaluation of training techniques (means how to assess successes or failure of a particular programme) (6.47), package of practices of high yielding varieties (6.20), contour farming and salt tolerant crop (5.56), pest and disease management in HYV of crops (5.39), soil and water conservation techniques (5.21), organic farming (5.15); kitchen gardening (5.05), crop rotation and weed control (4.91), care and maintenance of livestock (4.75), biofertilizers and soil fertility (4.55)".

The training needs still declined in the aspects like vegetable and fruit preservation (4.52), propagation of fruits and hormones in plant growth (3.44), plant protection equipments and pheromone trap (3.00), dry land farming (concepts and crop production techniques) (2.05), where agricultural finance (meaning importance and different source) could find place only at bottom in order of importance of training needs of supervisors.

The higher weightage was given to aspects like production techniques of hybrid seeds, handling and maintenance of farm implements, soil sampling techniques, post harvest technology and save grain which fertilizers and their application in HYV crops, means these aspects were considered in order of training need hierarchy more important for in-service training.

Soil sampling techniques obtained third rank in order of training need hierarchy. This indicates that agriculture supervisors are conscious of the great scope of soil sampling technique in Jaipur district. The production techniques of hybrid seeds received first rank which indicates that the agriculture supervisors are aware of the increasing importance of hybrid seed production techniques in Jaipur district of Rajasthan. At the bottom of the need hierarchy were agricultural finance and dry land farming. In agricultural finance emphasis on practical and theory was almost similar, which might be because of the nature and contents of the subject that the agriculture supervisors perceived. These findings are in line with the findings reported by Kumar *et al.* (1994).

The analysis of future training needs on different areas of in-service training as perceived by the respondents in terms of their mean scores presented in table 4 and there were 28 major areas of training listed under future training needs and responses were recorded

against 3-point scale ranging from most needed, needed to not needed. By and large a cursory perusal of overall pooled mean scores revealed that the respondents needed training more in, vegetable production and drip and sprinkler irrigation (2.95), followed by watershed developments technique and, green manuring (2.92), use of internet (2.86), nursery raising (2.85); latest communication techniques in extension (2.82); post harvest technology (PHI) (2.76)' organic farming to enhance the agriculture production without degradation in soil environment (2.71), use and maintenance of different plant protection equipments (2.70), identification of weeds and their control measures (2.65), seed treatment techniques (2.59), dairy management practices (2.58), fruit production (2.53), use of computer in agriculture (2.52), mixed farming (2.46), cultivation of fodder crops (2.44), rearing of goat and sheep (2.43), poultry farming (2.41), growing of ornamental plants (2.40), maintenance of orchard (2.35), fertilizer quality control (2.11), safe and judicious use of pesticides (2.08), agricultural meteorology (1.98), mushroom cultivation (1.64), ecological farming (1.47). This shows that the agriculture supervisors needed training more or less in all the above 1 to 28 items. But most of agriculture supervisors gave more emphasis on vegetable production, drip and sprinkler irrigation, watershed development techniques, green manuring, use of internet and nursery raising. This clarified that they required training in floriculture. This subject till now was neglected in training programmes in Jaipur district of Rajasthan. The agriculture supervisors also gave more or less equal emphasis on the latest communication techniques in extension, post harvest technology, organic farming to enhance the agricultural production without degradation in soil environment, identification of weeds and their control measures and seed treatment techniques. All these problems are directly related to day to day agricultural operations carried out by the farmers therefore, agriculture supervisors should be trained in all the above aspects. The agriculture supervisors gave slightly less emphasis on dairy management practices, fruit production, use of computer in agriculture, mixed farming, rearing of goat and sheep, poultry farming, maintenance of orchard, fertilizer quality control, safe and judicious use of pesticides, agricultural meteorology, mushroom cultivation, ecological farming. From the above discussion, it may be inferred that the agricultural supervisors had more training needs than they perceived so they should be provided training according to their requirements. Similar findings were also reported by

Sharma (1999), Reddy (1989), Kumar and Kanwal (2004) and Bareth and Rathor (1993).

CONCLUSION

It was concluded that the agriculture supervisors needed in-service training in order of priority in the areas like “Drip irrigation systems and water saving techniques in agriculture, sprinkler irrigation, preparation of farm production, planning and budgeting, dry land farming, pest and diseases control in high yielding, soil moisture conservation techniques, extension and communication techniques, fertilizer and their application in high yielding varieties, high yielding varieties, evaluation technique, vegetable and fruit preservation for off-season, soil and seed treatment, organic farming to enhance the qualitative agriculture production without degradation in soil environment. Production techniques of improved varieties / high yielding varieties, soil sampling techniques, reclamation of problematic soils. Cultivation of aromatic and spices crop, weed management, kitchen gardening, care and maintenance bovine, value addition of agriculture products, handling and maintenance of farm implements, ecological farming. Further, based on opinion of agriculture supervisors regarding various components of training programme, it was concluded that the improvement on the aspect like “subject matter was in line with the objective of the training programme”, “language was understandable by the trainees”, “course content was mostly in accordance to the need, interest and value of the trainees”, “timely information was sent to the trainees about training programme and weightage on theory and practical was given looking to the type of trainees”, “information about latest development in agriculture was incorporated in the training, duration of training programme was quite sufficient looking into the course content”, “ample physical facilities were made available to the trainees while they were attending the lecture”, “guest lecture were invited in the training from time to time and course content was mostly in accordance to the need, interest and value of the trainees”, “ample facilities of boarding and lodging were provided in to trainees “The group of trainees was homogenous”, “trainees were not interest in learning, “were realized. They would like to have much greater emphasis on practical than on theory in the training programme. It was concluded that agriculture supervisors needed in-service training in order of priority in the areas of practical and theoretical based on training needs of agriculture supervisors. Priority in the area like “production technique of hybrids seeds”, “handling and

maintenance farm implementance, “soil sampling technique fertilizers and their application in HYV crops”, “post harvest technology and save grain, “preparation of farm production plan, extension and communication technique, package of practices of high yielding varieties and evaluation of training techniques need to be given.

