Assessment of Entrepreneurial Profile of Rural Women

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Abstract

The country, which is rich in entrepreneurship, can attain economic augmentation too. The entrepreneurs organize the economic ventures for producing goods and services at lower cost with objects of maximization of new employment and setting up new business. Entrepreneurship shows the path of independence to women who are very often living in situations of extreme poverty and in turn satisfies the need aspirations for better living standards.

Economic independence of women gains them a say in family matters and their social status is enhanced. Promotion of women entrepreneurship is a dependable path to economic stability of women and her family. It leads to more spending on education and health, increased decision making power and reduced gender discrimination. Besides there are certain other reasons for spread of women entrepreneurship viz. its close link to social, cultural, religious and psychological variables, the flexible nature of work that combines gainful employment with domestic responsibilities, economic demands especially in rural women, and above all the modernization that snatches bread and butter of an increasing number and proportion of women. There is a need to know entrepreneurs thrive and why? Enhancement in number of women entrepreneurs requires a full analysis of entrepreneurial profile, entrepreneurial environment, interaction in between and taking some action to bring improvements in both. The present study was aimed at assessing entreprepreneurial profile of women in rural Rajasthan.

METHODOLOGY

The study was conducted in Udaipur district. Exploratory cum descriptive research design was used to analyze the entrepreneurial profile a total sample of 200 women was selected for studying the entrepreneurial profile.

It was done with the help of a self- developed scale– "Entrepreneurial Profile Assessment Scale (EPAS)", developed on the lines of Likert summated rating scale. The scale covered two major dimensions of women profile- (i) personal dimension, (ii) Entrepreneurial dimension. These were further divided into sub- dimensions like personal dimension had physical, mental and emotional sub – dimensions whereas the entrepreneurial profile had 6 sub-dimensions viz. managerial, social, technical, financial, legal and trade. Every sub-dimension had four items each. Therefore total EPAS had of 9 sub-dimensions consisting of a total of 36 items. In this way the personal dimension had 12 items and the entrepreneurial dimension had 24 items.

Range of score for any individual sub-dimension (0-20) was broken into different levels as under:

	Range	Scale
1.	0-3.33	very poor
2.	3.34-6.66	poor
3.	6.67-10.0	average
4.	10.1-13.33	good
5.	13.34-16.67	very good
6.	16.67-20.00	excellent

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RESULTS AND DISCUSSIONS

Personal dimension

This dimension of personal characteristics of women has been analyzed in context to the entrepreneurship in the women and it included three aspects viz. physical, mental and emotional sub-dimensions.

(a) The physical aspect

A woman with good health and high energy levels can put in more input into her enterprise and may also be a role model for others in the village and community. Physical aspect had the statements related to physical health of women and included physical efficiency, energy level, eye – sight and muskulo- skeletal problems. Table 1 gives information of individual and total personal scores attained by respondents of both categories i.e. EW and NEW. The study found that women entrepreneurs were generally having good to excellent health and physical efficiency.

Further, the average scores of physical sub-dimension show that EW had mean score value as 14.85 (falling at "very-good" level) and NEW had mean score value as 8.68 (falling at "average" level). Hence, EW had better physical health than EW.

(b) The mental aspect

The mental qualities indicate the ability to discover an investment opportunity and to organize an enterprise (Desai, 2003). This quality is most important to identify and if required to be developed further as it is helpful in the progress of the enterprise. Various items taken in this sub – dimension were innovativeness, commitment, adaptability and internal locus of control.

Almost 84% of entrepreneurial women possessed good to excellent scores on mental aspects like innovativeness, logical behavior and committed.

Almost 84% of entreprenemial women possessed good to excellent scores on mental aspects like innovativeness, logical behaviour and committed.

In contrast, NEW category is concerned, maximum i.e. 79 percent were falling at 'average' level of mental qualities, which indicates that they might be innovative, could possibly adapt if any situation comes, sometimes had commitment for their work whereas at other times they might not remain committed, could not control them selves a number of times.

Further, when the averages of scores of mental sub-dimension were calculated, these came to be 15.08 for EW and 7.86 for NEW, which indicates that EW

Table 1: Categorization of entrepreneurial and non – entrepreneurial women at different levels of possession of traits in sub- dimensions and total personal dimensions

Individual Personal Dimension	Scale Range (0-20)	Excellent 16.67-20.00	Very good 13.34-16.66	Good 10.1-13.33	Average 6.67-10.0	Poor 3.34-6.66	Very poor 0.00-0.33	Averages
Physical dimension	EW	21%	47%	30%	2%	-	-	14.85
	NEW	-	-	10%	83%	7%	-	8.68
Mental dimension	EW	19%	65%	16%	-	-	-	15.08
	NEW	-	-	4%	79%	17%	-	7.86
Emotional dimension	EW	19%	68%	13%	-	-	-	15.32
	NEW	-	-	1%	68%	30%	1	7.20

had 'very-good' mental quality and the NEW had 'average' level of mental quality. Therefore, EW had better mental qualities than NEW.

(c) The Emotional aspect:

The emotions of the individuals are of great importance and are closely related to their perception that helps in selecting, organizing, storing and interpreting the information (Gibson et al. 1997). Emotional qualities taken to study in this research were achievement – motivation, self- confidence, positive attitude and self- control.

Table 1 gives information about emotional qualities of EW, nineteen percent had 'excellent' level of emotional qualities which indicates that they always got inspired by people, always motivated and a small motivator could motivate them, always had high control over their emotions, and remain composed i.e. success and failures did not shake them, had high level of self- confidence, and always had positive attitude towards work.

Highest number of EW i.e. 68 percent had 'very – good' level of emotional qualities, it meant they were also motivated by achievements of others, had high/ strong control over emotions, possessed very good level of self- confidence, and had very good positive attitude about their work.

Rest of the EW, i.e. thirteen percent had 'good' level of emotional qualities, which shows that if not always they were often inspired by others achievements had good emotional control, good level of self-confidence and positive attitude towards work.

Among NEW, only one women was ranked at 'good' level and maximum 68 percent , were falling at 'average' level of emotional qualities which means they were somewhat motivated by other's achievements, could not have emotional control sometimes, were not much confident and at times had negative attitude towards work also. A one third sample i.e. 30 percent of NEW had 'poor' level of emotional qualities which indicates that they had very low achievement- motivation, little control over their emotions, lacked in self- confidence, did not have positive attitude towards work. One woman was even ranked at 'very -poor' level.

So, it is clearly indicated that EW had better emotional qualities as compared to NEW. EW were emotionally more strong that gave them courage and strength to face problems, take risks and move forward, had positive thinking in adverse conditions. The achievement – motivation and positive attitude in these women indicates progress and wider social acceptability.

On the other hand, NEW with lower scores reflected their emotional weakness i.e. lower capacity to bear risk and handle problems which is a very demotivating stage for entrepreneurship.

II. Entrepreneurial dimension

It included 6 sub- dimensions viz., managerial, social, technical, financial, legal and trade. Similar to personal dimension each sub – dimension contained four items thus it had a total of 24 items. Respondents were asked to respond on a 0-5 continuum. Thus a respondent could receive scores ranging between 0-120. The result of the entrepreneurial dimension of entrepreneurial profile is being discussed in this section.

(i) Managerial abilities sub- dimension

It involves decision making which is necessary at all times and at conditions of uncertainty and risks. It can be hypothesized that women with better managerial skill will prove better leaders. Table 2 gives the categorization of subjects according to the averages of scores and totals of managerial sub-dimension as perceived by women in themselves.

In case of Entrepreneurial women (EW), only three percent had 'excellent' level of managerial qualities, it can be inferred that only these EW reported the ability of solving their work problems very effectively and efficiently and this they could do without anybody's help, they presumed that they had highest level of risk – taking ability and possessed fullest ability to marshal resources. These three women also expressed that they had good knowledge about current happenings in their entrepreneurial

environment. Only two percent EW had said that they had 'very-good' level of managerial qualities which indicates that they were able to solve their work problems in a very good and well – planned way if any such circumstance occurs, they felt that they had adequate risk – taking ability and could marshal resources efficiently. They also reported to possess up to date knowledge about the happenings around their entrepreneurial environment. Ten percent were of the view that they had 'good' level of managerial qualities which implies that they could solve their work problems in a satisfactory way, could take limited risks, could marshal resources efficiently and had good knowledge about their entrepreneurial environment. Large percentage i.e, 62 had 'average level of managerial qualities which indicates that not always but sometimes they could solve problems, could take risks to some extent, sometimes were not able to marshal resources and had very little knowledge about entrepreneurial environment. And eighteen percent of EW felt that they had 'poor' level of managerial qualities which means they were poor at solving problems, taking risks, marshaling resources and also poor in knowledge about environment. Rest five percent were at 'very-poor' level of managerial qualities which again indicates that they themselves considered that they were very-poor in solving problems, taking risks, collecting resources and had negligible knowledge about their environment.

In case of NEW, ten percent of them were at 'average' level of managerial qualities, which means they felt that sometimes they could solve work problems, could take risks, marshal resources and had very little knowledge about entrepreneurial environment. A little more than one third i.e. 37 percent of sample had 'poor' level of managerial qualities which indicates that they considered themselves 'poor' at solving problems, taking risks, marshaling resources and also poor in knowledge about their entrepreneurial environment. And majority of respondents 53 percent had 'very-good' level of managerial qualities that indicates that they ranked

Table 2: Categorization of entrepreneurial and non – entrepreneurial women at different levels of possession of traits in sub- dimensions and total entrepreneurial dimensions:

Individual Entrepreneurial dimension	Scale Range (0-20)	Excellent 16.67-20.0	Very-good 13.34-16.66	Good 10.01-13.33	Average 6.67-10.00	Poor 3.34-6.66	Very-poor 0.00-3.33	Averages
Managerial	EW	3%	2%	10%	62%	18%	5%	8.45
	NEW	-	-	-	10%	37%	53%	4.03
Social	EW	-	7%	20%	41%	30%	2%	8.91
	NEW	-	-	15%	10%	73%	2%	6.49
Technical	EW	-	-	2%	32%	64%	2%	6.60
	NEW				7%	30%	63%	3.57
Financial	EW			3%	30%	56%	11%	6.20
	NEW					41%	59%	3.40
Legal	EW				4%	57%	39%	4.16
	NEW					24%	76%	2.88
Trade	EW			5%	10%	62%	23%	4.96
	NEW					50%	50%	3.60

themselves as very poor in solving work problems, taking risks, collecting resources and had negligible knowledge about their entrepreneurial environment.

(ii) Social sub- dimension: The various social traits that were identified to be studied in entrepreneur to make it a success are ability to communicate, desire for status, social responsibility and accommodation among group members.

From table 2, it can be seen that seven percent of EW were at 'very-good' level of social qualities, which can be understood as their presumption that they had very good communication ability, had strong desire to improve their status, higher ability to accommodate with group members and had high sense of social responsibility. A twenty percent of EW were falling at 'good' level of social sub-dimension which reflects that they believed that they had good communication skills, a higher desire for status, were able to nicely accommodate with group members and had good sense of social responsibility. As high as 41 percent had 'average' level of social qualities, which indicates respondent's belief that they sometimes could communicate especially if they were compelled by someone, improving the status had a low priority, could sometime accommodate with group and understand their responsibilities towards society. Thirty percent leveled themselves at 'poor' level of social qualities, which implies their poor communications skills, lack of desire to improve their status. They also lacked accommodation with people or group and were socially irresponsible. Two percent of EW had even reported to have 'very poor' social track, which indicates their very poor communication skills, lack of drive for improvement in their status and also they had very poor accommodation with people and showed nil social responsibility.

Only fifteen percent of NEW had perceived their social qualities at 'good' level, which reflects that they perceived that they had good communication skills, higher desire for status, were able to nicely accommodate with group members and had good sense of social responsibility. Ten percent were at 'average' level of social qualities, which implies that they sometimes could communicate if were compelled by somebody else, status improvement had low priority, could sometime accommodate with group and understood their responsibilities towards society. Majority of NEW (73 percent) perceived themselves at 'poor' level of social qualities which implies their poor communication skills, were not conscious to improve their status; they also lacked in accommodation with group or people and were socially irresponsible. And only two percent of NEW were ranging at 'very poor' level of social qualities, which shows their highly poor or negligible communication skills, they did not worry about their status enhancement ,they were very poor at accommodating with group members and showed nil social responsibility. So, it is clear that NEW was lacking in social qualities like communicating skills, accommodating with people, not socially responsible and did not want to increase their status. This may badly affect the entrepreneurial environment and may also restrict NEW entry in entrepreneurial venture. Further, it is clear from the averages given in fig. 4.2 that EW were more social than NEW as EW had 'average' level of social scores (8.91) and NEW were at 'poor' level with average value of 6.49. Social growth is important for sustainable development of any enterprise because if women are more social, they will be able to bring more finance for establishing any small unit. Better communication skills, good ability to accommodate with people or group, more responsibility towards society will help her in developing stable and wider marketing network, which further will increase her profit. Therefore, there is also a scope of training EW to make them aware about their social qualities.

(iii) Technical sub–dimension: Technical knowledge in entrepreneurial profile is important aspect which requires a thorough assessment of the project planning and includes estimation of actual production process, goods and services needed for the projects, raw materials availability, land, machinery etc. Generally the success of the enterprise depends upon the technical aspects. Therefore, it is

worthwhile to study technical qualities of women entrepreneurs and non – entrepreneurs as technical feasibility is important to run any enterprise successfully. The technical qualities assure the quality of the selection of raw materials, knowledge about equipment and machine, quality control capacity and using machine with energy efficiency.

Table 2 shows that only two percent of EW had 'good' level of technical qualities, which indicates that only these women had the ability to select appropriate raw materials for enterprise, could handle equipment and machine and save energy successfully. They also had ability to maintain quality of products. About one – third i.e. 32 percent were at 'average' level i.e. these women at times did not have much knowledge about selection of raw materials, could not handle equipment and machine very efficiently, they also wasted energy while doing work and had little knowledge about maintenance of quality of products. A large number i.e. 64 percent of EW were at 'poor' level of technical qualities which meant that they were poor at acquiring as well as managing technical qualities like selecting raw materials for enterprise, knowledge about handling equipment and machine, they also lacked in knowledge about saving energy and had no ability of maintaining quality of products. Very few i.e. two women were at 'very- poor' level which means that these EW rated themselves 'very poor' in all selected traits related to technical dimension like they had negligible ability to select appropriate raw materials for enterprise, couldn't handle equipment and machine, were not able to save energy while doing work and they had negligible ability to maintain quality of products.

Very few of NEW i.e. seven percent were falling at 'average' level which meant, these women did not have much knowledge about raw materials, could not handle equipment and machine very efficiently, they wasted energy while doing work and had little knowledge about maintenance of quality of products. 30 percent of NEW had 'poor' level of technical qualities which indicates that they were poor at selecting raw materials for enterprise, poor at handling machine and equipment, they also lacked in knowledge about saving energy and had no ability in maintaining quality of products. And majority of NEW i.e. 63 percent were at 'very poor' level of technical qualities, which implies that they felt that they had negligible ability to select accurate raw materials for enterprise, could not handle equipment and machine, were not able to save energy while doing work and they had no ability to maintain quality of products. This data clearly shows that NEW were very poor in technical knowledge, it is not a good indicator as this restricts NEW to become EW, which ultimately slows down business growth in the local area. So, it can be concluded that both EW and NEW were lacking in technical qualities. Majority of EW were falling at 'poor' level and majority of NEW were falling at 'very poor' level of technical qualities. Poor technical knowledge is a big barrier to enterprise.

The average score on technical sub- dimension are being given in fig.4.2, it shows that EW had average score value as 6.60 and on the other hand NEW had average score value as 3.57, and therefore they both had 'poor' level of technical qualities. Poor technical knowledge is a big barrier to enterprise; training to improve their knowledge related to technical traits is required for both the categories.

(iv) Financial sub – dimension: Finance is the lifeblood of the enterprise. Entrepreneur has to take certain steps and follow specified norms of the financial institutions. In fact, it is the finance, which pools together the other resources like man, machine, material and method to start and run the enterprise. The significance of finance in production is elucidated like a lubricant to the process of production. As such raising of finance and maintaining it for an enterprise is the most important function of an entrepreneur. Various aspects involved were knowledge about rebates in taxing, achieving financial flexibility, return on investment and effective financial control.

The data in table 2 shows that only three percent of EW were at 'good' level of financial qualities, which

indicates that they believed that they had some knowledge about rebates in taxing, financial flexibility, knowledge about returns on investment and had financial control. 30 percent were at 'average' level i.e. they did not possess much knowledge of rebates in taxing, did not have financial flexibility, were not able to get returns on investment satisfactorily and they did not have much control over their money. More than half i.e. 56 percent of EW were at 'poor' level of financial sub-dimension, which implies that these women had poor knowledge about rebates in taxing, they did not know much about taxing, poor at achieving financial flexibility, were getting poor returns on their investment and could not control their finances. Rest eleven percent women had 'very poor' financial qualities which indicates that they had negligible knowledge about rebates in taxing, had not achieved financial flexibility at all, were not getting any return on their investments and had zero control over their money.

Forty-one percent of NEW were at 'poor' level of financial qualities which means that they knew that they perceived that they had poor knowledge about rebates in taxing, had poor financial flexibility, will get poor returns on investment and will not be able to control their finances. Rest NEW i.e. 59 percent were at 'very – poor' level of financial qualities which implies that they perceived that they had negligible knowledge about rebates in taxing, had no financial flexibility at all, will not be able to get returns on investment fully and had nil control over their money. It clearly gives information that NEW especially need training in developing financial traits as they were at 'poor' and 'very poor' levels of financial qualities, this is going to affect not only their success but their entry in entrepreneurial world.

(v) Legal sub- dimension: For establishment and management of a new venture or setting up of a small scale enterprise, entrepreneurs come across a number of situations to follow laws of the land. Right from the conception stage in promoting the enterprise, entrepreneurs should be careful to obey the legal formalities, procedures, policies and plans for the government so as to make themselves free from any sort of legal hassles in future. The legal qualities in the entrepreneurs are important for smooth running of their enterprise. Legal aspects selected in this study were knowledge about acquisition, patent, consumer protection laws and various environmental regulations.

The data given in table 2 clearly shows that very small sample i.e. four percent of EW had 'average' level of legal qualities which implies that women felt that they had very little awareness about acquisition of land, patent, consumer protection laws and various environmental regulations. And majority of respondents 57 percent had 'poor' level of legal qualities, which meant that they were not aware of acquisition, patent, consumer protection laws and environmental regulations. Rest 39 percent of EW were falling at 'very poor' level of legal qualities which means that these women had reported that they had negligible knowledge about acquisition, patenting, consumer protection laws and various environmental regulations. It is clear that EW were lacking in legal skills.

Twenty- four percent of NEW said that they had 'poor' level of legal qualities, which implies that they were not aware about acquisition, patent, consumer protection laws and environmental regulations. Rest of the sample i.e. 76 percent were falling at 'very-poor' level of legal qualities, which indicates that they had negligible knowledge about acquisition of land, patenting, consumer protection laws and various environmental regulations. Data clearly shows that NEW had nil knowledge about legal matters concerning to entrepreneurship.

(vi) Trade sub dimension: The trading proficiency is essential for competition and growth. Trade is an important activity of an entrepreneur and deals with buying and selling of goods in order to earn through profits. Trade capabilities are very important in order to enhance any enterprise. The trade activities in the study included: product- pricing, knowledge about market trends, understanding contractual terms and publicity of products**.**

The data given in table 2 shows that, five percent of

EW had 'good' level of trade qualities it means, these women had good knowledge about fixing product price, were capable of understanding contractual terms, had awareness regarding market trends and could advertise (popularize) their products with in locality. Only ten percent were at 'average' level of trade qualities it implies that they did not have much knowledge about fixing their product's price, had not much understanding about contractual terms, were not much aware about market trends and could not advertise their products in the locality. Majority of respondents i.e. 62 percent of EW had 'poor' level of trade qualities, which indicates their little ability to fix product price, inability to understand contractual terms; less awareness regarding market trends and incapability of advertise their products. And rest twenty-three percent were at 'very poor' level of trade qualities, which implies that they had nil ability to fix product price, understand contractual terms, had negligible awareness about market trends and could not advertise their products at all.

Half of the NEW i.e. 50 percent were at 'poor' level which indicates that they felt that they had poor ability to fix product price, could not understand contractual terms, had poor awareness regarding market trends and had poor ability to advertise their products in the locality. And rest half of the NEW i.e. 50 percent were at 'very poor' level of trade qualities which indicates that they felt that they had very poor or nil ability to fix product price, very poor at understanding contractual terms, negligible awareness about market trends and could not advertise products at all. It is clear that NEW were lacking in qualities related to trade aspects.

CONCLUSION

The study revealed that entrepreneurial women of Rajasthan scored good to excellent in personal/ physical aspects, good in mental aspects but poor to average in social skills. The entrepreneurship among women will help them in earning money and becoming economically independent. Due to social networking women will develop self-confidence, awareness and ability to marshall environmental support. This will lead to an improvement in not only the women, from the point of view of better health, education and skill but an improvement in her living conditions also by being able to use cleaner fuel, better house, better sanitation facilities and infrastructural facilities. This all will lead to saving of resources like time, energy, transforming woman into stronger personality and an overall improvement in her quality of life. This will result in more efficiency and productivity in entrepreneurs. As an outcome of this woman will be able to earn more profit which may be utilized for furtherance of entrepreneurial growth leading to a continuous cycle of success and happiness.

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Techno-Economic and Infrastructural Constraints Faced by Women Entrepreneurs of Bikapur Block of Faizabad District

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Abstract

In India, women constitute about half of the population and more than 70 percent of the rural unemployed and 60 percent of the total unemployed. Under the present condition of chronic unemployment and under employment the economic position of the women is in a pitiable state. No nation can afford to ignore the development of women. The participation of women in economic activities is necessary not only from the point of view of human resource but also from the objective of raising the status of women in the society. The Planning Commission, Central and State Govt. recognized that women should be in the mainstream of economic development and subsequently came out with various schemes and programme to develop women entrepreneurs.

The Development of Women and Children in Rural Areas (DWCRA) programme is one such programme, which was started in the year 1982 in selected districts with a view to provide technical, financial and marketing support to women entrepreneurs. However the programme could not made a much-desired dent in the socio-economic life of farm women due to various reasons. The present study " Techno-economic and infrastructural constraints faced by women entrepreneurs of Bikapur block of Faizabad District" was conducted with a view to find out various technical, economical and marketing constraints which affected the growth of enterprise of women entrepreneurs under DWCRA programme.

METHODOLOGY

The study was conducted in Bikapur block of Faizabad district. This district was purposively selected for the study as it has completed six year of DWCRA programme and no research has been conducted to study the techno-economic constraints faced by women entrepreneurs. Bikapur block was purposely selected as it has maximum number of women groups (53), which are engaged in small-scale enterprises. In all, 120 respondents (54 entrepreneurs and 66 non-entrepreneurs) were selected from 19 villages. The study was done using Ex-post facto research design. The data from primary sources were collected through a pretested interview schedule, comprising of structured and open –ended questions. Collected data were tabulated and analyzed using statistical techniques.

The operationalization and measurements of each of these characteristics are mentioned below.

1. Technical guidance

It refers to the training in the respective trades to the women entrepreneurs as well as availability of the follow up, guidance available to the entrepreneurs at different stages of enterprise development, such as planning stage, initiation stage and at operation stage. These informations were collected in the form of yes and no answers.

2. Financial assistance

It refers to the availability of assistance of financial nature to entrepreneurs by the agency supporting the

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entrepreneurship in consonance with the provisions of the programme. This assistance was categorized into three following categories.

Category	**Assistance**
No assistance	Non payment of stipend
Inadequate assistance	Payment of stipend only
Adequate assistance	Payment of stipend & revolving fund

3. Availability of raw material

This variable refers to the availability of different kinds of raw materials required for the enterprise. There are various aspects of availability namely, timely availability, regular availability and proximity of availability of raw material. Here in this study we have considered whether the raw material is available with the entrepreneurs of at local level or at town level.

4. Marketing facilities

Marketing refers to the disposal of final product at an appropriate price in appropriate time and at an appropriate place through a convenient channel from the production centre to nearby area. The information on their perceptions on these aspects was collected from the entrepreneurs.

Category	**No. of items of infrastructure**
Inadequate	Upto 4 items
Somewhat adequate	5 to 8 items
Adequate	9 to 13 items

RESULTS AND DISCUSSION

The development of enterprise depends upon the availability of various facilities, which technical as well as economic aspects are very important. Technical aspects help the individuals in enhancing their knowledge and skill to take up entrepreneurial activity whereas finance is the backbone of any enterprise. Local and timely availability of raw material and timely disposal of the final products, at a reasonable price and the infrastructure facilities plays very important role for the rise of an enterprise. In general entrepreneurs don't have proper access to the facilities. The constraints faced by rural entrepreneurs because of this situation have been studied here.

1. Technical guidance

Knowledge gain varied from 33.33 per cent to 100 per cent. In case of Mombatti making respondents gained 100 per cent knowledge followed by Zari work and Bari papad (75.00 per cent). Under Achar making trade only 33.33 per cent respondents said yes.

Over all out of 120 respondents (12.10) only 74 gave answer in yes. That means overall gain in knowledge was 61.67 per cent.

Table 1: Perception of respondents regarding additional knowledge gained through training

Sl. No.	Trades	Knowledge gained			
		Yes	N=74	No	N=46
1.	Achar	4 (33.33)		8 (66.67)	
2.	Agarbatti	6 (50.00)		6 (50.00)	
3.	Bari Papad	9 (75.00)		3 (25.00)	
4.	Kaleen work	8 (66.67)		4 (33.33)	
5.	Masala	7 (58.33)		5 (41.67)	
6.	Mombatti	12(100.00)		-	
7.	Readymade garment	5 (41.67)		7 (58.33)	
8.	Recsine	6 (50.00)		6 (50.00)	
9.	Tatpatti	8 (66.67)		4 (33.33)	
10.	Zari work	9 (75.00)		3 (25.00)	
	Overall N=120	74 (61.67)		46 (38.33)	

Besides increase in knowledge, the basic purpose of training is to develop skill, bring about behavioral change to see the impact of training in terms of general information, managerial, specific knowledge and skill development. After completing the training respondents should have developed skill and should know how to manage their enterprises at every step. Maximum numbers of respondents (66.67 per cent)

of readymade garment trade were observed for skill development followed by Kaleen work respondents (58.33 per cent). Whereas in case of specific knowledge Recsine trade and Bari papad trade respondents showed maximum gain (58.33 per cent) (Table 2).

Result indicated that remaining trades respondents did not gained even upto 50 percent in specific knowledge as well as skill development. Respondents gained lesser skill development and managerial aspect, which is very important for an enterprise. These may be one of the reasons for not blooming up of rural women entrepreneurs.

At planning stage maximum (51.85 per cent) respondents received guidance. But as the stages got synchronized with the reality the guidance by the trainer/ officers did not proceed with them. Table 3 showed that at Initial stage only 48.15 per cent respondents received guidance whereas at operational stage guidance was seen lacked. This seems the lack of follow up by the officers, resulting failure of the enterprises.

2. Financial Assistance

It is 1.80 per cent women who did not receive even the stipend while 38.89 per cent women received stipend as well as financial help through revolving funds. The number of women who received only stipend was 59.26 per cent. Table 4 shows that about 70 per cent respondents did not receive any fund for the enterprise. Kumar (1982) also reported the lack of finance.

3. Availability of raw material

It was found that 57.41 per cent respondents were getting raw material from the local market whereas 40.74 per cent respondent used to obtain raw material from nearby towns. The respondents engaged in Agarbatti and Tatpatti were the more prone to for raw materials in town.

Period of disposal was studied and was found that only27.78 per cent entrepreneurs were able to dispose off their product immediately whereas more than 42 per cent entrepreneurs had delayed disposal of the product. About 30 per cent respondents had to face uncertain situation regarding the disposal of products.

Table 2: Respondents perception regarding the type of gains they received from the training

Sl. No.	Type of Trades	General Information	Managerial	Specific Knowledge	Skill development
1.	Achar	11 (91.67)	0 (0.00)	1 (8.33)	0 (0.00)
2.	Agarbatti	3 (25.00)	0 (0.00)	5 (41.67)	4 (33.33)
3.	Bari Papad	3 (25.00)	0 (0.00)	7 (58.33)	2 (16.67)
4.	Kaleen work	0 (0.00)	0 (0.00)	5 (41.67)	7 (58.33)
5.	Masala	8 (66.67)	0 (0.00)	4 (33.33)	0 (0.00)
6.	Mombatti	3 (25.00)	0 (0.00)	5 (41.67)	4 (33.33)
7.	Readymade garment	2 (16.67)	0 (0.00)	2 (16.67)	8 (66.67)
8.	Recsine	4 (33.33)	0 (0.00)	7 (58.33)	1 (8.33)
9.	Tatpatti	6 (50.00)	0 (0.00)	3 (25.00)	3 (25.00)
10.	Zari work	2 (16.67)	0 (0.00)	5 (41.67)	5 (41.67)
	Overall =120	42 (35.00)	0 (0.00)	44 (36.67)	34 (28.33)

Table 3: Distribution of respondents according to their stage of getting guidance received at various stages of enterprise development

Sl. No.	Trades	Planning stage N=28	Initial stage N=26	Operational stage
1.	Achar	1 (100.00)	-	-
2.	Agarbatti	8 (66.67)	4 (33.33)	-
3.	Bari Papad	5 (41.67)	7 (58.33)	-
4.	Kaleen work	-	-	-
5.	Masala	1 (50.00)	1 (50.00)	-
6.	Mombatti	1 (100.00)	-	-
7.	Readymade garment	1 (8.33)	11 (91.67)	-
8.	Recsine	2 (100.00)	-	-
9.	Tatpatti	9 (75.00)	3 (25.00)	-
10.	Zari work	-	-	
Overall N=120		28 (51.85)	26 (48.15)	-

Result indicated that 74.07 per cent of the respondents reported to get lesser prices for their product whereas 25.93 per cent entrepreneurs were satisfied with the price, they were getting for the product. Sharma (1990) also revealed that product were sold at low prices in the market. Small entrepreneurs don't have that much money to invest again and again they need the reasonable and timely money for their products. Lesser price again and again may be pushed them to bind their enterprises.

Table 4: Distribution of the respondents according to the financial assistance

Sl.No.	Type of Financial Assistance	Working entrepreneurs N=54
1.	No stipend	1 (1.80)
2.	Stipend only	32 (59.26)
3.	Stipend + revolving fund	21 (38.89)

Table 5: Distribution of entrepreneurs according to the availability of raw material

Sl. No.	Trades	Medium of availability		
		Local market N1=31	Town N2=22	Self N31
1.	Achar	1 (100.00)	-	-
2.	Agarbatti	2 (16.67)	10 (83.33)	1 (8.33)
3.	Bari Papad	9 (75.00)	2 (16.67)	-
4.	Kaleen work	-	-	-
5.	Masala	1 (50.00)	1 (50.00)	-
6.	Mombatti	-	1 (100.00)	-
7.	Readymade garment	12 (100.00)	-	-
8.	Recsine	-	2 (100.00)	-
9.	Tatpatti	6 (50.00)	6 (50.00)	-
10.	Zari work	-	-	-
	Overall N=54	31 (57.41)	22 (40.74)	1 (1.85)

Table 6: Distribution of entrepreneurs according to the period disposal of their products

Sl. No.	Trades	No. of entrepreneurs		
		Immediately	Delayed	Uncertain
1.	Achar	-	1 (100.00)	-
2.	Agarbatti	5 (41.67)	6 (25.00)	4 (33.33)
3.	Bari Papad	-	8 (66.67)	4 (33.33)
4.	Kaleen work	-	-	-
5.	Masala	2 (100.00)	-	-
6.	Mombatti	-	-	1 (100.00)
7.	Readymade garment	6 (50.00)	1 (8.33)	5 (41.67)
8.	Recsine	2 (100.00)	-	-
9.	Tatpatti	-	10 (83.33)	2 (16.67)
10.	Zari work	-	-	-
	Overall N=54	15 (27.78)	23 (42.60)	16 (29.62)

Table 7: Distribution of entrepreneurs according to their mode of marketing

Sl. No.	Trades	No. of entrepreneurs		
		Direct to consumer	Shopkeeper	Through middleman
1.	Achar	1 (100.00)	-	-
2.	Agarbatti	4 (33.33)	-	5 (66.67)
3.	Bari Papad	4 (33.33)	5 (41.67)	3 (25.00)
4.	Kaleen work	-	-	-
5.	Masala	2 (100.00)	-	-
6.	Mombatti	-	1 (100.00)	-
7.	Readymade garment	12 (100.00)	-	-
8.	Recsine	2 (100.00)	-	-
9.	Tatpatti	2 (16.67)	-	10 (83.33)
10.	Zari work	-	-	-
	Overall N=54	27 (52.94)	23 (42.60)	21 (38.89)

Study also showed that about 53 per cent respondents use to sell their products directly to consumers whereas 38.89 per cent used to sell their product through middleman. Remaining entrepreneurs use to sell through shopkeeper.