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Effectiveness of Collective Farming Under Kudumbasree programme of Kerala

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ABSTRACT

A study was conducted among groups involved in the collective farming under Kerala State Poverty Eradication Mission (Kudumbasree mission) of Kerala in order to assess the perceived effectiveness of collective farming in terms of resource, technology, extension, marketing and capacity building. Considerable improvement was observed in all the components studied, indicating that group mobilization have potential to overcome the multiple constraints faced by small farmers at individual level. 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

Keywords: Collective farming, Effectiveness, Kudumbasree

INTRODUCTION

Group mobilization and consequent collective action is often pointed out as an important strategy to overcome the various constraints faced by the small and marginal farmers at individual level. The concept of collective action is re-emerging recently to organize small farmers in developing countries in the wake of agricultural market liberalization (Coulter *et al.*, 1999). Collective actions can increase farmers' capacity to access formal credit (Quizon and Rieger, 2003), offer an alternative to state and markets institutions (Pandolfelli *et al.*, 2007), allows smallholder farmers to jointly invest in management practices that provide collective benefits in terms of economic and sustainability gains (Shiferaw *et al.*, 2008), can help the smallholders to overcome the problems of transaction cost arising from their small size of marketable surplus, can improve their access to resources such as inputs, credit, training, transport and information and increase bargaining power, can also reduce individual farmer risk (Agarwal, 2010). Fischer and Quaim (2010) found that marketing through the group yields a higher price than selling individually at the farm gate.

Kerala State Poverty Eradication Mission or Kudumbasree programme is a Self Help Group based women oriented initiative to fight absolute poverty. It was launched in 1998 by the State Government with

the active support of Government of India and NABARD. The lower most tier of Kudumbasree constitutes the SHGs consisting of 10-20 women members selected from the poor families. SHGs under Kudumbasree are known by the name 'Ayalkootam' (Neighborhood Groups). Kudumbasree is one of the largest women's movement in Asia with 3.8 million members in 0.2 million SHGs (Kudumbasree, 2010). Since inception, Kudumbasree has promoted farming and other allied activities for income generation of SHG members. Many special projects on agriculture have also been implemented by the mission in collaboration with local self governing bodies and other governmental agencies. Collective Farming is an initiative introduced by Kudumbasree to encourage cultivation by neighborhood groups. Joint liability groups of women farmers are formed under the collective farming initiative. The concept of the collective farming emerged as a response to the paradoxical situation of heavy dependence of Kerala on neighboring states for food commodities in spite of the fact that large areas of cultivable land was kept idle in the State due to the waning interest in agriculture. On the other hand, thousands of poor families who are ready to undertake agriculture as a livelihood option did not have enough land to venture into agriculture. In this context, Kudumbasree mission encouraged Neighborhood Groups to undertake lease land farming as an income

generating activity. Presently, there are 2,25,200 women cultivators in 46444 groups were cultivating various crops like paddy, banana, tapioca and vegetables in 25062 hectare (Kudumbasree, 2010). Harnessing the potential of SHGs in agriculture has wider implications since collective action is considered as important strategy to overcome the number of problems faced by small and marginal farmers. All the activities like farming, dairy, coconut processing, ethnic delicacies etc are selected based on the prior knowledge and skill of the members in the respective areas. Knowledge of the members in the activities was upgraded through various capacity development programmes of the mission and other agencies.

MATERIALS AND METHODS

The study was conducted in Kozhikode districts of Kerala. The units of analysis of the study were exclusive women group under Kudumbasree programme involved in collective farming activities. From each district fifty groups were selected following a multi stage random sampling procedure and leader of each SHG was included in the sample. The Personal interview with structured questionnaire was used for collection of primary data. An effectiveness index was developed for the study based on five components which were selected based on literature review and expert opinion.

- (i) Resource mobilization: resource mobilization was operationalised as the extent to which various resources like credit, inputs and animals were available to the respondent
- (ii) Extension orientation: Extension orientation was operationalised as the extent to which the respondent was aware of various extension programmes, access to and availability of public and private extension services and participation in extension activities.
- (iii) Marketing effectiveness: Marketing effectiveness refers to respondents' perception about availability of market information, presence of intermediaries, collective marketing facilities, bargaining power of producers, transparency in marketing operation and marketing transaction cost
- (iv) Capacity building: Capacity building was operationalised as the extent to which respondent have knowledge and skill to undertake diversified activities, to diagnose and solve the problems and to learn and use innovations.

In case of the four components mentioned above, respondents were categorized into following categories based on their responses

Response	Score
Nil	0
Low	1
Medium	2
High	3

- (v) Technology adoption: Technology adoption was operationalised as the extent to which the respondent has adopted various dairy technologies. Adoption of dairy technologies by the respondent was measured on a nominal scale based on the responses; as below:

Response	Score
Yes	1
No	0

For each of these components separate index was calculated as follows for both periods:

$$\text{Effectiveness index} = \frac{\text{Actual score obtained for that component}}{\text{Maximum possible score for that component}} \times 100$$

To find out the determinants of collective farming effectiveness discriminant function analysis was used. Discriminant function analysis is a statistical technique to study difference between two or more groups with respect to many variables at the same time (Klecka, 1980). A linear discriminant equation, $D = v_1X_1 + v_2X_2 + v_3X_3 + \dots + v_iX_i + a$, is constructed such that the two groups differ as much as possible on D.

Where D = discriminate function
 v = the discriminant coefficient or weight for that variable
 X = respondent's score for that variable
 a = a constant
 i = the number of predictor variables.

Collective farming groups were classified into two groups of almost equal number based on the value of effectiveness index and coded as 1 and 2. Socio

economic and psychological variables considered for analysis include age, education, annual income, land holding, livestock holding, social status, social participation, economic motivation, support from Kudumbasree, group dynamics, functional linkage, credit availed, self reliance and risk taking ability. Those variables with the largest standardized discriminant coefficients are the ones that contribute most to effectiveness of collective farming.

RESULTS AND DISCUSSION

Perceived effectiveness of collective farming groups was studied at individual level. Five components were identified and improvement in these components was analysed and mean score for all the components was presented in Table 1.

The results of the paired t-test showed that difference in the mean score for all the components of effectiveness index were statistically significant at 1% level of significant. There was considerable difference between the mean score of components in both the periods.