Table 8: Distribution of entrepreneurs according to the price of their proudct

Sl. No.	Trades	No. of entrepreneurs	
		Reasonable	Less price
1.	Achar	1 (100.00)	-
2.	Agarbatti	4 (33.33)	8 (66.67)
3.	Bari Papad	2 (16.67)	10 (83.33)
4.	Kaleen work	-	-
5.	Masala	1 (50.00)	1 (50.00)
6.	Mombatti	-	1 (100.00)
7.	Readymade garment	5 (41.67)	7 (58.33)
8.	Recsine	1 (50.00)	1 (50.00)
9.	Tatpatti	-	12 (100.00)
10.	Zari work	-	-
	Overall N=120	14 (25.93)	40 (74.07)

CONCLUSION

Out of 120 respondents with 10 different trade only 54 respondents have started their enterprises. Some of them could not run their enterprise even a single year. Remaining once was not at very good verge. Financial and marketing problem was the main core to pull women behind for maximum production in some of the trades.

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Farm Advisory Services of Agricultural Technology Information Centre (IARI)

J.P. Sharma[1], Premlata Singh[2], Nishi Sharma[3], Anil Gupta[4] and C.B. Singh[5]

Abstract

Because of the dominance and concentration of small and resource poor farmers, public institutions like Indian Council of Agricultural Research (ICAR) Institutes and State Agricultural Universities (SAUs) will continue to play a vital role in supply of technological information, products and inputs for increasing the overall productivity in agriculture. Through ATICs it was intended to deliver single window services to farmers, entrepreneurs and other visitors bout agriculture. The present study was conducted to identify the profile of visitors and the types of information mostly sought by them.

For every small things like seeds, innovative instruments, technologies standing at crossroads with many profiteering agencies misleading them. Earlier experiences and studies indicated this confusion prevalent among farmers and suggested single window delivery approach to be adopted by all agricultural universities and institute. It aimed at providing them access to appropriate information being available at one place. ATIC were established at SAUs and ICAR institutes for providing diagnostic services like soil testing, plant-livestock health and supply research products like plants, seeds, innovative planting materials breeds of animals, processed products. Dissemination of information to farmers was also emisaged as an important aim.

The ATIC of IARI was established in 2000 with the above mention objectives. It has been over eighth years that ATIC has been functioning and it was felt that there is a need to assess the impact it was having. The present study was designed.

The facility of a 'single window' approach at the entrance of the ICAR Institutes/ State Agricultural Universities will enable farmers to have the access to the required information for the solutions to their problems related to the areas in which the concerned institution is engaged. The establishment of Agricultural Technology Information Centre (ATIC) is intended to provide such mechanism, beyond individual units of research information. This will serve as a single window system with an objective to help the farmers and other stakeholders both to provide solution to their location specific problem and make available all the technology information along with technology inputs and products for testing and use by them.

IARI is frequently visited by a large number of farmers, extension workers, entrepreneurs, etc., from different parts of the country. Many of them require specific information/ assistance on various aspects of technology transfer. Since IARI has a sprawling campus of about 500 hectares and consists of 20

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discipline-based divisions and six multi-disciplinary centres/ project directorates, the visitors generally find it difficult to contact the concerned scientists/ divisions for obtaining needed information/ assistance quickly. Therefore, with a view to providing a single window delievery system to the visitors, Agricultural Technology Information Centre (ATIC) has been established at IARI under the National Agricultural Technology Project (NATP) of the ICAR with the following objectives:

1. To provide a single window delievery system for the products and services to the farmers and other interested groups as a process of innovativeness in technology dissemination.
2. To facilitate direct access of the farmers to the institutional resources available in terms of technology advice, technology products etc., for reducing technology dissemination losses.
3. To provide mechanism for feedback from the users to the Institute.

METHODOLOGY

The study was conducted for ATIC at IARI, New Delhi. The sample of the study consists of all beneficiaries from year 2000-05 who visited ATIC for various purposes. In order to study the farm adivisory services rendered to the visitors, the data were collected systematically of all the beneficiaries about its advisory services and feedback of farmers and other stakeholders were compiled. The data were analysed using percentages and bar digrammes.

RESULTS AND DISCUSSION

I. Number of beneficiaries contacted through different methods from year 2000-05

Table 1 gives the number of beneficiaries to whom farm advisory services have been provided since the year 2000.

As shown in Table 1, from the year 2000 onwards, 48,878 farmers have been advised in agriculture and animal husbandry. There has been a steady rise in the number of farmer beneficiaries since 2002 and at present it is above 11,000 per year. As far as the contact method is concerned it is evident that the majority of the farmers have contacted ATIC through personal visits to ATIC (44, 192); 3,536 through telephone Help line and 1147 through letters. This points towards the usefulness of ATIC as more and more farmers are coming forward to avail the services, especially through personal visits.

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Table 1: Farm Advisory Services in Agriculture/animal Husbandry

S. No.	Contact Method	No. of farmer beneficiaries advised						
		2000	2001	2002	2003	2004	2005	Total
A	Personal visit to ATIC	2642	3045	8780	8234	10841	10650	44192
B	Through letters	210	236	160	180	197	164	1147
C	Telephone helpline	Nil	446	484	470	1176	960	3536
	Total	2852	3727	9424	8884	12214	11774	48875

telephone Help line and 1147 through letters. This points towards the usefulness of ATIC as more and more farmers are coming forward to avail the services, especially through personal visits.

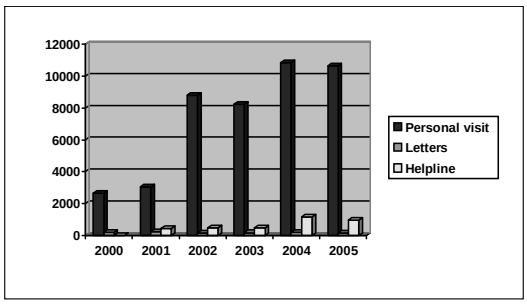

Figure 1: Farm Advisory Ser vices in Agriculture /Animal Husbandry

II. Classification of farmers visiting ATIC based on distance from ATIC

From how far off distances are farmers coming to avail services of ATIC, IARI. Table 2 shows the classification of farmers visiting ATIC based on distance from their farms.

Table 2: Classification of farmers visiting ATIC based on distance of their farms from ATIC (2002-2005)

S. No.	Distance in KM	No. of farmers	Percentage
1.	≤ 50	8216	18.99
2.	51-100	11243	25.99
3.	101-150	7784	18.00
4.	151-200	5189	11.99
5.	201-250	3459	7.99
6.	251-300	3027	6.99
7.	301-350	1730	4.00
8.	≥350	2595	6.00
	43244	100	

Classification of farmers visiting ATIC, based on distance of their farms from ATIC (Table-2) shows that majority of them are coming from a distance of 50-150km. These farmers are mainly from Delhi villages and the National Capital Region of neighboring U.P and Haryana. Some farmers are even coming from far off places (above 350km). This again shows the utility of ATIC where farmers on their own interest are coming for advisory services.

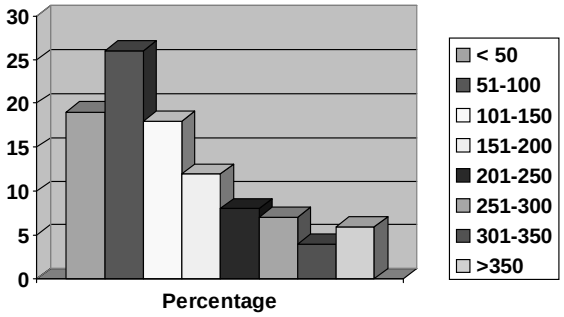

Figure 2: Classification of farmers visiting ATIC based on distance of their farms from ATIC (2002-2005)

III Gender-wise distribution of farmers visiting ATIC

However, the distribution of farmers based on gender (Table-3) clearly points out that while 88 percent are men, only 12 percent are women farmers. More women farmers need to be encouraged and facilitated to take advantage of ATIC services because of their active participation in agriculture.

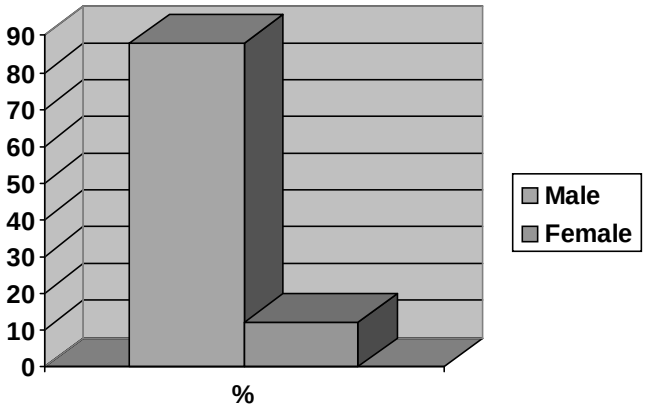

Figure 3: Distribution of farmers visiting ATIC based on gender (2002-2005)

Table 3: Distribution of farmers visiting ATIC based on gender (2002-2005)

Sex	No.	%
Male	38055	88.00
Female	5189	11.99
Total	43244	100

IV. Frequency of visit of farmers to ATIC

Table 4 shows that 40 percent of the farmers visit 2-3 times a year; 28 percent visit 4-6 times a year while 25 percent visit once a year. There are also 5 percent farmers who visit once a month and 2 percent even visit as often as once a week. This again is a pointer towards the usefulness of ATI services of IARI and also depicts the satisfaction of farmers who are willing to visit so frequently.

Table 4: Distribution of farmers visiting ATIC by frequency of visit to ATIC (2002-2005)

S.No.	Periodicity	Frequency	Percentage
1.	Once in a week	865	2.00
2.	Once in a month	2162	4.99
3.	4-6 times a year	12108	27.99
4.	2-3 times a year	17298	40.00
5.	1 time a year	10811	25.00
	Total	43244	100

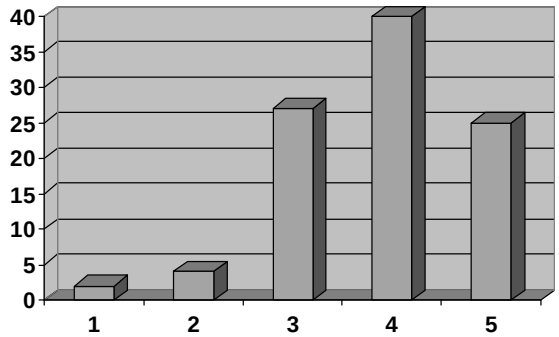

Figure 4: Distribution of farmers visiting ATIC by frequency of visit to ATIC (2002-2005

V. Years of association with ATIC

The Table 5 shows that while 30 percent farmers have 3 years of association with ATIC there are 25 percent who have one year and more than 3 years. Twenty one percent of the farmers have been associated with ATIC since the last two years.

Table 5: Farmers years of association with ATIC: (2002-2005)

S.No.	Years	Frequency	Percentage
1.	1 Year	10811	25.00
2.	2 Year	9081	20.99
3.	3 Year	12973	29.99
4.	>3 Year	10811	25.00
	Total	43244	100

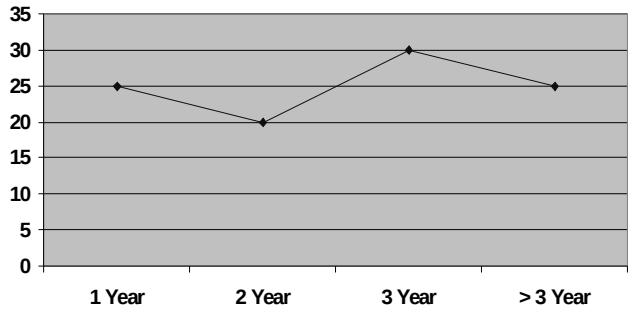

Figure 5: Farmers years of association with ATIC: (2002-2005)

VI. Visit of farmers to ATIC at different time intervals: -

Figure 6 shows that the peak hours of visit to ATIC are from 11.00am. to 1.00pm and then there is another peak between 2.00pm to 4.00pm. Hence the ATIC staff needs to be readily available especially during these periods.

Table 6: Classification of farmers visiting ATIC during different intervals of the day (2002-2005)

Interval of day (Hour)	Frequency	Percent
9 am-10 am	865	2.00
10 am -11 am	2162	4.99
11 am -12 noon	12973	29.99
12 noon-1pm	12108	27.99
1 pm -2 pm	4324	9.99
2 pm -3 pm	9514	22.00
3 pm -4 pm	4324	9.99
4 pm -5 pm	1297	2.99
Total	43244	100

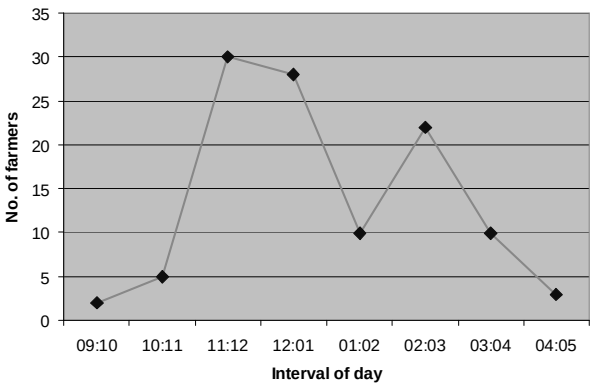

Figure 6: Classification of farmers visiting ATIC during different intervals of the day (2002-2005)

VII. Classification of farmers based on purpose of enquiry:

According to the Figure 7 maximum number of enquiries are for seeds/varieties (19,624) followed by horticulture (10,637), plant protection (8232), farm literature (7970) and agro- based enterprises (7077). Hence farmers are showing a lot of interest in IARI seeds/varieties and also in horticulture. They also have a lot queries related to plant protection. Horticulture has a good potential in peri-urban agriculture and farmers are also interested hence thrust needs to the given to this area.

Table 7: Classification of farmers based on Enquiry (2000-2005)

S.No.	Purpose of enquiry	Rank
1.	Seeds/varieties	I
2.	Horticulture (Plants, medicinal etc.	II
3.	Plant Protection	III
4.	Agro based enterprise	V
5.	Farm literature	IV
6.	Dairy	VI
7.	Ag. Implements	VIII
8.	Others	VII

Feedback from farmers and other stake holders:

- In general IARI products have high demand among the farmers and they are satisfied with the quality of the products.
- Among wheat varieties farmers preferred HD - 2687, HD- 2329, HD - 2643 and HD - 2285 in the order of preference.
- In case of mustard farmers preferred Pusa Jai Kisan, Pusa bold, Pusa Agrani (for early as well as late sowing).
- There was high demand for rice varieties PB-1, Sugandh –4 which are basmati types. The demand for scented hybrid rice PRH-10 was also considerable. In coarse rice Pusa -44 continued to be in demand. These varieties need to be produced in large quantities to meet the farmer's need.
- Surprisingly about 20 percent of the visitors were interested on information related to agro- based enterprises like mushroom cultivation, bee-keeping, fisheries, vermiculture and medicinal plants.

- Farmers and entrepreneurs also expected help from ATIC about the project profiles on various agro-based enterprises. A good booklet on medicinal plants having information on package of practices, processing and marketing facilities is also needed.
- Amrapali, Pusa Arunima, Pusa Surya varieties of mango are in great demand and more seedlings need to be produced to cater the demand.
- Help line concept first time initiated by the IARI is a great success and the centre received calls from far off places like Andhra Prades, Bihar, Uttaranchal, Himachal Pradesh. Even farmers not having telephone facility at their house, made calls form STD/PCOs booths. Concept of Helpline led to establishment of call centers by Ministry of Agricultural, Govt. of India which was inaugurated on 21st January 2004. IARI is working as a second level of K.C.C. This service has proved to be very effective and useful for the farmers.

CONCLUSION

Study brought to light the usage pattern of ATIC by beneficiaries. It has been found that visitors of ATIC are increasing with time and most frequently through personal visits. Majority of beneficiaries are male coming from distance of 100 km from Centre and they have contact with the centre for more than three years. This indicates the higher satisfaction level of beneficiaries. The feedback of beneficiaries is important for researchers to match their research towards the needs of ultimate users. To conclude farmers are availing ATIC services and there is an increasing demand with time.

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Managerial Competencies of Women Business Owners

Rashmi Singh*

Abstract

The present study aimed at finding out the critical entrepreneurial competencies established women entrepreneurs possess. These competencies help them to establish and manage their enterprises so as to earn profits and be successful. Entrepreneurial traits like initiative, opportunity seeking, self confidence, persuasion ability, assertiveness, influence, persistence, information seeking, concern for high quality (quality consiousness), commitment, sense of efficacy, systematic planning and problem solving, contribute to the competence of an entrepreneur and thus affect her entrepreneurial performance. It was found that in general, the respondents were found to possess high competence in thirteen entrepreneurial traits studied. Further comparison between the Low Profit Earners and High Profit Earners showed that HPE entrepreneurs were found to be having higher entrepreneurial competence scores than the LPE respondents. Low Profit Earning women entrepreneurs, thus, were found to be low in four dimensions: self-confidence, assertiveness, persuasion ability and influence. Systematic Planning and Initiative were in the medium range for both the groups. Initiative, Opportunities Seeking Behaviour and Commitment for Quality scores were found to be higher in Low Profit Earners than High Profit Earners. In respect of Efficacy and Problem Solving, High Profit Earners scored higher than the Low Profit-Earning members. Thus, the members of the two groups were found to have some intrinsic difference between them in entrepreneurial competence.

Development of any region is dependent on effective utilization of the available resources in general and human resources in particular. If the human resources of a country are able and efficient, then they can convert available physical, natural and financial resources into productive ventures. The main factor on which development of a nation depends is its human capital. This becomes of paramount importance in the case of developing countries like India, where abundant human resource is found and in comparison other resources are scarce. Human resource development has moved to the center of the global development debate. The aim of human development is that all people can enjoy long, healthy and creative lives. In fact, it is a synonym with gender equity and equality.

Global changes have created economic opportunities for women who are now owning and operating their own business. Depending on which economy was referred to, women entrepreneurs were between 15 per cent to 35 per cent of all entrepreneurs. In India too, presently women entrepreneurs comprise about 11 per cent of the total entrepreneurs in India and this number is steadily growing every year. It is expected that 25-30 per cent of the entrepreneurial force in India would be women by 2020. The skills they possess are critical to manage their enterprises effectively. Entrepreneurial traits are the factors

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which result in their entrepreneurial success. Research studies have proved again and again that entrepreneurs are not born but can be developed indicating that these traits can be inculcated in potential entrepreneurs through training interventions. In view of this, the present study aimed at assessing the entrepreneurial and managerial competencies of women entrepreneurs.

METHODOLOGY

The research design followed in the investigation was 'Ex-post facto'. Women headed/managed enterprises constituted units of investigation and women entrepreneurs were the respondents. The women entrepreneurs' experiences, their socio-economic and entrepreneurial antecedents yielded necessary data for the exploration. The study was conducted in the National Capital Region of Delhi including Gurgaon (Haryana) and NOIDA (Uttar Pradesh). The area is endowed with good infrastructure for manufacturing, servicing and marketing along with some functioning entrepreneurship parks. In addition, there are many institutions in the area, which are engaged in Entrepreneurship Development for women. The total sample size comprised of 210 women entrepreneurs. The data were collected through personal interviews using structured schedule based on the variables to be studied. Data were analyzed using frequency and percentages.

Competence has been defined as an underlying characteristic of a person which results in effective and/or superior performance on a job. Competencies are related set of skills, knowledge and attributes which jointly determine level of performance on a job.

A personal Entrepreneurial Competence (PEC) instrument developed by International Centre for Entrepreneurship and Career Development (ICECD), Ahmedabad (1988) was used in present investigations to determine respondent's entrepreneurial competence.

The details of the instrument have been given below.

PEC Instrument

Initiative

* Does things before being asked or forced to by events.

Opportunity Seeking

* Acts to extend the business into new areas, products or services.
* Seizes unusual opportunities to start a new business, obtains finances, equipment, land, workspace or assistance.

Persistence

* Takes action in the face of a significant obstacle
* Takes repeated actions or switches to an alternative strategy to meet a challenge or overcome an obstacle.
* Takes personal responsibility for the performance necessary to achieve goals and objectives.

Information Seeking

* Personally seeks information from clients, suppliers and competitors
* Does personal research on how to provide a product or service
* Consults experts for business or seeks technical advice.

Quality

* Finds ways to do things better, faster, or cheaper
* Work meets agreed upon standards of quality.

Commitment to the work contract

* Makes a personal sacrifice or expends extraordinary effort to complete a job
* Pitches in with workers or in their place to get a job done
* Strives to keep customers satisfied and places long-term goodwill over short-term gain.

Demand for Efficiency

* Acts to do things that meet or exceed standards of excellence.
* Develops or uses procedures to ensure work is completed on time.

Systematic Planning and Monitoring

* Plans by breaking large tasks down into time-constrained sub-tasks.
* Revises plans in light of feedback on performance or changing circumstance.
* Keeps financial records and uses them to make business decisions.

Problem solving

* Solves problems by proper strategizing.
* Thinks of various alternatives and new ways of solving problems.
* Looks for solution rather than being fatalistic.

Self-Confidence

* Expresses confidence in own ability to complete a difficult task or meet a challenge.
* Is hopeful of finding ways on basis of self-competence.

Assertiveness

* Asserts in face of opposition or ambiguity.

Persuasion

* Uses deliberate strategies to influence others.
* Uses key people as agents to accomplish her own objectives.
* Uses strategies to persuade others.

Influence

* Exercises indirect control by influencing others.

RESULTS AND DISCUSSION

Entrepreneurial traits like initiative, opportunity seeking, self confidence, persuasion ability, assertiveness, influence, persistence, information seeking, concern for high quality (quality consiousness), commitment, sense of efficacy, systematic planning and problem solving, contribute to the competence of an entrepreneur and thus affect her entrepreneurial performance. As per the instrument already developed by International Centre for Entrepreneurship and Career Development (ICECD), Ahmedabad, data were collected from the respondents in respect of the above mentioned thirteen traits.

The data thus collected were divided into quartiles and frequencies of respondents falling in each quartile are given in the Table 4.3. Women entrepreneurs were found to be on the higher side of entrepreneurial competence in general as per the data. Majority (55.3%) of the respondents obtained scores upto 241 which is indicative of fair to good entrepreneurial competence while 44.7 per cent respondents were having very good or excellent scores on the entrepreneurial competence scale.

Table 1 : Quartile distributions of respondents as per entrepreneurial competence scores

Quartile	Score	LPE		HPE		Total	
		Freq.	%	Freq.	%	Freq.	%
I	Upto 221	34	32.4	20	19.8	54	26.2
II	222 to 241	29	27.6	31	30.7	60	29.1
III	242 to 251	22	20.9	27	26.7	49	23.8
IV	252 to 277	20	19.0	23	22.8	43	20.9
Total		105	100.0	101	100.0	206	100.0

A comparative analysis of the data obtained by low profit earners and high profit earners, revealed that more women entrepreneurs (32.4%) in the first group had fair entrepreneurial competence than those in the second group (19.8%). On the other side, 49.5 per cent of HPE respondents were having very good and excellent entrepreneurial competence while only 39.9 per cent of LPE women were having such scores. Thus, HPE entrepreneurs were found to be having higher entrepreneurial competence scores than the LPE respondents. The high profit earners were more competent than the low profit earners. On considering the thirteen competencies separately, both the groups were found similar with no difference or very minor difference in the range of scores on persistence (12 to 24 in both groups), information seeking (14 to 25 for LPE and 15 to 25 for HPE), commitment (13 to 23 for LPE and 12 to 23 for HPE), systematic planning (10 to 23 in both groups), self confidence (9 to 24 for LPE and 9-25 for HPE), assertiveness (8 to 25 in both groups) and persuasion ability (8 to 24 in both groups). In both the groups, women entrepreneurs scored less on the dimensions of self confidence (minimum being 9), assertiveness (minimum score being 8), persuasion ability (minimum 8) and influence (minimum score being 8 for LPE and 5 for HPE). Women entrepreneurs, thus, were found to be low in these four dimensions; self-confidence, assertiveness, persuasion ability and influence. Systematic Planning and initiative were in the medium range for both the groups. Initiative, seeking opportunities and commitment for quality scores were found to be higher in low profit earners than high profit earners. In respect of efficacy and problem solving, high profit earners scored higher than the low profit-earning members. Thus, the members of the two groups were found to have some intrinsic difference between them in entrepreneurial competence.

For in depth analysis, each of the thirteen competencies is discussed separately below:

Initiative

This characteristic is reflected in behaviour when a person does things before being asked or forced to by events. It was measured as per the instrument developed by ICECD, details of which are given in the chapter on Research Methodology. The data thus collected are presented in the Table 2.

A large number of respondents (29.1%) scored low on initiative, 25.7 per cent medium scorers, 23.8 per cent high scorers whereas 21.4 per cent scored very high scores.

A comparative analysis brings out the difference in the two groups, low profit earners and high profit earners. 62.9 per cent of the respondents in the former group were found to be low to medium scorers on initiative whereas 53.4 per cent in high profit earning group found their place on the other pole of the scale i.e. high and very high. Thus, LPE women entrepreneurs were found having less initiative as compared to HPE group. This is an important

Table 2: Quartile distributions of respondents as per their scores on initiative

Quartile	Score	LPE		HPE		Total	
		Freq.	%	Freq.	%	Freq.	%
I	Upto 16 (low)	36	34.3	24	23.8	60	29.1
II	16 to 17 (medium)	30	28.6	23	22.8	53	25.7
III	18 to 19 (high)	22	20.9	27	26.7	49	23.8
IV	20 to 25 (very high)	17	16.2	27	26.7	44	21.4
Total		105	100.0	101	100.0	206	100.0

Table 3: Quartile distribution of respondents on the basis of scores of sensing opportunities

Quartile	Score	LPE		HPE		Total	
		Freq.	%	Freq.	%	Freq.	%
I	Upto 16 (low)	31	29.5	32	31.7	63	30.6
II	16 to 17 (medium)	25	23.8	17	16.8	42	20.4
III	18 to 19 (high)	26	24.8	29	28.7	55	26.7
IV	20 to 25 (very high)	23	22.8	23	22.7	46	22.3
Total		105	100.0	101	100.0	206	100.0

attribute of an entrepreneur in which the LPE lagged behind.

Sensing Opportunities

An entrepreneur seeks and acts on available opportunities. Sensing opportunities in the environment and capitalising on them is one of the important entrepreneurial traits which adds to the competence of an entrepreneur. This was measured by ICECD instrument. The data so obtained were processed and presented in Table 4.3.2. About one-third of the sample (30.6%) scored low (upto 16) and almost half (49%) of the respondents scored high and very high (19 to 26) on this scale.

It was evident that 53.3 per cent respondents in low profit earning group scored low to medium (upto 18) while 51.4 per cent respondents from high profit earning group scored more than 18 i.e. were found to be more competent in respect of seeks and acts on opportunities or sensing opportunities. Thus, more respondents in high profit earning group were adept at sensing opportunities in the environment and capitalised on them for their entrepreneurial endeavours as compared to low profit earners.

Persistence

Working doggedly towards ones goals continuously and even after failures is termed as persistence. Persistence rather than flitting from one job to other activity is required for single minded focus on one's goal in the process of entrepreneurship.

This was measured with the help of a scale developed for the purpose. This scale produced persistence score ranging from 12 to 24 with an average of 17.38. The obtained scores were divided into four quartiles and the data are presented in Table 4. It was quite heartening to see that the largest number of women entrepreneurs (34.9%) scored high (18 to 20) on this scale.

Table 4: Quartile distribution of respondents as per their scores on persistence

Quartile	Score	LPE		HPE		Total	
		Freq.	%	Freq.	%	Freq.	%
I	Upto 15 (low)	28	26.7	29	28.7	57	27.7
II	16 to 17 (medium)	26	24.8	28	27.7	54	26.2
III	18 to 20 (high)	37	35.2	35	34.7	72	34.9
IV	21 to 24 (very high)	14	13.3	9	8.9	23	11.2
Total		105	100.0	101	100.0	206	100.0

Mean = 17.38 IQR=5.0

A comparison between low profit earners and high profit earners showed that the former had on edge over the latter in this respect. This was evident from the fact that a greater number of LPE respondents (13.3%) occupied the highest category than only 8.9 per cent of HPE respondents. It could be concluded that more low profit earners were found persistent as compared to high profit earners. The possible reason may be that the HPE respondents being more ambitious had a tendency to hop from one enterprise to another in search of greater profitability. The LPE respondents on the other hand, had poor risk taking ability and had a tendency to continue with the same enterprise for longer period of time and hence were more persistent.

Information Seeking

Seeking information regarding changes in government policies, new techniques to deliver goods, product manufacturing, opportunities available and perception about market is crucial to entrepreneurial success. It was measured with the help of the scale developed for the purpose by ICECD. The scale produced information-seeking score ranging from 14 to 25 with an average of 20.13. The obtained scores were divided into four quartiles and data presented in the Table 5.

The women entrepreneurs under study were found to be quite competent in seeking information to enhance their business ventures. Majority of the respondents (about 56%) were in the first two quartiles with scores ranging from 14 to 20; but over 40 per cent of them fell in third and fourth quartile with about 26 per cent having scores above 22. Though the trend for low profit earners and high profit earners was similar, more women entrepreneurs (3.7%) in the later group were found to have very high scores in the range of 23-25. This appears logical since the high profit earners have to be cosmopolite and would keep themselves update with the technological and market information etc.

Concern for High Quality

Concern for quality of their products and services is one of the important entrepreneurial traits. This was measured by the ICECD scale. The scale produced scores on concern for high quality ranging from 12 to 26 with an average of 18.47. The obtained scores were divided into four quartiles and data presented in Table 6.

The respondents seem to be well distributed over the four quartiles in this respect. But a comparative view of their distribution between LPE and HPE groups was quite interesting.

The latter group scored less on concern for high quality than the former. Majority in LPE (54.3%) respondents occupied the 3rd and 4rth quartile where as only about 42per cent of the HPE respondents found their places in these two higher quartiles. This was a strange phenomenon. But it

Table 5: Quartile distribution of respondents as per their scores on information seeking

Quartile	Score	LPE		HPE		Total	
		Freq.	%	Freq.	%	Freq.	%
I	Upto 19 (low)	39	37.1	34	33.6	73	35.4
II	20 (medium)	22	20.95	21	20.8	43	20.9
III	21 to 22 (high)	25	23.8	24	23.8	49	23.8
IV	23 to 25 (very high)	19	18.1	22	21.8	41	19.9
Total		105	100.0	101	100.0	206	100.0

Mean = 20.13, IQR=3.0

Table 6: Quartile distribution of respondents as per their scores on concern for high quality

Quartile	Score	LPE		HPE		Total	
		Freq.	%	Freq.	%	Freq.	%
I	Upto 17 (low)	26	24.8	36	35.6	62	30.1
II	18 (medium)	22	20.9	22	21.8	44	21.4
III	19 to 20 (high)	36	34.3	31	30.7	67	32.5
IV	21 to 26 (very high)	21	20.0	12	11.9	33	16.0
Total		105	100.0	101	100.0	206	100.0

Mean = 18.47, IQR=3.0

seems that the LPE respondents had higher survival instinct since their livelihood depended on these enterprises, they appeared to have higher concern for the products and services so that their customer may not abandon them.

Commitment

Commitment refers to ones dedication to a cause or principle. In case of women entrepreneurs it gets reflected in the way women do business, making personal sacrifice to complete a job, pitching in with workers to get a job done, striving to keep customers satisfied and placing long term good will over short term gain. This was measured with the help of a scale developed for the purpose. The scale produced commitment score ranging from 12 to 23 with an average of 18.65. The obtained scores were divided into 4 quartiles and data presented in the Table 7.

A large number of respondents (42.3%) scored fair on commitment scores ranging from 12 to 18 whereas a considerable number of respondents (21.8%) scored excellent in the range of 21 to 23. The obtainable scores ranged from 9 to 25 with a mid value of 17. Therefore, 42.2 per cent of the total respondents scored upto mid value whereas more than half of the respondents (57.7%) scored more than the obtainable mid value of 17 indicating that majority were found to be having good commitment level. If we compare the two groups, LPE and HPE, more LPE members (43.8%) were found in the 3rd and 4th quartile as compared to only 34.7 per cent of HPE members in these quartiles. Thus, commitment seems to be more a feature of LPE group whose risk taking ability was low. These women were totally dependent on the earning from their enterprises and could not ignore their customers' happiness as for

Table 7: Quartile distribution of respondents as per their scores on commitment

Quartile	Score	LPE		HPE		Total	
		Freq.	%	Freq.	%	Freq.	%
I	Upto 18 (fair)	42	40.0	45	44.5	87	42.2
II	19 (good)	17	16.2	21	20.8	38	18.4
III	20 (very good)	21	20.0	15	14.9	36	17.5
IV	21 to 23 (excellent)	25	23.8	20	19.8	45	21.8
Total		105	100.0	101	100.0	206	100.0

Mean = 18.65, IQR=2.0

them everything is at stake since livelihood was dependent on their enterprises. This may not be true for HPE members who had other back up plans or support system in case of losses. Or it may be due to the fact that HPE members had established their enterprises and were earning high profits which would have made them relax and take it easy now.