Access to land was one of the major issues faced by women SHGs to take up farming as an income generating activity. Intervention by the Kudumbasree personnel and office bearers of gram panchayats has helped the group members to lease the land for cultivation. Many women SHG members have expressed the difficulty in continuous access to the land on lease. In many cases, land owners were not willing to agree for a lease period more than one year. Nair and Vineeta Menon (2006) in their study on lease land farming in Kerala had pointed out that it is the responsibility of the state to formulate an appropriate policy framework for lease land farming in promoting small-scale lease farming (and not large-scale contract farming). Such a policy framework would ensure not only the fixity of tenure and the lessors' right over land, but also spell

out local level mechanisms to organize contracts between the lessors and lessees, making available the relevant information on the availability of land for lease, its quality, etc, to potential tenants. The panchayats, which have already involved in supporting the self-help groups to take up lease cultivation, could play a leading role in this process; they could expand the scope of lease farming by creating a land bank that would function as an intermediary between those who want to lease out their lands and those who want to lease in. Such land banks could also work out an insurance scheme for leaseholders to get a compensation for crop failure due to natural calamities or fall in incomes due to sharp fall in prices.

Another aspect was access to credit. Under the collective farming initiative of Kudumbasree mission, Primary Agricultural Cooperative Societies (PACS) provide interest free loans for selected crops and play an important role in the farming by these women groups. Nationalised banks and some private banks provide crop loan for the group at 7 percent. Out of this 7 percent, 5 percent is provided as interest subsidy from Kudumbasree and hence the group gets the loan at a low interest rate. Group members in Kozhikode districts have received, on an average, Rs. 1263 as area incentive and Rs.444 as interest subsidy. Access to credit has improved the timely access to inputs also. Reduction of input transaction cost due to economy of scale achieved in purchase and transportation of inputs has also contributed to the effectiveness of collective farming groups in resource mobilization front.

The pooling of human resource has helped them to overcome the problems of labour shortage and better supervision of the enterprise. Indian agriculture is experiencing shortage of labour in rural farms, a phenomenon which was highly unlikely in the Indian context till recently (Alha and Yonzon, 2011). Agarwal (2010) has pointed out that group based agriculture

Table 1: Mean score obtained by SHG members on the components of effectiveness index

Components of SHG effectiveness index	Score		Paired difference	t-value
	Pre-SHG	SHG		
Resource mobilization	57.33	86.22	28. 89	15.6786**
Extension orientation	56.33	86.67	30.33	14.5098**
Marketing effectiveness	48.59	68.15	19.56	12.6192**
Technology adoption	24.4	59.2	34.8	1.82602**
Capacity building	48.59	68.15	19.56	12.6192**

helps facilitate labour sharing and easy substitution for a member who is temporarily unable to work due to illness or other exigencies. Group effectiveness was also visualised in the better management of the enterprise compared to individual farmers.

Awareness about extension programmes and access to extension service have been improved in case of all the groups studied. Activities of Department of Agriculture were integrated with the collective farming initiative of Kerala. Group members were provided with seeds, and financial incentives through decentralised offices of agricultural department, called as 'Krishi Bhavans'. Facilitation by network of SHGs and SHG federations has improved the information dissemination, especially on new programmes and other activities. It was also observed that access to advisory service from public extension system is still constrained by operational limitations of public extension system. Though there was increase in the number of visits by group members to Agricultural Offices, purpose of visit was mainly for accessing inputs and financial assistance rather than for seeking crop production and protection information. Field visits by extension personnel have also not increased to satisfactory level. Dependence on input dealers for plant protection advice is still continuing in the case of many SHGs.

It was observed that group mobilization has not improved the marketing effectiveness to a marketable level in the case of crop production. Under collective farming initiative, Kudumbasree mission has provided financial and technical assistance of crop production, but marketing assistance is restricted to organization of seasonal fairs only. Since the collective marketing facilities not in operation, SHG members were marketing their produces individually. This is an area where SHPIs have to improve their presence.

There was noticeable improvement in the awareness about and adoption of technologies. But level of adoption is still lower compared to improvement in the awareness about technology. Though all the SHG members were aware of the High Yielding Varieties, rate of adoption was found to depend on the provision of seeds/planting material by SHPI or agricultural department. SHG members were provided number of

trainings on different aspects of farming by respective SHPIs as well as various other agencies like Agricultural Technology Management Agency (ATMA). All the SHG members have perceived considerable improvement in their skill and competency to carry out the enterprises they have undertaken. Apart from the trainings they have received field level experiences and the group efficacy has also contributed to development of their capacities. Participation in the activities, from planning to marketing, has given the confidence to continue farming as the means of their livelihood. Even then many of the SHG members have expressed the need for more skill based trainings especially in the areas of value addition, pest and disease diagnosis, diversified farm activities like ornamental fisheries, poultry, use of small scale machineries like weed cutter etc.

Discriminant function analysis was used to find out the determinants of SHG effectiveness. Respondents were classified into two groups (High and Low) based on their perceived effectiveness score. Appropriateness of this classification was verified using classification table results. The classification results revealed that 100% of original grouped cases correctly classified and 88% of cross validated groups¹

The major determinants of effectiveness of collective farming as revealed from results of discriminant function analysis are education, social participation, economic motivation, group dynamics and support from Kudumbasree mission.

It can be inferred that groups with members who were better educated and having more participation in formal organizations were able to mobilize the resources and demand for extension services. They were able to better understand the technologies and practices and adopted it. Economic motivation of the group members has contributed to the effectiveness through their urge to maximize the gains for improvement in their economic condition and standard of living. Group dynamics effectiveness in terms of participation of members, democratic approach and group cohesion is important to harness the potential of group mobilization. The results have shown that groups with higher group dynamic effectiveness were more effective in terms of resources, technology, extension, marketing

¹Cross validation is the process of testing a model on more than one sample to assess the reliability and generalizability of the findings. In cross validation, each case is classified by the functions derived from all cases other than that case. The cross validated set of data is a more honest presentation of the power of the discriminant function than that provided by the original classifications are correctly classified.

Table 2: Classification results of discriminant function analysis

		Effectiveness Index	Predicted group membership		
			High	Low	Total
Original	Count	High	25	0	25
		Low	0	25	25
	%	High	100.0	.0	100.0
		Low	.0	100.0	100.0
Cross-validated ^a	Count	High	22	2	24
		Low	4	22	26
	%	High	91.7	8.3	100.0
		Low	15.4	84.6	100.0

Table 3: Results of discriminant function analysis of factors affecting effectiveness of collective farming

Socio-economic characteristics	Significance	Standardized discriminant function coefficient
Age	0.238	-1.575
Education	0.003	1.406**
Annual Income	0.757	1.213
Land Holding	0.760	1.264
Social Status	0.105	0.760
Social Participation	0.016	0.656**
Information seeking behaviour	0.324	0.507
Economic Motivation	0.000	1.337**
Group dynamics	0.000	0.443**
Support of Kudumbasree	0.000	0.132**
Functional Linkage	0.434	0.786
Risk Taking Ability	0.630	-0.537
Self Reliance	0.500	0.569
Credit availed	0.347	0.454

*Significant at the 0.05 level of the probability.