Sense of Efficacy

Sense of efficacy is an important entrepreneurial characteristic which provides self-confidence and conviction to entrepreneurs leading to effectiveness in their endeavours. This was measured with the help of a scale on which the scores vary between 12 and 25 with the mean value of 19.51. All the women entrepreneurs included in the study scored more than 18 indicating thereby that they were above average. When on basis of obtained scores the respondents were placed into four quartiles, 29.1% of them occupied the third quartile and another 17.9 per cent the fourth quartile. Hence these 47 per cent respondents may be considered having very high efficacy. When the two groups of respondents LPE & HPE were compared, the former group of respondents were found to be more efficacious than the latter group of respondents. This was evident from the fact that about half of the former group members could occupy space in third and fourth quartiles as against only 43 per cent of the latter group members.

Nature of enterprise may be responsible for this state of affairs. The enterprise of the LPE members were less sophisticated, less risky, more stable and more self-dependent. Thus the entrepreneurs were confident enough to manage these enterprises with the competence they had.

Systematic Planning

Proper planning and strategising for running an enterprise is an important competency. It helps utilise resources in the best possible manner to earn maximum profit without jeopardizing the health of the enterprise. It was measured with the scale developed by ICECD for the purpose. The scale produced scores on systematic planning ranging from 10 to 23 with a mean value of 17.2. The scores were divided into quartiles and frequency of respondents in each quartile calculated. The data are presented in the Table 9.

Thirty four point five per cent women entrepreneurs were found to be low scorers on systematic planning. Twenty eight point two per cent respondents were medium planners, 20.2 per cent were high planners while only 16.5 per cent were very high on systematic planning.

If the two groups, LPE and HPE were compared, the formers were found to be better planners than the members of latter group. This was evident from the fact that almost half of the LPE group (49.5%) were falling in third and fourth quartiles of high of

Table 8: Quartile distribution of respondents as per the scores obtained on sense of efficacy

Quartile	Score	LPE		HPE		Total	
		Freq.	%	Freq.	%	Freq.	%
I	Upto 18	29	27.6	28	27.7	57	27.7
II	19	24	22.9	28	27.7	52	25.2
III	20 to 21	33	31.4	27	25.7	60	29.1
IV	22-25	19	18.1	18	17.8	37	17.9
Total		105	100.0	101	100.0	206	100.0

Mean = 19.51, IQR=3.0

Table 9: Quartile distribution of respondents as per their scores on systematic planning

Quartile	Score	LPE		HPE		Total	
		Freq.	%	Freq.	%	Freq.	%
I	Upto 16 (low)	41	39.1	30	29.7	71	34.5
II	17 to 18 (medium)	20	19.0	38	36.2	58	28.2
III	19 (high)	25	23.8	18	17.8	43	20.9
IV	22 to 23 (very high)	19	18.1	15	14.9	34	16.5
Total		105	100.0	101	100.0	206	100.0

Mean = 17.20, IQR=3.0

very high planning as compared to only 43.5 per cent respondents from the High Profit Earners. This may be due to the fact that LPE members had everything at stake in their enterprises and not much resource available to them to fritter away, so there was greater need for planning to cut costs of production or services. Since HPE members have cushioning back up available to them, this aspect may not be the criterion as essential for them in comparison to LPE members.

Problem Solving

Competency to solve problems coming up in one's way has a direct relationship with success of entrepreneurial venture. This was measured with the scale developed for the purpose where range of obtainable score was 5 to 25 with mid value as 15. The actual scores obtained were divided into four quartiles and data tabulated in the Table 10.

The scores obtained ranged from 10 to 25 with a mean value of 19.89. Most women entrepreneurs (95%) scored more than possible mid value of 15 and only 5 per cent scored upto 15. Thus, generally, women entrepreneurs were found to be having high problem solving ability. Sixty three point eight per cent of women entrepreneurs were found to be placed in first and second quartiles whereas only 34.2 per cent respondents were placed in third and fourth quartiles. Comparing the two groups, LPE and HPE, it was the latter which was found superior in problem solving competency as compared to LPE members who lagged behind. This was evident with more respondents of HPE falling in third and fourth quartile as compared to LPE members in these quartiles. This might be the reason why earnings of the HPE group were higher as compared to LPE group. Greater problem solving ability resulted in higher earnings and entrepreneurial success.

Table 10: Quartile distribution of respondents as per their scores on problem solving

Quartile	Score	LPE		HPE		Total	
		Freq.	%	Freq.	%	Freq.	%
I	Upto 18 (fair)	32	30.5	24	23.8	56	26.7
II	19 to 20 (medium)	42	40.0	36	35.6	78	37.1
III	21 to 22 (high)	17	16.2	20	19.8	37	17.6
IV	23 to 25 (very high)	14	13.3	21	20.8	35	16.7
Total		105	100.0	101	100.0	206	100.0

Mean = 19.89, IQR=4.0

Self Confidence

Self-confidence is the confidence one has in own abilities, competencies and one's judgement. An entrepreneur expresses confidence in own ability to complete a difficult task or meet a challenge. A self-confident entrepreneur is hopeful of finding ways on basis of self-competence. This was measured for the respondents by the scale developed for the purpose, where range of obtainable scores was 5 to 25 with a mid value of 15. The actual scores obtained into four quartiles and data are presented in the Table 4.3.10. The scores obtained ranged from 9 to 25 with mean value of 17.2. Seventy five per cent of the respondents scored more than the possible mid value of 15 and only 25 per cent scored below mid value. Though in general, women entrepreneurs were not regarded to be very high on self-confidence yet majority scored above mid value. Comparatively, high profit earners were found superior to low profit earners in respect of this competency.

This might be due to the fact that returns gave boost to ones morale. If despite hard work and full efforts on the LPE members' part, remunerations were not high, then their self-confidence gets shaken.

Assertiveness

Assertiveness is the ability to assert in face of opposition or ambiguity. Usually women are associated with non-assertive behaviour, but as entrepreneurs they need to be assertive, otherwise they may loose control on the enterprise which may make the management chaotic.

It was measured with a scale developed for the purpose where obtainable scores could range from 5 to 25 with a mid value of 15. The actual scores were divided into four quartiles and distribution of data are presented in Table 12, where the scores ranged from 8 to 25 with mean value of 17.34.

Twenty five per cent of respondents scored upto mid value of 15 indicating that they were low on assertiveness, though majority (75%) scored above 15 indicating that most women entrepreneurs were assertive in their dealings with employees, clients and others. Comparatively, high profit earners were found to be superior to low profit earners in view that more HPE members occupied second to third quartile as compared to LPE members, most of whom were occupying the first quartile. This might be due to the fact that most LPE members were situated either in rural areas or among lower to middle class social environment. Here assertiveness in women was not a very welcome trait and women were trained to be non-assertive and more tolerant than men. On the other hand HPE members by virtue of being in more liberal social environment were found to be more assertive.

Persuasion Ability

Entrepreneurs have to persuade employees to perform their duties, influence clients to go for their

Table 11: Quartile distribution of respondents as per their scores on self confidence

Quartile	Score	LPE		HPE		Total	
		Freq.	%	Freq.	%	Freq.	%
I	Upto 14	36	34.3	24	23.8	60	29.1
II	15 to 18	29	27.6	31	30.7	60	29.1
III	19 to 20	23	21.9	24	23.8	47	22.8
IV	21 to 25	17	16.2	22	21.8	39	18.9
Total		105	100.0	101	100.0	206	100.0

Mean = 17.22, IQR=6.0

Table 12: Quartile distribution of respondents as per their scores on assertiveness

Quartile	Score	LPE		HPE		Total	
		Freq.	%	Freq.	%	Freq.	%
I	Upto 15	37	35.2	22	21.8	59	28.6
II	16to 18	30	28.6	34	33.7	64	31.1
III	19 to 20	18	17.1	26	25.7	44	21.4
IV	21 to 25	20	19.0	19	18.8	39	18.9
Total		105	100.0	101	100.0	206	100.0

Mean = 17.34, IQR=5.0

products and convince authorities regarding their own viewpoints. All this is essential to achieve business targets and enhance their ventures. This ability was measured with the help of a scale developed for the purpose where obtainable scores could range from 5 to 25 with a mid value of 15. The actual scores obtained were divided into four quartiles and presented in Table 13.

The scores obtained ranged from 8 to 24 with a mid value of 17.14. Almost all of the respondents in general possessed good persuasion ability with scores above the mid value of 15. But still there was more scope to develop their persuasion ability. Comparatively, HPE members were found superior in persuasion ability than LPE members as evident by more HPE members falling in fourth quartile than LPE members.

Influence

Influence as an entrepreneurial competence refers to the ability of an entrepreneur to make others fall aline. It is a kind of power to make others bow without exercising any physical force or statutory authority etc. This was measured on a scale developed for the purpose where obtainable scores could range from 5 to 25 with a mid value of 15. The actual scores obtained were divided into four quartiles and presented in Table 14. The obtained scores ranged from 5 to 24 with a mean value of 17.6. Ten per cent of total respondents scored below obtainable mid value of 15 indicating that they lagged in this aspect.

Majority of LPE respondents (49.5%) scored upto 16 (nearer to obtainable mid value of 15) indicating LPE members lagged behind HPE in respect of influence. The data in the table 4.3.13 revealed that

Table 13 :Quartile distribution of respondents as per their scores on persuasion ability

Quartile	Score	LPE		HPE		Total	
		Freq.	%	Freq.	%	Freq.	%
I	Upto 15	32	30.5	26	25.8	58	28.2
II	16 to 18	40	38.1	38	37.6	78	37.9
III	19 to 20	17	16.2	16	15.8	33	16.0
IV	21 to 24	16	15.2	21	20.8	37	17.9
Total		105	100.0	101	100.0	206	100.0

Mean = 17.14, IQR=5.0

Table.14: Quartile distribution of respondents as per their scores on influence

Quartile	Score	LPE		HPE		Total	
		Freq.	%	Freq.	%	Freq.	%
I	Upto 16	52	49.5	27	26.7	79	38.3
II	17 to 18	17	16.2	25	24.7	42	20.4
III	19 to 20	16	15.2	26	25.7	42	20.4
IV	21 to 24	20	19.0	23	22.8	43	20.8
Total		105	100.0	101	100.0	206	100.0

Mean = 17.61, IQR=4.0

73.2 per cent of HPE respondents fell in upper three quartiles (2,3&4) whereas 49.5 per cent of LPE respondents fell in the first quartile only. This might be due to LPE members' environmental situation where they were placed and feel helpless to have any influence over the non-responding environmental chaos surrounding them. At their level, infrastructural facilities and lacunae were so glaring that women felt helpless in having any remedial measures. Whereas HPE members largely based in urban areas were able to exert influence because in their area, some sort of system was there or because of their background they were able to make things and people fall aline.

CONCLUSION

Intrinsic difference was found between low profit earners and high profit earners in this aspect. Of all the thirteen traits, high profit earners lagged behind low profit earners in terms of persistence, concern for quality and commitment. Initiative, sense of efficacy and systematic planning were found to be much below in both the groups. In terms of seven traits out of thirteen, low profit earners lagged behind high profit earners. These traits were initiative, sensing of opportunities, information seeking, problem solving, self-confidence, assertiveness, persuasion ability and influence. Also, lack of these entrepreneurial traits was found adversely affecting the entrepreneurial performance and resulting into low returns.

Thus these components may be highlighted to women entrepreneurs who may be made conscious of these through behavioral training programmes where these aspects may be included and given special attention. Specific training interventions regarding these managerial competencies of women entrepreneurs may enhance their performance and productivity.

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Adoption of Vermiculture Technology Among Rural Women

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Abstract

Vermiculture technology is a powerful means to blend the inorganic sources of nutrients with the biological renewal sources for achieving balanced biological activities so as to improve and maintain the physical chemical and biological properties of soil. As a biofertilizer it has tremendous potential to wrest the present day agriculture out of food and nutrition crisis. This technology is just taking roots in India. Present paper attempts to explore the knowledge and adoption of vermiculture technology among rural women and the problems faced by them in its adoption. It was observed that rural women had good knowledge and vermiculture technology was adopted to a medium extent. The main problems faced by women were lack of technical guidance and process being complicated and costly which needs to be overcome for wider adoption of the technology.

Modern agriculture with its potential to wrest the country out of food trap and to reach the era of self-sufficiency in food grain production also has brought a plethora of environmental problems. The present day agriculture is no more sustainable in most parts of the country due to environmental degradation, loss in productivity and series of consequent complex problems. Under these circumstances the only way to help farmers and prevent environment pollution is to increase the fertility of available land, using the worm powered technology named "Vermitech". Vermiculture is the process of using earthworms to convert vegetable and animal waste into useful product, namely vermicompost. It has been proved that this eco-friendly vermi-compost produces organic manure containing all the nutrients in an available form which is necessary for the plant growth. So there is a great need to adopt the technology for improvement in agricultural output and environment. Many agencies such as Agriculture Universities, KVKs, ICAR institutes, State Agriculture Department, and NGOs are working in the field of popularizing the technology. In the last few years, Morarka Foundation, an NGO has been encouraging rural women to take up vermi-compost production not only to boost their crop production but also as an income generating activity. As manuring is the prime responsibility of rural women, the Morarka Foundation is popularizing the vermiculture technology among them by organizing training programmes. The present paper is an attempt to study knowledge, level of adoption of vermiculture technology and the problems faced by rural women in its use.

METHODOLOGY

The present study was conducted in purposively selected Navalgarh Panchayat Samiti of Jhunjhunu district. A list of all the beneficiaries from the villages of Navalgarh Panchayat Samiti was obtained from Morarka Foundation which is disseminating vermiculture technology in the study area. The sample of 100 rural women was drawn from this list randomly. Personal interview technique was followed to collect the data from the respondents.

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RESULTS AND DISCUSSION

Knowledge of respondents about vermiculture technology

Knowledge is an important component of behaviour and it plays a major role in the covert and overt behaviour of human beings. Once knowledge is acquired, it helps to develop favourable attitude towards improved practices and thereby motivate the individual to take action in accepting the technology.

An effort was made to study the knowledge of respondents regarding different components related to vermiculture i.e. requirement for its preparation, care and maintenance, advantages and uses of vermicompost. Data in Table -1 regarding the overall knowledge of the respondents in different components reveals that MPS of the respondents ranged from 80-100 which indicates their excellent knowledge in different aspect with the overall mean percent knowledge score of 85.04.Close observation of the table shows that complete knowledge was possessed by the respondents about requirement of preparing vermin-compost (100 MPS) followed by the selection and pretreatment of raw material (98.18 MPS). Further the mean percent knowledge score in remaining components i.e. identification of earthworms and their feed, watering the surface bed, pretreatment and filling of surface bed, considerations before using prepared vermi-compost, care of earthworms, advantages and uses of vermi-compost ranged from 80-89 MPS which indicates good knowledge of rural women in these aspects.

Further the respondents were categorized on the basis of their overall knowledge about vermi-compost. Findings in Table – 2 reveals that all the respondents (100%) had good knowledge about vermi-culture technology and none of them was in the category of average and poor knowledge, which indicates the excellent level of knowledge of the respondents.

Table 1: Component wise knowledge of the respondents about vermiculture technology

S. No.	Components	MPS
1.	Requirements for preparing vermi-compost	100.0
2.	Selection and pretreatment of raw material	98.18
3.	Identification of earthworms and their feed	87.76
4.	Pretreatment and filling of surface bed	89.08
5.	Watering the surface bed	85.63
6.	Considerations before using prepared vermi-compost	80.13
7.	Care of earthworms	85
8.	Advantages and uses of vermi-compost	82.13

Overall mean percent knowledge score - 85.04

Table 2: Distribution of the respondents on the basis of their overall knowledge about vermiculture technology

N=100

S.No.	Knowledge Categories	F/%
1.	Poor	0
2.	Average	0
3.	Good	100

Adoption of Vermiculture Technology by the Respondents

Finding discussed in the previous section indicates that respondents possessed good knowledge about the vermiculture technology. It becomes essential to know that whether they translate knowledge into practices or not i.e. adopt or reject it. Adoption is

the continued use of an innovation by an individual or a group of people over a reasonable period of time (Das Gupta, 1983). In view of this an effort was made to study the adoption of vermiculture technology among the respondents. Their responses about the extent of use of vermiculture technology was recorded on a three point continum of always, sometimes and never. Adoption index (A.I.) for different aspects of vermiculture technology i.e. correct bed preparation, pretreatment of raw material, special variety of earthworms, filling and maintenance of surface bed, care of prepared vermin-compost and its different uses by the adopters were also calculated on the basis of extent of use and time since they were using it.

Adoption index presented in the Table-3 reveals that practices related to correct bed preparation, use of special variety of special variety of earthworms and making bed free form plastic, glass pieces and hard sticks were adopted to the extent of 56-89 percent. The practice of pretreating the raw material by soaking and sprinkling water on it was followed to a low extent (13.6%).

Table 3: Adoption of correct bed preparation, pretreatment of raw material and special variety of earthworms by the respondents

N=100

S. No.	Practices	Adoption Index (%)
(A) Bed preparation		
1.	Making bed 2" above from earth/ ground level	81.8
2.	Making bed under natural shade/ other shades	89.6
3.	Bed near water source	56.6
(B) Raw material		
1.	Pre treating raw material before use	13.6
2.	Making raw material free from plastic, glass pieces, hard sticks etc.	89.6
(C)	**Earthworms**	
1.	Use of special variety of earthworms	89.6

Data in Table-4 reflects that the pretreatment of bed before filling it and using mild insecticides for pretreatment was adopted to a low extent of 13.8 per cent. It was encouraging to note that the right

Table 4: Adoption of correct method of filling bed

N = 100

S.No.	Practices	Adoption Index(%)
1.	Pre treating bed before filling	13.8
2.	Using mild insecticide or neem leaves for pretreatment of bed	13.8
3.	Process of filling bed	
(a)	Filling base of bed with 2" layer of sand	0.0
(b)	Putting 2" thick layer of agricultural waste	75.0
(c)	Covering agriculture waste with the thick layer of cow dung	89.6
(d)	Sprinkling water on bed	89.6
(e)	Leaving the bed for 2-3 days in moist condition	89.6
(f)	Placing a thick layer of earthworms in one side of bed	89.6
(g)	Covering the surface bed with thick layer of waste material- 3"	75.0
(h)	Covering the completed surface bed with jute cloth	0.0
(i)	Again sprinkling clean water	89.6

process of filling the bed was adopted to a good extent (75-89%) while the base of bed filled with sand and covering the completed surface bed with jute cloth was not all adopted by the respondents.

It can been seen from Table-5 that the maintenance of bed like daily watering, filling it once not always were adopted to a good extent (89.6%). While keeping bed and surrounding area neat and clean and free from weeds and unwanted plant growth inside the bed were adopted to very low extent of 20 and 32 percent respectively.

The adoption index in Table-6 points out that the practices related to care of prepared vermi-compost and its different uses were adopted to a good extent of 50-89 percent. The remaining practices i.e. emptying the bed and placing earthworms at safe place away from its enemies in case of not charging the surface bed same day, giving soft organic feed and water to earthworms during transportation were adopted to a very low extent (0-1.0%).

Further an effort was made to categorize the respondents on the basis of their overall adoption of vermiculture technology. Information presented in Table-7 depicts that all the respondents were in the category of medium adoption level, whereas none of them were in high or low adoption category. Some steps of vermiculture technology were not followed systematically by the respondents which resulted in mean percent adoption score of 53.75.

Table 5: Adoption of practices related to maintenance of surface bed by the respondents

N = 100

S. No.	Practices	Adoption Index (%)
(a)	Daily watering the bed for maintaining temperature and humidity	89.6
(b)	Filling bed once not always	89.6
(c)	Keeping bed free from weeds and unwanted plant growth inside the bed	20.2
(d)	Keeping bed and surrounding area neat and clean	32.0

Table 6: Adoption of practices related to care of prepared vermi-compost and its different uses.

N=100

S. No.	Practices	Adoption index (%)
1.	Stop watering over prepared vermi-compost for 2-3 days	89.6
2.	Emptying the bed	1.0
3.	Separating earthworms from prepared vermi-compost	89.6
4.	Putting vermi-compost on Pucca/plastered/rocky floor	83
5.	Not keeping ready vermi-compost in sunlight for more than 4-5 hours for separation of earthworms	89.6
6.	Recharging of bed same day	89
7.	In case of not charging same day earthworms placed at safe place away from its enemies	1.0
8.	Using vermi-compost in different crops, vegetables and fruit plants	82.4
9.	Drying of prepared vermi-compost for 3-4 days under the shade	89.6
10.	Storing prepared vermi-compost at cold place or under shade	89.6
11.	Watering and giving soft organic feed to earthworms during transportation	0

Table 7: Distribution of the respondents on the basis of their overall adoption of vermiculture technology

N=100

S.No.	Categories	F/%
1.	Low adoption (1- 33.3)	0
2.	Medium adoption (33.4-66.7)	100
3.	High adoption (66.8-100)	0

Mean percent score- 53.75

Problems in Adoption of Vermiculture Technology

Adoption of new technologies is not an easy task. One's decision to adopt an improved technology is influenced by many factors such as utility, efficiency, complexity, feasibility, availability and cost of the technology. An individual may face many problems in the adoption of new technologies, which differ from practice to practice. Close observation of the Table 8 reveals that 44 per cent respondents reported lack of technical guidance as a problem in adoption of vermiculture technology though they possessed good knowledge but they wanted to know more about this technology and technical guidance was needed at different stages of using vermiculture technology.

Table 8: Problem faced by the respondents in using vermiculture technology

N=100

S.No.	Problems	F/%
1.	Lack of technical guidance	44
2.	Scarcity of water	25
3.	Costly	25
4.	Complicated process	25
5.	Time consuming	10
6.	Require too much care and maintenance	5
7.	Damage of bed by dogs and cats	5

The problem of scarcity of water was mentioned by one-fourth respondents (25%). In the study area there was scarcity of water and the water sources were located far away. Further the process of making vermicompost was perceived complicated and costly by 25 per cent respondents. Few respondent (5 – 10%) reported that it is time consuming, requires too much care and maintenance and there are chances of bed getting damaged by dogs and cats.

CONCLUSION

Inspite of some problems, vermiculture technology was adopted to a good extent. However efforts are required in order to overcome these problems which will result in higher adoption. Wide publicity must be given to vermiculture technology through exhibitions, kisan melas, campaigns and mass media. There is a need to equip the farmers with detailed knowledge about vermiculture through trainings and guidance and convince them through result demonstrations and arranging group discussions. Extension efforts should be directed to increase the adoption of vermicompost among farmers. Field visits of the organic farming areas will motivate farmers to a great extent for its immediate adoption. Pilot projects on vermicomposting should be undertaken near the Krishi mandi, hotels, localities for utilizations of organic waste from such places.

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Sustainability of Scientific Maize Cultivation Practices in Bihar

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Abstract

Sustainability of scientific maize cultivation practices must be ensured to attain the goal of agricultural sustainability. The study was conducted in purposively selected state i.e. Bihar. A total sample size of 80 maize farmer respondents and 20 SMS/ Experts were selected by using multi-stage random sampling technique and simple random selection procedure respectively. Data were collected by using personal interview method. The collected data were tabulated, analyzed and interpreted with the help of appropriate statistical tools. Among the practices studied in scientific maize cultivation, mean sustainability scores obtained from farmer respondents was highest for irrigation followed by application of FYM, use of HYV and application of synthetic nitrogenous fertilizer respectively. The experts perceived significantly higher sustainability in all practices.

Estimates indicate that Indian population will require 325 million tonnes of foodgrain by 2020 AD. This demands consistent increase in production and productivity of agricultural crops. Maize has immense potential to meet food requirement of human population. It has a great significance as human food, animal feed and diversified uses in a large number of industrial products. Adoption of improved and sustainable maize technologies holds the key to ensure both sustainability and increased maize production. Muthuran (1995) cited 14 major dimensions of sustainable agriculture as identified by M.S. Swaminathan and according to him, sustainable agricultural technology should be technologically appropriate, economically feasible and viable, environmentally sound, stable over the long run, efficient in resource use, locally adaptable, socially acceptable and sustainable, implementable in existing political set-up and bureaucratic structure, culturally desirable, renewable, equitable and productive.

There is report of sustainability concerns and emerging problems in Bihar. In Bihar, farmers find it difficult to sustain their living standards due to small holding, less infrastructural facility, etc. Maize "The queen of cereals" is the third most important food crop in Bihar next only to rice and wheat. Kharif maize is an important crop. Concept of cultivating the "rabi maize" was originated in this state and it is grown in a sizeable area. Bihar account for 8.33% of the total maize area and 9.65% of total maize production in the country with an average yield of 23.74 q/ha during 2003-04. Sustainability of scientific maize cultivation practices in Bihar had not been studied, so far. Thus, keeping in view, the importance of scientific maize cultivation practices and decreasing trend of production and productivity, the present study was undertaken, with the specific objectives given as below:

1. To measure and compare the degree of sustainability of scientific maize cultivation practices in Bihar.

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2. To ascertain the perceptual difference, if any, among SMS / experts and farmers regarding various dimensions of sustainability with respect to scientific maize cultivation practices.

METHODOLOGY

The study was conducted in two progressive districts of Bihar Patna and Begusarai (purposively selected). Two blocks from each selected district; and from each block, two villages; and from each village, 10 farmers were selected by using multi-stage random sampling technique, thereby constituting a sample-size of 80 farmer respondents. Those farmers growing maize were considered as respondents. Twenty SMS/ experts working in the study area were also selected using simple random selection procedure. Technologies recommended by scientists of particular region become scientific practice, when it is in regular use by farmers. Based on review of literature and experts' advice four important scientific maize cultivation practices, namely; use of high yielding varieties(HYV), application of farm yard manure(FYM), application of synthetic nitrogenous fertilizer and irrigation were selected.

Degree of sustainability of selected scientific maize cultivation practices was operationalized as the perceived extent up to which selected practices were technologically appropriate, economically viable, environmentally sound, socio-culturally compatible, stable over long period of time, efficient in resource use, productive, locally adaptable, equitable and government policy in favour of its implementation. A suitable sustainability index was developed to measure extent of sustainability of selected practices. Index was developed by using ten dimensions and twenty-two indicators of sustainability. Responses were taken from both farmers as well as expert respondents on three-point continuum, i.e., agree, undecided and not agree. Score two (2) for agree, one (1) for undecided and zero (0) for not agree were given. Total obtained score for each selected practice was calculated. It was divided by number of respondents, which gave mean sustainability score. Dimension-wise mean sustainability scores were also calculated. For a total of ten dimensions of sustainability, the maximum possible mean score of sustainability were 44 for each of four scientific maize cultivation practices considered under the present study. Mean sustainability scores were calculated for each selected practice against all ten dimensions and twenty-two indicators and were analyzed by using 'Z' test.

RESULTS AND DISCUSSION

Among the practices studied, mean sustainability scores obtained from farmer respondents was highest in irrigation, followed by application of FYM, use of HYV and application of synthetic nitrogenous fertilizer, respectively(Table 1). The sustainability of all the selected practices was found to be perceived differentially by SMS / experts and the farmers. The experts reported higher sustainability of all practices. Mean sustainability scores obtained from experts respondents were highest in application of FYM followed by irrigation, use of HYV and application of synthetic nitrogenous fertilizer respectively. Both farmer and experts were of the opinion that application of synthetic nitrogenous fertilizer was least sustainable among selected practices. Difference in opinion of farmers and experts was mainly due to difference in educational background coupled with their respective professional interests: experts are the technology generators/ disseminators; whereas farmers are the actual users of technology.

1. Sustainability of use of high yielding varieties(HYVs)

Dimension-wise analysis (Table 2) of sustainability indicates that use of HYVs was more socio-culturally compatible, technologically appropriate, stable, efficient in resource use and productive, but government support is insufficient (e.g., non-availability of quality seed at cheaper price on right

time from government agency or Beej Nigam) and less economically viable.

Table 1. Sustainability of scientific maize cultivation practices in Bihar

Respon-dents	Mean Sustainability Score of Practices			
	Use of HYV	Application of FYM	Application synthetic nitrogenous fertilizer	Irrigation
Farmers (N=80)	30.44	31.65	26.49	32.26
Experts (N=20)	31.80	34.50	28.10	33.60
Z-value	2.13*	7.87**	3.07**	2.65**

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

Sustainability scores obtained from experts were found to be higher in most of the dimensions except socio-cultural compatability, stability and local adaptability. Few experts were of the opinion that HYVs are not suited to needs and aspirations of few sections of the farming community.

Results of dimension-wise sustainability analysis of selected scientific practices of maize cultivation have been presented below:

2. Sustainability of application of Farm Yard Manure (FYM)

FYM maintains physical structure of soil. Farmers were applying FYM as per its availability. Table 3 reveals that application of FYM in maize cultivation was found more environmentally sound, stable, socio-culturally compatible, productive, technologically appropriate but less equitable, locally adaptable and economically viable.

Farmer and expert respondents were widely varying in their responses regarding government policy. Farmers were expecting more government support in increasing availability of FYM. But experts opined that government has very limited role in increasing availability of FYM. Government is supporting application of FYM through various training programmes on integrated nutrient management (INM). Farmers should adopt improved method of composting like NADEP method, which increases amount of manure from same amount of dung.

Table 2. Dimension-wise sustainability of use of HYVs

S. No.	Dimensions of Sustainability	Maximum possible sustainability score	Bihar	
			Farmers(N=80)	Experts (N=20)
-				
1.	Technological appropriability	6	5.65	5.70
2.	Economic viability	6	3.12	4.00
3.	Environmental soundness	4	2.39	2.50
4.	Socio-cultural compatibility	4	3.93	3.80
5.	Stability	4	3.23	3.20
6.	Resource-use-efficiency	4	3.11	3.40
7.	Productivity	4	3.05	3.10
8.	Local adaptability	4	2.53	2.50
9.	Equity	4	2.46	2.50
10.	Government policy	4	0.98	1.10
	Overall	44	30.44	31.80

Researches should be conducted for rapid decomposition of dung, prevention of loss of nutrients in decomposition process, etc.

3. Sustainability of application of synthetic nitrogenous fertilizer

Dimension-wise analysis presented in Table 4 showed that application of synthetic nitrogenous fertilizer in maize cultivation was more socio-culturally compatible, technologically appropriate, productive and economically viable, but less environmentally sound and equitable. Farmers were using fertilizer without soil test. They were applying higher dose of urea for getting same yield level. Indiscriminate use of fertilizer making this practice less environmentally sound. Differences in the opinions of farmers and expert respondents were mainly on utilization efficiency of urea, risk involved

Table 3 Dimension-wise sustainability of application of FYM

S. No.	Dimensions of Sustainability	Maximum possible sustainability score	Bihar	
			Farmers(N=80)	Experts (N=20)
1.	Technological appropriability	6	5.16	5.30
2.	Economic viability	6	3.60	3.70
3.	Environmental soundness	4	3.96	4.00
4.	Socio-cultural compatibility	4	3.82	3.80
5.	Stability	4	4.00	4.00
6.	Resource-use-efficiency	4	3.09	3.30
7.	Productivity	4	3.65	3.70
8.	Local adaptability	4	2.11	2.00
9.	Equity	4	1.63	1.90
10.	Government policy	4	0.63	2.80
	Overall	44	31.65	34.50

Table 4 Dimension-wise sustainability of application of synthetic nitrogenous fertilizer

S. No.	Dimensions of Sustainability	Maximum possible sustainability score	Bihar	
			Farmers(N=80)	Experts (N=20)
1.	Technological appropriability	6	5.40	5.50
2.	Economic viability	6	4.42	4.40
3.	Environmental soundness	4	0.53	0.40
4.	Socio-cultural compatibility	4	4.00	4.00
5.	Stability	4	1.74	2.10
6.	Resource-use-efficiency	4	2.00	2.20
7.	Productivity	4	2.70	2.80
8.	Local adaptability	4	2.12	2.00
9.	Equity	4	1.44	2.20
10.	Government policy	4	2.14	2.50
	Overall	44	26.49	28.10

Table 5 Dimension-wise sustainability of irrigation

S. No.	Dimensions of Sustainability	Maximum possible sustainability score	Bihar	
			Farmers(N=80)	Experts (N=20)
1.	Technological appropriability	6	4.96	5.20
2.	Economic viability	6	3.81	4.00
3.	Environmental soundness	4	2.95	3.10
4.	Socio-cultural compatibility	4	4.00	4.00
5.	Stability	4	3.96	4.00
6.	Resource-use-efficiency	4	2.56	2.70
7.	Productivity	4	3.09	3.10
8.	Local adaptability	4	2.74	2.80
9.	Equity	4	2.00	2.40
10.	Government policy	4	2.19	2.30
	Overall	44	32.26	33.60

in imbalanced use of synthetic nitrogenous fertilizer, accessibility of urea and technical assistance to all farmers.