**Significant at the 0.01 level of the probability.

and capacity building. Efforts of Kudumbasree mission were instrumental in group mobilization as well as forging their linkages with key stake holders. Convergence of various schemes and activities of line department with Kudumbasree mission have significantly related to the support received by the groups.

CONCLUSION

The assessment of effectiveness of collective farming groups in Kozhikode district of Kerala revealed that farming groups could prove considerable effectiveness in terms of resource, technology, extension, marketing and capacity building. Scope for further improvement

still exists. It was also observed that coordination with other agencies and institutions like co-operative banks, line departments as well as convergence with various programmes of central and state governments played an important role in realizing the potential of group mobilization. Role of concerned promoting institution (Kudumbasree mission) was found to be instrumental in forging these linkages. Potential of group mobilization should be harnessed in agriculture and allied activities to address the multiple constraints faced by small, marginal, women and tenant farmers. Collective action has important role in promoting inclusive growth. So, due attention should be given to the factors affecting the synergy of collective action to achieve inclusiveness in agriculture.

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Short Communication

Developmental Changes in Self Concept and Emotional Stability Among Rural Adolescents of Punjab

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ABSTRACT

Developmental changes in self concept and emotional stability in rural adolescents (12-18 years) was studied in the state of Punjab. For the above purpose a sample of 476 adolescents divided over two sexes (n=238), two socio economic strata (n₁ 19) and seven yearly age groups (n=J 7) was drawn. Saraswat's self concept scale (1984) and Sen Gupta and Singh's emotional stability scale (1985) were used to assess self concept and emotional stability respectively. Significant sex and age differences were found in the mean scores of self concept and emotional stability. Adolescence is a time of growing up, of moving from immaturity of childhood into the maturity of adulthood. A period of change during which the individual undergoes not only physical changes but also psychological transformation.

Keywords: Self concept, Emotional Stability, Rural adolescent, Punjab

Self concept is a global evaluation made about one's own personality. It is the person's perception about oneself, how one feels about oneself and how he is influenced by environmental reinforcements and significant others. It is important at this stage to form positive self concept because formation of negative self concept is associated with more frequent negative feelings and increased rates of behavioral and psychological problems for some. Children's evaluations of their own competencies affect their emotional experiences and future behavior in similar situations as well as their long term psychological adjustment. Emotions are very important force in the development of the child. Emotions influence an individual's adjustment with other individual in society and determine his conduct towards them. Thus the present investigation was initiated to study the developmental changes in self concept and emotional stability of rural adolescents.

A sample of 476 adolescents aged 12-18 years was drawn from those villages of Ludhiana, Ropar, Fatehgarh Sahib and Patiala districts of Punjab where senior secondary schools were available. The sample was equally divided over the two sexes (n=238), two socio economic strata (n=1 19) and seven yearly age groups (n=17). Saraswat's self concept scale (1984) and Sen Gupta and Singh's emotional stability (1985) scales

were used respectively to assess self concept and emotional stability of adolescent boys and girls. For statistical analysis, arithmetic mean, standard deviation (SD) and Z test was used to analyze the transitions in self concept and emotional stability.

The following account presents results of the present study with reference to transitions in self concept by developmental stage and sex. It is evident from Table 1 that boys and girls differed significantly from each other at middle (Z=3.87) and late (Z=2.22) adolescence stage. Boys' age/stage differences were found to be statistically significant at 5 percent level between early and middle adolescent stage (Z=1.98) and between middle and late adolescent stage (Z=2.5). These observations showed that in all age groups, girls scored higher than boys. Scores for self concept increased progressively from one stage to the next. This may be because in early adolescence, adolescents look towards more people for information about themselves as they enter a wider range of settings in school and community. When adolescents move into middle and late adolescence, their scores of self definition becomes more selective. The above findings are similar to that made by Barenboim (1977). That self concept increases as one advances in age. Further differences in boys and girls may be due to the fact that girls scored higher on the self esteem dimension which is the evaluation side of self concept.

Personal observations and interviews were conducted on the subjects to get in-depth information about self- concept. Results revealed that adolescents consulted each other to complete their assignments given by the teachers. This consultation was limited to school assignment only but for other social/personal situations they preferred to depend upon themselves. On enquiring about whether they talked or discussed their problems with the opposite sex, the answer was never. Boys reported that if they tried to consult girls especially for class notes etc., they were scolded by teachers and if girls talked with boys and parents came to know about it, they were taken out from the school and were scolded which resulted in lowering their self concept. Even teachers did not encourage interaction between opposite sex. It was observed that even in higher classes, boys and girls were segregated and also the school closing time was different for both sexes. Failure to keep this law/rule usually lowered the self concept of the breaker irrespective of sex.

transitions in emotional stability of developmental stage and sex. It is evident from the table that in the early adolescence both boys and girls differ from each other significantly ($Z= 2.5$) in their mean scores for negative dimensions (crying, fighting, quarrelling etc) of emotional stability. But in the middle and late adolescence, no significant differences were seen for positive (helping someone in distress, lending an ear to someone’s problem) and negative dimensions of emotional stability.