4. Sustainability of irrigation

Generally, kharif maize cultivation is rainfed but rabi maize is irrigated. Dimension-wise analysis (Table 5) indicated that irrigation in maize cultivation satisfies most of the dimensions of sustainability. It was found more socio-culturally compatible, stable and technologically appropriate. It was found to be less equitable. It indicates that irrigation facility is not available to all farmers. Both farmer and expert respondents stated regarding lack of government support for establishing irrigation infrastructure, like, canal irrigation, electricity operated pump-sets, etc. It is suggested that irrigation at critical stages of crop growth must be ensured in all seasons for getting higher yield and improving sustainability of irrigation as well as overall maize cultivation.

CONCLUSION

Among the practices studied in scientific maize cultivation, mean sustainability scores was highest in irrigation, followed by application of FYM, use of HYV and application of synthetic nitrogenous fertilizer, respectively, whereas, mean sustainability scores obtained from expert respondents was highest in application of FYM, followed by irrigation, use of HYVs and application of synthetic nitrogenous fertilizer respectively. The sustainability of all the selected practices was found to be perceived differentially by SMS / experts and the farmers. The experts reported higher sustainability of practices. Timely availability of quality seed, use of vermicompost, reduction in cost of irrigation and govt. control on supply, quality and cost of fertilizer were the important suggestions as given by the farmers to improve sustainability regarding use of HYV, FYM, irrigation and synthetic nitrogenous fertilizer, respectively.

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A Study on Extent of Adoption of Improved Practices of Guava

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Abstract

The study aims at analyzing the level of knowledge and the extent of adoption of improved cultivation practices of Guava and major constraints in its production in Western Uttar Pradesh. The study revealed that the fruit growers possessed higher level of knowledge on varieties, planting time, distance and density, irrigation time, method of application of fertilizers, harvesting, packing, handling and marketing practices. They possessed lesser knowledge on all other components. They were found to possess very low or poor knowledge on training and pruning practices and summer ploughing.

Horticulture is an important segment of the agriculture sector. Rapidly growing demand for horticulture commodities and products, especially burgeoning market for processed fruits and vegetables as well as booming floriculture market is an evidence of the phenomenon that is expected to further accelerate horticulture growth in the country. Consequently, horticulture is set to assume a greater role and importance within agriculture sector and eventually in the national economy (Mishra, 2007).

In addition, the economic prosperity brought about by diversification of land use for raising orchards for commercial fruit production has resulted in marked changes in farm incomes, life styles and consumption habits of our people.

The outstanding features of agricultural production in India are the wide variety of crops and preponderance of food over non-food crops. Food grain production in India reached an all time high in 2006-07. It increased from 50.82 million tonnes in 1950-51 to 220.0 million tonnes in 2006-07. It is however, mainly cereals which have contributed to the increase in food production. Among cereals, again the maximum contribution has been made by wheat followed by rice. Over a period of 57 years from 1950-51 to 2006-07, the production of wheat increased from 6.5 to 75.53 million tonnes. During the same period, the production of rice has also increased from 20.6 to 92.8 million tonnes. Sugarcane has also recorded a very high production of 270.0 million tonnes in 2006-07, while pulses recorded a production of 15.15 million tonnes in 2006-07.

The present study entitled "A study of adoption of improved practices of fruit crops and their constraints in Western Uttar Pradesh" is an effort in this direction. The study aims at analysing the level knowledge and the extent of adoption of improved cultivation practices of guava and their major constraints to their production in western Uttar Pradesh with the following specific objectives:

1. To study the socio-economic and personal attributes of the fruit growers and their relation with knowledge and adoption.
2. To find out the technological, communicational behaviour and extent of adoption towards improved cultivation practices of fruit crops.

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METHODOLOGY

The study was conducted in the Purkhazi, Chartawal, Morna and Muzaffarnagar blocks of Muzaffarnagar district of Uttar Pradesh. The sample size was 200 comprising of 25 farmer respondents from eight villages selected through stratified random sampling method. Level of knowledge and extent of adoption of mango and guava improved production practices were the dependent variables. Among the independent variables, the socio-personal variables were: Age, Religion, Caste, Land size, Land under field crops, Land under orchards, Land use pattern, Education, Family type, Family size, Occupation, Farm power, Annual income, Social participation, Socio-economic status, Risk taking behaviour, Innovativeness, Economic aspiration, Scientific orientation, and Credit orientation. Two communication variables are included in the study: Extension contact, and Mass media exposure. Suitable scales were used to measure the variables and an interview schedule was prepared. The data was collected through personal interviews. Data thus collected was analysed using appropriate statistical techniques.

Major Findings

The mean age of respondents was 44 years and nearly 73 per cent of respondents were in the middle age group of 36-50 years. Seventy per cent of the respondents were Hindus. Nearly 62 per cent of them belonged other backward castes. With respect to their educational status, 52 per cent of them had passed intermediate and graduation. More than 80 per cent of them lived in joint families. Nearly 58 per cent of them had smaller families of up to 5 members.

With respect to land under orchards, the mean size of orchard was nearly 6.5 acres, while 81 per cent of them possessed orchard of sizes varying from 5 to 9 acres. But the mean size of land under field crops was 5.6 acres with nearly 72 per cent of them possessing field crop lands of sizes varying between 3 and 8 acres. The farmers, when categorized on land size, it was found that 43 per cent of them were small farmers and another 40 per cent were medium farmers. About 85 per cent of farmers were not having any secondary occupation and their main occupation was agriculture.

With respect to farm power possessed by farmers, 57 per cent of fruit growers did not own any bullocks, while 41 per cent had owned a single bullock. Nearly 80 per cent of them owned a tractor, while 56 per cent owned at least two tractor drawn implements. With regard to using farm implements 53 per cent of them had used 7 to 9 farm implements. Average annual income of fruit grower respondents was Rs.1.39 lakh, while 77 per cent of them had annual incomes ranging from Rs. 0.93 lakh to 1.86 lakhs. About 83 per cent of respondents had medium level of social participation, and two-thirds of them enjoyed a medium level of socio-economic status. Forty-eight per cent of the fruit growers were found to be taking moderate risks, while 28 per cent of them were found to be taking lower levels of risks. About 53 per cent of them were found to be possessing moderate levels of innovativeness. But with respect to their economic aspiration 44 per cent were having medium level of economic aspiration, while 32 per cent of them had lower levels of economic aspiration.

About 58 per cent of fruit growers possessed medium level of scientific orientation. About 52 per cent of them had moderate level of credit orientation.

Table 1: Frequency and percentage distribution of extent of adoption of improved fruit production practices by farmers

N=200

Category	Score	Frequency	%
Low (<Mean-SD)	1	55	27.5
Medium (Between Mean±SD)	2	106	53.0
High (>Mean+SD)	3	39	19.5
	Mean=45.48	SD=22.10	

With respect to communication variables, 46 per cent of respondents had moderate levels of extension contact, while 31 per cent had higher levels of extension contact. Seventy-six per cent of fruit growers had moderate levels of mass media exposure.

A cursory look at the results revealed that there are four sets of independent variables included in the study: socio-personal, socio-economic, socio-psychological and communication variables. Out of the eight socio-personal variables, age, caste and family type were not associated with the level of knowledge of improved guava production practices. But religion, education, family size, social participation and socio-economic status were significantly associated with extent of adoption of improved guava production practices.

Among the four socio-economic variables, land size, farm power, annual income was significantly associated with extent of adoption of guava production practices.

Among the six socio-psychological variables including level of knowledge of guava production technology, all of them were strongly associated with extent of adoption of improved guava production practices.

Among the two communication variables, only extent of contact was strongly and positively associated with extent of adoption of improved guava production technology.

Table 2: Correlation coefficients of Extent of Adoption of guava production practices

Independent variables	Correlation coefficients
Age	-0.045
Religion	0.209**
Caste	0.078
Land size	0.673**
Education	0.318**
Family type	-0.028
Family size	-0.146*
Social participation	0.166*
Secondary occupation	0.154*
Socio economic status	0.768**
Farm power	0.693**
Annual income	0.714**
Extension contact	0.007
Mass media exposure	0.038
Risk taking behaviour	0.707
Innovativeness	0.385**
Economic aspiration	0.287**
Scientific orientation	0.712**
Credit orientation	0.268**
Level of knowledge of guava production practices	0.789**

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

CONCLUSION

The study revealed that the fruit growers possessed higher level of knowledge on varieties, planting time, distance and density, irrigation time, method of application of fertilizers, harvesting, packing, handling and marketing practices. They possessed lesser knowledge on all other components. They were found to possess very low or poor knowledge on training and pruning practices and summer ploughing.

Among the correlates of level of knowledge of improved guava production technology, religion, education, land size, farm power, socio-economic status, annual income, risk taking behaviour, innovativeness, economic aspiration, scientific orientation and credit orientation were positively and significantly associated with level of knowledge of improved guava production technology. Thus, it may be recommended that the training and pruning practice and summer ploughing to be improved amongst the guava growers of the study area to in enhance their knowledge level regarding guava production technology.

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Effectiveness of Technological Adoption in Agriculture Through Self Help Groups in Uttar Pradesh

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Abstract

A poor extension service has been identified as one of the major bottleneck in agricultural growth. Productivity enhancement is directly related to increased adoption of new technology. A World bank aided Diversified Agriculture Support Project (DASP) was implemented in the identified 157 blocks of 32 districts of the U.P. with objective of increasing agriculture productivity and production through support of UP's diversified production system, encouragement to privatization in agriculture and improvement in rural infrastructure. The mission of the project was to utilize unlimited potential of the state through participatory approaches, empowerment of farmers, development of rural infrastructure to support agriculture & allied enterprises for sustainable development.17986 Self Help Groups (SHGs) were formed to promote diversification of agriculture and its marketing out of which 3785 SHGs were actively involved in the marketing of agricultural produce and they were termed as Active Marketing Farmers' Interest Groups. The study was conducted to assess the impact of SHGs on technology dissemination and its adoption on farmers' field. It was observed that 67 percent farmers are using seed treatment followed by soil treatment (58 percent). 57 percent farmers are using HYV and 47 percent of gross cropped area was covered under soil testing. Efforts should be made to form more number of Farmers Interest Groups.

Uttar Pradesh, with annual production of 41.8 million tons of food grains (22% of the Country's total production) from 17.48 million hectares of cultivated land, contributes significantly to the national food supply. The state has the potential not only to feed its teaming million but can also make considerable contribution in meeting the challenge of country's future food requirement, in addition to meeting the dynamic domestic and international market demand. The globalization of agricultural trade will bring to the fore access to markets, new opportunities for employment with income generation, productivity gains and increased flow of investments into sustainable agriculture and rural development.

Diversified Agriculture Support Project (DASP) was implemented in the identified 157 blocks of 32 districts of the State from 1998 to 2004 with objective of increasing agriculture productivity and production through support of UP's diversified production system, encouragement to privatization in agriculture and improvement in rural infrastructure. Under DASP, Self Help Groups were formed to promote diversification of agriculture and the marketing of agricultural produce. The present study has been conducted with following specific objectives:

1. To examine the level of technology adoption by non group farmers,
2. To examine the impact of SHGs formation on technology adoption.
3. To examine the impact on productivity on the field of group farmers.

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4. To suggest suitable measures to enhance technology dissemination.

METHODOLOGY

There are four economic zones in Uttar Pradesh viz. Eastern, Western, Central and Bundelkhand. Two DASP districts from each economic zone were selected randomly for data collection. Thus, total eight DASP districts viz Kushinagar and Varanasi from Eastern zone, Meerut and Muzaffarnagar from Western zone, Lucknow and Farrukhabad from Central Zone, Jhansi and Jalaun from Bundelkhand zone were randomly selected for the purpose of the study. One hundred fifty Active Marketing Farmers' Interest Groups from above eight districts were selected randomly and data were collected from the SHGs and Non SHGs members to asses the impact. A simple tabular analysis was carried out to compute the averages and percentages to observe the effect of SHGs formation on technology dissemination, adoption and marketing of produce.

RESULTS AND DISCUSSION

The information about different categories of farmers is given in table-1. In Uttar Pradesh more than 90 percent farmers are in the category of small and marginal and the average size of holding is 0.86 ha. These two crores holdings are spread over more than 8000 Nyay Panchayats. There are only 5000 Kishan sahayaks are working as extension worker. On an average one extension worker has to cover about 4000 holdings. Therefore, dissemination of technology with limited human resources is not an easy task in the state.

Impact of Group Approach on technology dissemination and its adoption:

As more focus was given on soil testing under Integrated Plant Nutrient Management practices (IPNM) especially to the SHGs. The impressive result was found in the adoption of soil testing technology. Table-2 and Figure 1 show that around 72 percent sample farmers from SHGs have adopted the technique of soil testing with a view to know the nutrient requirement of soil before sowing of the crops. About 47 percent of gross cropped area was covered by soil testing technique which is a major breakthrough. The practice of soil testing technique was applied mainly for the purpose to apply the recommended dozes of fertilizer in their field. However, in case of Non SHGs only 19 percent farmers adopted this technique in 14 percent cropped area.

Table -3 and figure 2 indicate the adoption of improved farming practices such as soil treatment , seed treatment, no use of banned pesticides, seed production, application of zero tillage and use of HYV. Table-3 clearly depicts that the adoption of these practices was much higher among SHGs members as compared to Non-SHGs members. About 67 percent SHGs members adopted seed treatment followed by soil treatment (58 percent) and use of HYV (57 percent) as compared to 21, 12 and

Table 1: Size of Farm Holdings in Uttar Pradesh (1995-96)

Category	Area ('000ha)	Number ('000)	Average Holding size(ha)
Marginal (<1 ha)	6,033 (34%)	15,573 (75.6%)	0.4
Small (1-2 ha)	4,214 (24%)	2,983 (14.5%)	1.4
Medium (2-10 ha)	6,901 (39%)	2,009 (09.7%)	3.5
Large (>10 ha)	562 (3%)	38 (0.2%)	15.0
Total	17,710 (100%)	20,603 (100%)	0.86

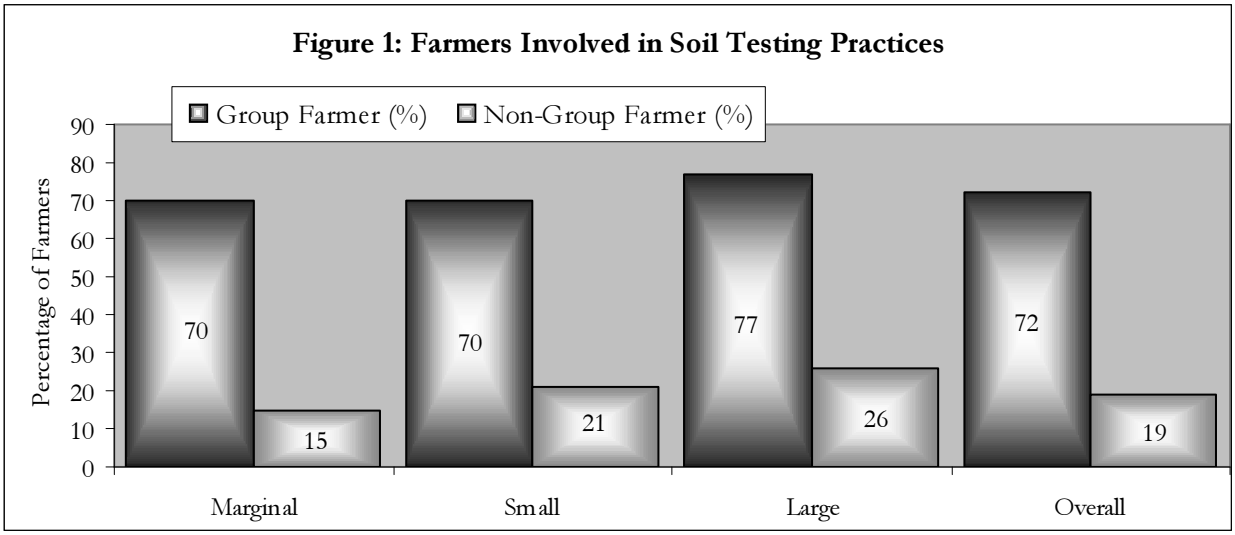
Figures in parentheses show the percentage of total in the respective column.
Source: Statistical Bulletin of Uttar Pradesh 2005.