Observations showed that for boys age/stage differences were non-significant for both positive and negative dimensions of emotional stability. But for girls, stage differences were statistically significant between early and middle adolescence both for positive ($Z=3.9$) and negative ($Z=2.01$) dimensions of emotional stability. Thus, in all stages girls’ positive mean scores were more than the boys, and girls’ negative mean scores were less than boys. This means the girls were emotionally stronger than boys and they had the

Table 2 presents the results with reference to

Table 1: Transitions in self concept across different stages of adolescence by sex (expressed as mean scores in self concept assessment)

Adolescence stage (age range in years)	Sample size	Mean score	S.D.	Z-value	Level of significance
Early adolescence (12-13 Years)	Boys-68	178.4#	16.45	0.51	NS
	Girls-68	180	19.88		
Middle adolescence (14-15 Years)	Boys-68	172.8	16.45	3.87*	S
	Girls-68	186.5	24.17		
Late adolescence (16-18 Years)	Boys-68				
	Girls-68				

Table value of ‘Z’ at 5% level = 1.96; *Differences significant at 5% level; #Differences significant between middle and late adolescence at 5% level

Table 2: Transitions in emotional stability across different stages of adolescence by sex (Expressed as man scores for the positive and negative dimensions of emotional stability)

Adolescence stage (age range in years)	Sample size	Mean scores		S.D.		Significance of difference (Boys-Girls)			
		Positive dimensions	Negative dimensions	Positive dimensions	Negative dimensions	Z-value positive dimensions	Level of significance	Z-value negative dimensions	Level of significance
Early adolescence (12-13 Years)	Boys-68	7.28	7.51	3.21	3.21	0.877	NS	2.5*	S
	Girls-68	7.71	6.85	2.57	2.78				
Middle adolescence (14-15 Years)	Boys-68	6.21	8.35	3.60	3.60	0.716	NS	0.716	NS
	Girls-68	6.64	7.92	3.42	3.42				
Late adolescence (16-18 Years)	Boys-102	5.57	9.21	6.42	0.955	NS	0.934	NS	
	Girls-102	6.00#	8.78\$	3.25					

Table value of ‘Z’ at 5% level = 1.96; *Sex Differences significant at 5% level; #Differences significant between middle and late adolescence

potential to face the difficult situation more boldly than boys. Anna Mulrine (2002) summarized in her study that boys were more sensitive and often considered as the weaker sex, a role typically associated with women.

Personal observations and interview revealed that adolescent boys were more aggressive than girls but early adolescent girls reported to be as aggressive as boys. Late adolescent girls when angry tried to sought out the matter with the person with whom they were angry. Early adolescent boys and girls started crying when they were scolded by their elders for doing something wrong or going against the wishes of the parents whereas the late adolescent group when being scolded, shut themselves in the rooms or banged household things to express their outburst of anger. In spite of the above negative emotions, adolescents had some positive emotions like helping someone in distress e.g. grandfather/mother or parents, sick person at home or class fellow getting hurt on playground etc.

These boys and girls often used same facial expressions, adopt the same language, and described

their emotional experiences similarly. For many emotional experiences, researchers did not find differences between females and males and thus both sexes were equally likely to feel loneliness, jealous, anxious in new social situations; anger when they were insulted and grief when any closer relationships ends (Tavris and Wade 1984).

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Short Communication

Sustainable Livelihood Security of Tribal Farmers Through HYV of Paddy in Dumka District of Santhal Pargana, Jharkhand

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ABSTRACT

In Jharkhand, Specially in Santhal Pargana, most of the farmers have small landholders, with undulated topography, sufficient rainfall with natural resource. Most of the cultivated lands suffer from soil erosion which results in poor soil fertility. The physical resources like population, climate, rainfall, soil, agrarian structure mostly influences the farming practices and hence limits the crop productivity particularly in upland. In spite of having high rainfall (1300 - 1400 cm/year), farmers of these areas lack awareness about High Yield Varieties (HYVs). The study revealed that poverty can be reduced in sustainable manner by introduction of HYVs of paddy-a prominent crop of the region. The production was improved up to 50 percent which provided sufficient food to the tribal families in Santhal Pargana for round the year which was instrumental to uplift their socio economic standard. These farmers were motivated towards crop diversification and also involved in other crops like wheat, chickpea and groundnut. The enhancement in crop productivity provided food security and improved socio-economic condition.

Keywords: HYVs of paddy, Small Farmers, Santhal Pargana

The productivity of paddy in Jharkhand state in 2010 was 16.5q/ha as against the National average during same year (24.2 q/ha). The overall picture revealed that the agriculture in Jharkhand is relatively underdeveloped as compared to other Indian states. Addition of HYV with improved and advance agricultural technology by the majority of farmers is important in developing countries like India where the economy is mainly based on agriculture. The Birsa Agriculture University and ICAR collaboration programme is running in the district Dumka, Santhal Pargana of Jharkhand for livelihood security in tribal farmers. The agriculture is the back bone of tribal economy and it is envisaged in tribal development programmes. Food and nutritional security of the state population is a matter of concern. At the same time, poverty in Jharkhand is very high as compared to national scenario. Rice is the most important *keharif* crop, have immense possibilities of development in agricultural sectors. Out of 10.13 millions working population, 76.86 percent are engaged in agriculture in Santhal Pargana. Vast working force and natural resources are able to produce food grain to meet only 50% of the requirement, Santhal Pargana of Jharkhand

have typical rain fed Agriculture (89% area is rain fed) with vast stretch of barren cultivable water land (46%), inhabited mostly by tribal population. The existing agriculture scenario reveals that rice is the single major crop covering about 0.492 million hectares of upland and 1.485 million hectares of low land area in the State. Average yield of paddy in Jharkhand is below the national average in spite of having good rainfall, long sunshine hours and favorable temperature regimes. A study was conducted during 2008–09 and 2009–10 to assess the impact of introduction of high yield variety and hybrid of paddy as well as introduction of other crops like groundnut, wheat and chickpea with balanced fertilization and recommended organic practices.

The study was carried out in Dumka and Jama block of Dumka District of Jharkhand during the 2008-09 and 2009-10. These blocks were denoted as tribal blocks by the State Government. Five village of each block were selected for the study. These villages had more than 90% of the tribal population, and were growing paddy as the main crop. Out of total adopted farmers, 400 respondents were randomly selected for the study from ten villages, viz. Karmatand, Andipur,

Kodokhiche-6, Kodokhiche-7 and Guhijori in Dumka block, and Gajhand, Palasi, Bhoura, Ragad and Karela of Jama block in District of Dumka. Participatory Rural Appraisal was conducted with the selected farmers to measure the major dimensions like: Production by traditional / local variety, Production enhanced by introduce HYV, Popularity of HYV, Duration of availability of food, Use of fertilizers and Area enhancement after introduction of HYVs.

Table 1 shows that the yield of HYV was 48.38 q/ha which was 172.56% more as compared to traditional variety like MTU-7029 (19.67 q/ha and local/Destri. 15.83 q/ha). Average yield of traditionally growing varieties viz. MTU-7029 and local was only 17.759 q/ha with increase in production 172.56%. The differences with local variety in yield was 205.62%

followed by MTU-7029 (145.95%). These findings are in conformity with earlier work of Ray (1976), Bhat (1980), Monjunath (1980), Singh and Prasad (1986) and Verma (2000).

When farmers adopted the HYVs of Paddy along with the recommended practices, it had effect on traditional crops. Table 2 shows that the traditional variety yield also increased. For example the variety MTU-7029 yielded earlier 19.76 q/ha only has been increased up to 28.53 q/ha (45%) and local variety yield was also increased, which was earlier 15.83 q/ha, has increased up to 19.62 q/ha (23.9%). It was observed that when farmer adopted improved HYVs, they also applied it to traditional cultivation practices which led to increase in production and created yield certainty. Khan (1996) and Prakeghet (2004) also reported similar

Table 1: Increase in introduction by introduction of high yield variety and comparison between traditional variety and HYV (Lalat)

Variety	Av. yield	Increase production of traditional variety after adopting recommendation	Increase production (%)	Increase % production comparison to lalat variety	Land Type	Cultivated area (%)
MTU-7029	19.67	28.53	45	145.955	Lowland	15
Local/Deshi	15.83	19.62	23.9	205.62%	Midland	23
MTU-7029	17.75	29.57	66.59	172.56%	Midland +	19
Lalat	Initially not adopted	48.38			Lowland	45

Table 2: Impact of HYV cultivation on traditional variety.

Variety	Av. yield in q/ha before HYV & recommended cultivation practices	Av. yield in q/ha after HYV recommended cultivation practices	Increase yield in q/ha	Increase yield in (%)	Land type
MTU-7029	19.67	28.53	8.86	45	Low land
Local	15.83	19.62	3.79	23.9	Mid land
Average	17.75	29.57	11.82	34.5	

Table 3: Comparison of local and traditional variety with adoption of recommended agronomical practices

Variety	Av. yield of traditional variety in q/ha	Production increase of HYV compare of traditional yield in q/ha	Production increase of HYV compare to traditional variety (%)
Av. yield of MTU – 7029 & local/trad. variety	29.57	18.81	63.76
HYV (local)	48.38	-	-

results in their studies. As in Table 3 the result shows that farmeris convinced with HYV and yield increased up to 63.76% and yield is increased traditional cultivated variety is 34.5%.

CONCLUSION

The major contribution of HYV was in increasing the production up to 63.76% as compared to traditional cultivated variety. Because of HYV, production increased up to 48.38q/ha and traditional variety production was increased up to 29.57q/ha which was earlier 17.75q/ha. Only because of the seed replacement rate to the extent of 35%, the sustainability of variety was ensured. In Agriculture HYV variety has contributed maximum for enhanced production particularly in the study area of Santhal Pargana. Dumka District has positive impact on other cultivars, where production was also increased. It was clear from the results that if the production will increase, farmers will get more income. in Santhal Pargana of tribal farmers. More agriculture is only source of income and livelihood security.

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Short Communication

Identification and Prioritization of Competencies of Kinnow Growers in District Muktsar, Punjab

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ABSTRACT

A study was conducted to identify and prioritize the competencies of Kinnow orchards owners in Muktsar district of Punjab state. A stratified random sample of Kinnow growers was selected. The data were collected through personal interviews. It was found that the most crucial competencies where farmers need training are time and method of irrigation, drip irrigation and its operation, management of phytophthora, identification of insect pest and disease symptoms and their control measures, control of fruit drop, management of alternate bearing and fruit thinning. The competencies of kinnow growers may be increased through implementation of skill improvement programmes like conducting of kinnow demonstrations, kinnow orchard visits, organization of farmers tours and farmers – scientists interaction groups, training about post harvest technology and value addition to kinnow.

Keywords: Kinnow growers, Competencies and training need

India is the second largest producer of fruits after China, with a production of 44.04 million tonnes of fruits from an area of 3.72 million hectares. Citrus fruits rank 3rd in area and production accounting for about 12 and 10.4 per cent of the total area and production, respectively. Lime, lemons, sweet oranges and mandarin cover bulk of the area under these fruits and are grown mainly in Maharashtra, Andhra Pradesh, Karnataka, North-Eastern States, Punjab, Orissa and Madhya Pradesh. Kinnow fruits are the first fruit crop in international trade in terms of value. Interestingly while India is the sixth largest producer of citrus fruits accounting for 5 per cent of global production but it has no place in world citrus trade. This is due to sticking to its old varieties with little introduction of new varieties where, for instance, mandarins are now seedless while India yet continues to stick to mandarins which have hardly any market with global consumers. This is due to lack of quality control, which plays an important role in exports, little encouragement of international standards and poor marketing practices.

The area and production of kinnow crop has increased from 22887 ha and 343305 m tones to 27606 ha and 414090 m tonnes during the period of 2005-06 to 2006-07, respectively, in Punjab, Muktsar stands 3rd in Punjab as far as kinnow production is concerned. The

total area under kinnow cultivation in Muktsar district is 5340.4 ha. Enumerating various development works initiated by the State Government and extension services provided by Punjab Agricultural University, Ludhiana and Krishi Vigyan Kendras of the state have been helpful in disseminating information related to kinnow cultivation. The improved technologies for maximizing kinnow production are being made available to farmers through these centres. Even then, the yield of kinnow has not increased to a considerable extent. One of the important reasons for low yield of kinnow may be the partial adoption/non-adoption/different adoption behaviour in respect of the recommended practices because of the communication gap. This deficiency on the part of the Kinnow growers can be overcome by comprehensive training and extension programme for farmers concerning modern kinnow production techniques. Kadian (1999) stated that marginal farmers were poor accepters of innovations. One of the reasons of poor adoption/acceptance was the low level of knowledge and skill of farmers in growing and managing fruit plants/gardens. Considering this aspect, a study on identification and prioritization of competencies possessed by kinnow growers in district Muktsar was carried out.

This study implied descriptive research design. The

Table 1: Knowledge, skill and attitude levels of recommended practice as reported by kinnow growers (N=221)

Practices	Knowledge		Skill		Attitude		Combined Average	Rank
	X	SD	X	SD	X	SD		
Time and method of irrigation	2.17	0.54	2.13	0.53	1.98	0.62	2.09	1
Drip irrigation and its operational know how	2.09	0.62	2.10	0.56	2.02	0.56	2.07	2
Management of Phytophthora foot rot	2.11	0.64	2.06	0.69	2.01	0.65	2.06	3
Insect/pests management	2.05	0.75	2.01	0.83	2.03	0.75	2.03	4
Fruit drop and its management	2.03	0.72	2.04	0.68	2.01	0.86	2.02	5
Management of alternate bearing	2.02	0.76	2.01	0.79	1.99	0.99	2.01	6
Fruit thinning	2.02	0.57	2.07	0.52	1.96	0.93	2.01	7
Soil and water testing	2.01	0.69	2.06	0.79	1.92	0.73	1.99	8
Method of harvesting	1.99	0.49	2.00	0.73	1.88	1.01	1.95	9
Post harvest technology	1.98	0.81	2.05	0.78	1.78	0.81	1.93	10
Marketing	1.98	0.93	1.78	1.08	2.02	0.98	1.92	11
Time and method of fertilizer application	1.94	0.80	1.71	0.76	2.01	0.80	1.88	12
Intercropping	1.89	0.80	1.73	0.78	1.99	0.80	1.87	13
Method of lay-out	1.84	0.85	1.71	0.79	1.87	0.77	1.80	14
Weed control	1.69	0.69	1.68	0.84	1.78	0.88	1.71	15

Scale: 1 = very low, 2 = low, 3 = medium, 4 = high, 5 = very high; X= mean, SD = standard deviation

population of this study consisted of kinnow growers of Muktsar district of Punjab. Muktsar district has four blocks viz. Lambi, Muktsar, Malout and Gidderbaha. There are 2199 kinnow growers. A stratified random sampling technique was used for the selection of respondents. The sample for this study consisted of 221 kinnow growers calculated by using "Table for determining sample size from a given population" developed by Fitzgibbon and Morris (1987). Stratified random sampling technique was used for the selection of respondents due to four blocks of Muktsar district had different number of kinnow growers so that each block represents the proportionate number of respondents. The data were collected through interview schedule. The data were analyzed using SPSS software.

The data were collected from the kinnow growers regarding their technical competencies for the assessment of their needs concerning the knowledge skill and attitude using five point likert scales. Perceptions of the farmers regarding knowledge, skill and attitude level concerning 15 recommended practices were obtained and ranked according to their mean values considering that the lowest value as 1 and the highest value as 15. The results are tabulated in table 1. The results indicated that the competency in which the kinnow growers need maximum training were: (1) Time and method of irrigation, (2) Drip irrigation and its operational know how, (3) Management of phytophthora foot rot, (4) Insect/pests management, (5) Fruit drop and its

management, (6) Management of alternate bearing and (7) Fruit thinning. The results of this study are similar to those of Ahmad (2008). The competency statements that need less attention ranked from 8 to 15 had mean score comparatively high. Soil and water testing, Method of harvest, Post harvest practices to extend shelf life, Marketing, Time and method of fertilizer application, intercropping, method of lay-out and weed control are the areas, wherein, the training needs are comparatively lesser. These results resembled with those of Martin and Sajilan (1989).

CONCLUSION

After the analysis and interpretation of the data, it was found that the most crucial competencies where farmers needed immediate training are time and method of irrigation, drip irrigation and its operation, management of Phytophthora, identification of insect pest and disease symptoms and their control measures, control of fruit drop, management of alternate bearing and fruit thinning. These findings will be helpful for extension personnel and KVK staff in planning their training programmes for Kinnow growers in the studied area.

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Short Communication

Impact of Front Line Demonstration of Improved Okra Cultivation Technology

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ABSTRACT

Front Line Demonstrations (FLD's) were conducted on improved cultivation practices of okra crop in scientific manner at farmers' at fields during 2010-11 and 2011-12. The farmers were selected in different adopted villages of RBS College, KVK, Bichpuri, Agra. The productivity of Okra in Agra region is persistently low due to technology gap. Okra yield can be increased by adoption of improved agro technologies. The demonstrations resulted in increased adoption of the improved okra cultivation technology in the region. The yield of okra increased (24%) and the income (31.9 %) of the farmers increased under front line demonstration compare to local practices over the two years. The improved technology of okra cultivation at farmers' fields resulted in increase of farmer's income and total crop productivity and also knowledge of the farmers. Thus the farmers can be benefitted by conducting more Front Line Demonstration on improved cultivation of okra.

Keywords: Front line demonstrations, Okra, Arka anamika, Income

Front line demonstration is a new concept a field demonstration evolved by the Indian council of Agriculture research (I.C.A.R.). Front line demonstration is one of the most powerful tools of extension. The field demonstration conducted under the supervision of scientists of the Krishi Vigyan Kendra, Bichpuri, Agra. Okra is cultivated throughout Indian for its immature fruit and seed yield. Okra is the world first important staple vegetable crop. It is characterized as a crop of high yield potential and high nutritive value. The global production of Okra is about 7896.26 thousand tonnes. The area, production and productivity of okra in India is 0.498 Mha, 5.8 MT and 11.6 tonnes/ha respectively during 2010-11 (Anonymous 2012). Whereas area, production and productivity of okra in Uttar Pradesh is 11090 ha, 128830 tonnes and 11.394 tonnes/ha respectively during 2010-11 (State Horticulture Mission, UP). The main objective of FLD is to demonstrate newly released crop production and protection technologies and its management practices in farmer's field under different agro climatic region farming system. The important of front line demonstration in transfer of technologies, KVK, R.B.S. College, Bichpuri Agra have regularly been conducted FLDs on since 2003 at farmers field in different villages of Agra district conducted FLD on improved

agriculture technologies of okra crop and for present study, FLD data for the year 2010-11 and 2011-12 was used to evaluate the impact on okra cultivation in selected villages. The results of FLD's clearly revealed that more number of farmers could be benefitted in terms of enhancement of okra productivity and net returns through conduct of need based FLD of improved cultivation practices.

The front line demonstrations were conducted by Krishi Vigyan Kendra R.B.S. College, Bichpuri Agra at adopted village of KVK as per guide line of front line demonstration, set up by Zonal Coordinator of zone IV. Accordingly the FLD under okra crop were laid out at two adopted village of Bavanpura and Nauharika in saiya block of Agra district. The knowledge level of the farmer in these two villages was also estimated by taking random sample of 10 farmers from each village. There by sample included 20 Number of farmers in the study the farmers were asked question and about the improved agro techniques including the high yielding varieties of okra. Two improved varieties Kasha Pragati and Arka Anamika were used in FLD. Recommended doses of fertilizers, 120 kg N, 80 kg P, 60 kg K and 30 kg zinc sulphate/ha was applied as per standard scientific practices for their efficient use.

Farmers were provided with all advanced technical knowledge how about sustainable cultivation of okra under strict guidance of KVK scientist by making regular visit to the demonstration field and by organization of the farmers’ field day and group meeting at the demonstration site. These approaches helped to provide the opportunities for other farmers to witness the benefits demonstrated technologies. The yield and economics data were collected from control (local check) and demonstration plot. The cost of cultivation, net return and benefit cost ratio (BCR) were computed. The BCR formula was calculated as given below

$$BCR = \frac{\text{Gross return}}{\text{Gross cost}}$$

The critical input were deals supplied to the farmers by the KVK data were collected from the field of FLDs farmers and analyzed to compare the yield of farmers yield and FLD field.

Increased yield was calculated by subtracting the earlier yield per acre of the crop before intervention of FLD from present yield after intervention of FLD following formula was used % increase in yield.

$$\text{Increase yield of farmers} = \frac{\text{Increase in yield/acre}}{\text{Earlier yield/acre}} \times 100$$

Increase in income was calculated before intervention of FLD from present profit after intervention of FLD. The following formula was used V increase in income.

$$\text{Increase income of farmers} = \frac{\text{Increase in income/ha}}{\text{Earlier yield/ha}} \times 100$$

FLD on improved agriculture technologies of nutrient management and improved varieties of okra were carried out in scientific manner at farmers field during the 2010 and 2011 and 2011-12.

The knowledge level of the farmers in these two villages was also estimated by taking random sample of 50 farmers from each village. Thereby sample included 100 numbers of farmers in the study. The farmers were asked to reply questions about the improved agro techniques including the high yielding varieties of okra. The scores so obtained under various questions were summed up. On the basis of the total score obtained, respondents were categorized into three classes i.e. low, medium and high level of knowledge. To know the

need of the technological intervention the knowledge level of the farmers in two village were estimated from 100 farmers overall maximum number of farmers fall in the category of medium knowledge level while very few were with high knowledge level (Table 1). Thus need was felt to introduce latest varieties and management in FLD programme in the two villages. FLD is good extension tool to demonstration impact of new agro techniques the farmers.

Table 1: Overall knowledge level of farmers in respect of improved package of practices of okra cultivation (N=100)

Category of knowledge level	Score range	No. of farmers	Percentage of respondents
Low	28-45	20	20
Medium	46-62	50	50
High	63-79	30	30

The progress of FLD on Okra during spring summer season 2010-11 and 2011-12 on improved varieties of okra Kashi pragati (VRO6) and Arka Anamika were found better in term of okra production against local check at Bharanpura and Nauharika villages . The yield enhancement of okra was 23 and 25% in both the years. Sagar *et al.* (2004), Kumawat (2008), Singh and Shrama (2005) has also reported the positive impact in terms of yield enhancement due to demonstration (FLD) of improved production technologies on different crops.

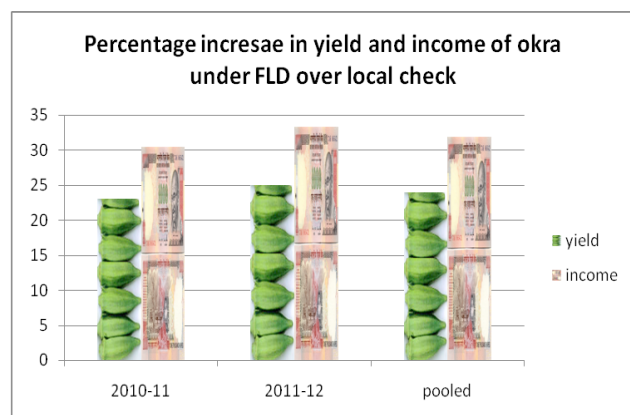
The economic indicator such as cost of cultivation, gross return and benefit cost ratio of FLD on Okra crop were estimated. The data clearly revealed that the net returns from FLD were substantially higher than local check. During year 2010-11 and 2011-12, net returns of 30.4 and 33.3 percentage were recorded (Table 2). The net return from Okra FLD was Rs. 90000 per hectare in comparison to local check (Rs. 69000/ha). On an average Rs. 45000.0 per hectare as additional income is attributed to the technological intervention provided in demonstration over the period of two year (Table 3 and Fig. 1). Economics analysis of the field performance revealed the BCR of demonstration plot were observed significantly higher than control plot /local check. The BCR of okra crop demonstration and local check was 4:1 and 3:1 respectively similar finding were reported by Tiwari and Saxena, 2001.

Table 2: Yield of green pod of okra under frontline demonstration at Bharanpura and Nauharika villages

Crop	Name of technology	No. of farmers	Area (ha)	Yield (q/ha) demonstration	Local check	Increase
Okra (2010)	Arka Anamika	8	2	120	97	23%
Okra 2011	Kashi pragati (V.R.0-6)	6	1	125	100	25%

Table 3: Economics of okra under frontline demonstration at Bharanpura and Nauharika villages

Economics of demonstration					Economics of local check			
2010	Gross cost	Gross return	Net return	BCN	Gross cost	Gross return	Net return	BCN
	30000	120000	90000	4:1	28000	97000	69000	3:1
2011	Gross cost	Gross return	Net return	BCN	Gross cost	Gross return	Net return	BCN
	29000	125000	96000	4.3L1	28000	100000	72000	3.57

**Fig. 1: Percentage increase in yield and income of okra**

CONCLUSION

Majority (70%) of the farmers had low to medium knowledge of improved cultivation practices of okra in Agra region. The farmers need to be sensitized about improved package of practices include high yielding varieties, nutrient management and plant protection of okra and this will help in their large scale adoption. The maximum increase in production were recorded from variety Arka Anamika and Kashi Pragati of 120 q/ha 130 q/ha respectively and were found better in term of okra yields against local check. The average value of

technology indices were estimates 24 % under improved varieties of okra in both the year.

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