Table 2: Adoption of Soil Testing Technology

Land holding	SHGs			Non-SHGs		
	Total growers	Farmers involved in soil testing	Soil testing area (ha)	Total growers	Farmers involved in soil testing	Soil testing area (ha)
Marginal	852	594 (70)	408.1 (39)	693	105 (15)	57.6 (9)
Small	456	318 (70)	477.6 (42)	255	54 (21)	73.6 (13)
Large	559	429 (77)	1821.4 (50)	261	67 (26)	256.9 (18)
Overall	1867	1341 (72)	2707.0 (47)	1209	226 (19)	388.1 (14)

Figures in parentheses are percentages of total
Source: DASP Evaluation Report 2004.

Figure 1: Farmers Involved in Soil Testing Practices



30 percent, respectively in Non SHGs farmers. Therefore, it was concluded that technology dissemination and its adoption is very effective through group approach.

Organic manure

Use of different type of organic manure was promoted in this project. The emphasis was given not only on adoption but also on preparation of organic manure, so that the demand of organic manure can be fulfilled by increased supply of quality organic manure. As a result there was tremendous increase in the adoption of organic manure among group members.As it is revealed from Table-4 and Figure -3 more than half of the sample group members were using NADEP, followed by application of vermi and CPP, where about 30 percent of group members were using the same. Use of organic manure has helped the farmers by increasing the soil health and quality of produce, reducing the cost of cultivation due to low use of costly chemical fertilizer etc. Under the project, though it was introduced to group members only but the spread over effect of this technology was clearly visible even among non-group members where 3 to 11 percent of farmers were also using organic manure in different crops.

Bio-Control

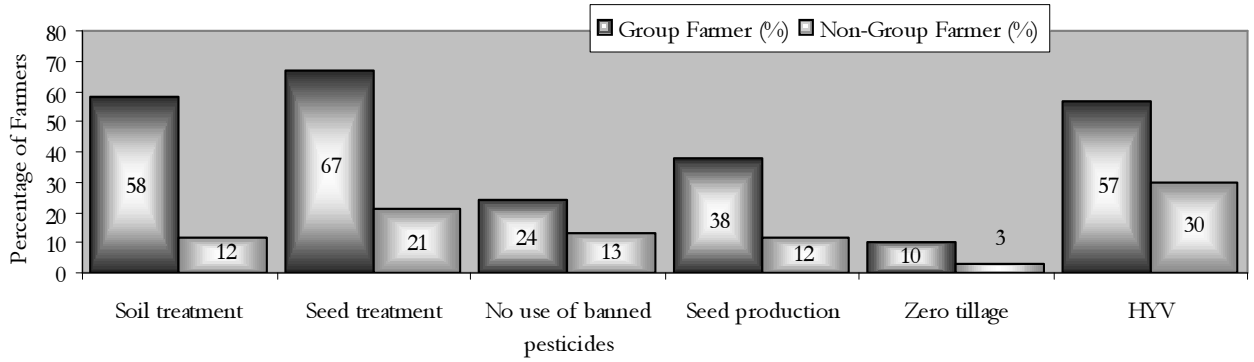
Department of Agriculture and Department of horticulture introduced the concept of Integrated Pest Management (IPM) under the project. The use of

Table 3: Adoption of important improved farming practices

Activities	Group			Non-group		
	Awareness	Adoption	Adoption (%) against awareness	Awareness	Adoption	Adoption (%) against awareness
Total farmers		1867			1209	
Soil treatment	1536 (82)	1079 (58)	70.2	561 (46)	144 (12)	25.7
Seed treatment	1624 (87)	1252 (67)	77.1	636 (53)	249 (21)	39.2
No use of banned pesticides	1061 (57)	451 (24)	42.5	431 (36)	153 (13)	35.5
Seed production	1296 (69)	711 (38)	54.9	440 (36)	143 (12)	32.5
Zero tillage	686 (37)	195 (10)	28.4	197 (16)	30 (3)	15.2
HYV	1431 (77)	1063 (57)	74.3	616 (51)	368 (30)	59.7

Figures in parentheses are percentages of total
Source: DASP Evaluation Report 2004.

Figure 2: Adoption of Improved Farming Practices



bio-control is not only cost effective but it also helps to reduce the environmental degradation and soil pollution by excessive use of chemical pesticides. During the period, it was observed (table-5 and figure-4) that about one-fourth of group members were using neem oil/cake as major bio-control agent against attack of different pests in their crop. The sharp differences in the adoption level among group and non-group members clearly reveal the impact of technology dissemination in the area.

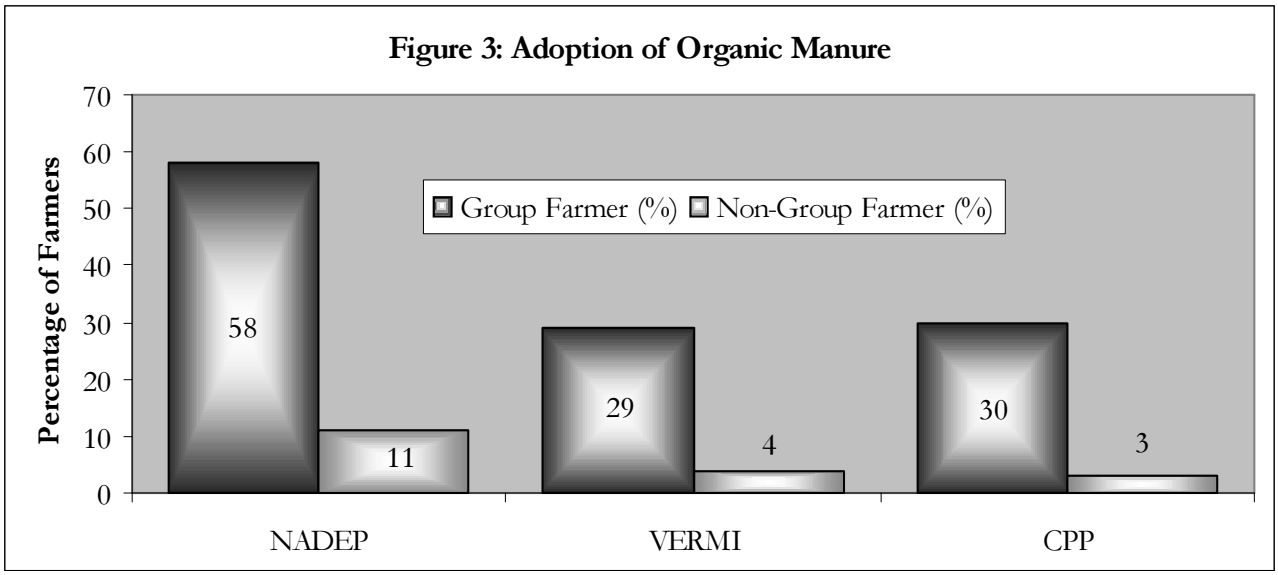
Impact of Technological Adoption on Crop Yield

Comparison of crop yield was done on the basis of monitoring and evaluation done by Agriculture Management Centre, Indian Institute of Management Lucknow. Five major agronomic crops viz. paddy, wheat, maize mustard, arhar and five horticultural crops viz. potato, onion, brinjal, green pea green chilies were selected to compare yield among the project and non project farmers. Monitoring agency also collected base line data for the year 1988-89 to compare the productivity enhancement due to technological adoption. It was observed that yield was increased in those areas where project intervention was not made, which may be due to either spread effect or effect of other intervention done by ongoing governmental /extension efforts. Therefore, absolute difference was calculated to find

Table 4: Adoption of Organic Manure

Organic manure	Group			Non-group		
	Awareness	Adoption	Adoption (%) against awareness	Awareness	Adoption	Adoption (%) against awareness
Total farmers	1867		1209			
NADEP	1537 (82)	1079 (58)	70.2	536 (29)	129 (11)	24.1
VERMI	897 (48)	537 (29)	59.9	210 (11)	45 (4)	21.4
CPP	902 (48)	553 (30)	61.3	162 (9)	39 (3)	24.1
BGA	117 (6)	76 (4)	65.0	12 (1)	1 (0.1)	8.3
CHM	62 (3)	12 (1)	19.4	3 (0.2)	1 (0.1)	33.3

Figure in parentheses are percentages (%)
Source: Report of DASP Evaluation by IIM Lucknow (2004)



out the real change due to this group based intervention.

A perusal of table 6 and 7 indicated that in wheat and mustard absolute change in yield was 10 percent, it was highest (16.7%) in arhar crop followed by maize (13.3%). In horticultural crops better productivity enhancement was observed compared to cereal and oilseed crop. The increase in potato and onion yield over base period was to the tune of 54.8 percent and 84.3 percent respectively. It indicates that there exists possibility of increasing productivity through better management and technological adoption.

CONCLUSION

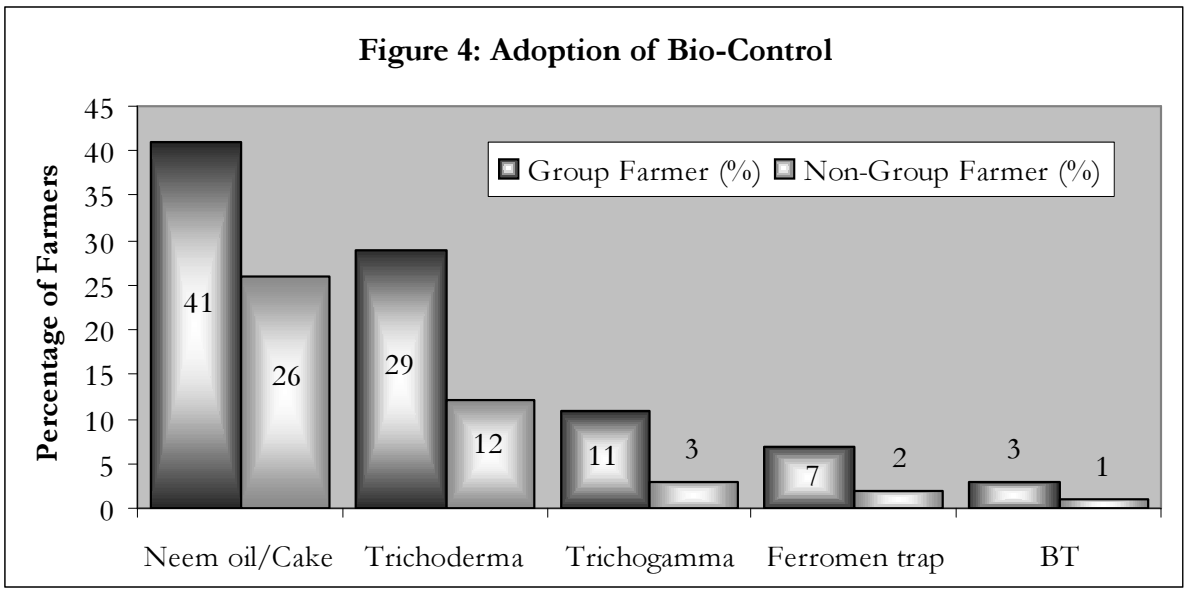
Dissemination of technology with limited human resources is not an easy task in the state. Department of Horticulture has no extension worker at Block or Nayay Panchayt level. Therefore growth in diversification of agriculture towards high value horticultural crops is very slow. Farmers were not using balance dose of fertilizer. In the state the N:P:K ratio is 27:8:1 in 2001 against the recommended dose

Table 5: Adoption of bio control

Bio-control	Group			Non-group		
	Awareness	Adoption	Adoption (%) against awareness	Awareness	Adoption	Adoption (%) against awareness
Total farmers	1867		1209			
Neem oil/Cake	1238 (40)	777 (41)	62.8	385 (13)	101 (26)	26.2
Trichoderma	810 (26)	549 (29)	67.8	157 (5)	47 (12)	29.9
Trichogamma	342 (11)	212 (11)	62.0	57 (2)	13 (3)	22.8
Ferromen trap	213 (7)	128 (7)	60.1	17 (1)	8 (2)	47.1
BT	63 (2)	40 (2)	63.5	4 (0.1)	3 (1)	75.0

Figure in parentheses are percentages (%)
Source: Report of DASP Evaluation by IIM Lucknow (2004)

Figure 4: Adoption of Bio-Control



of 6:4:1. There is ample scope of creating awareness for soil testing among farmers. Also a great scope was found for increasing awareness for seed treatment and seed replacement i.e. adoption of High Yielding Variety (HYV). Seed treatment and use of HYV is a large impact on productivity increase. Among the various organic manure NADFEP, Vermicompost and Cow Pat Pit (CPP) were found more adoptable by farmers .Application of these organic manure has helped the farmers in increasing the soil health and quality of produce, reducing the cost of cultivation due to low use of costly chemical fertilizer etc. Neem oil/cake and Trichoderma among various bio control measures were found to be the most effective and adoptive. As a productivity of wheat, paddy and potato increased by 10 percent, 27 percent and 59 percent, respectively. Productivity of most of the vegetables crops has increased by 15 to 50 percent. Marketing infrastructure is under government control and essentially organized around cereal crops and pulses and it does not cater very well to the perishable and non-traditional products

Table 6: Impact on yield of Agronomic Crops (yield in qtls/ha)

Indicators	Baseline (1998-99)	Final impact (2002-03)		% change over baseline		Project's impact (absolute change)
		Project	Non-project	Project	Non-project	
Paddy	22	28	26	27.3	18.2	9.1
Wheat	30	33	30	10.0	0.0	10.0
Maize	15	20	18	33.3	20.0	13.3
Mustard	10	11	10	10.0	0.0	10.0
Arhar	12	14	12	16.7	0.0	16.7

Source: Report of DASP Evaluation by IIM Lucknow (2004)

Table7: Impact on yield of horticultural crops (yield in qtls/ha)

Indicators	Baseline (1998-99)	Final impact (2002-03)		% change over baseline		Project's impact (absolute change)
		Project	Non-project	Project	Non-project	
Potato	168	260	248	54.8	47.6	7.1
Onion	102	188	177	84.3	73.5	10.8
Brinjal	203	255	238	25.6	17.2	8.4
Green Pea	50	73	60	46.0	20.0	26.0
Green Chilli	74	85	70	14.9	-5.4	20.3

Source: Report of DASP Evaluation by IIM Lucknow (2004)

which hold huge scope for both income and employment generation. Advice on post-harvest technology and management activities is not readily available and there are few backward and forward linkages with agribusiness sector. There is lack of updated market information about the prices of important products in the major markets to facilitate farmers in making crop planning. Efforts are being made to form Self Help Groups, but follow up and sustainability of groups are very poor.

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Constraints in Joint Forest Management (JFM): An Experience of Kumaun in Uttarakhand (India)

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Abstract

The JFM project has been implemented in Uttarakhand state since early years of the decade to rejuvenate degraded forests with active involvement of local population and state Forest Department. An in-depth study was carried out in two JFM villages representing hill and Tarai regions of Kumaun. The study brought out the constraints like lack of cooperation among villagers, poor cooperation from forest officials, illegal grazing, damaging boundary wall, fire burning, illegal cutting of fuel wood and timber, conflict among VFC members, lack of training intervention and poor follow up by forest department as major hurdles perceived by VFC members. Moreover, the beneficiaries of JFM project experienced problems in collection of fuel wood and fodder, difficulty in grazing, favouritism in providing employment opportunities through project activities and distribution of forest products. The concerned forest officials have been perceived the constraints like factions among village communities, poverty, wide gap in socio-economic status, lack of interest among villagers, inadequate training on JFM, lack of staff, lack of rapport with villagers and ignorance about participatory methodologies were other major hurdles in achieving success through JFM.

Uttarakhand is predominantly a forest rich state covering it's about two-third area under various kinds of forests. Despite legal restrictions and efforts of the forest department for several decades through various projects, not much success could be achieved in rejuvenating degraded forests. During later years of the twentieth century, the state Government has realized and adopted JFM as a policy shift in forest management in pursuance of the 1990 notification of Central Government.

The philosophy of JFM is to involve the local people in resource generation activities through active involvement in the process of management and sharing of benefits through suitable institutional arrangements. Keeping this in view, the present study was conceptualized to find out the major constraints perceived by various stakeholders during implementation of the project. The findings of the study will help the planners and implementers in their future course of action.

METHODOLOGY

The present study was conducted in *Kumaun* region of Uttarakhand. Since the study focuses on Joint Forest Management project, the forest management units were considered as the basis of sampling. The whole state is divided in 35 forest divisions for managing and governing rich forest resources of Uttarakhand. Out of 35 forest divisions, two forest divisions namely *Haldwani* and *Tarai* central were purposely selected for the study. In next stage of sampling, from *Haldwani* forest division, a village

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Gumal Gaon which represent hill region of Uttarakhand and from *Tarai* central forest division, *Jai Nagar* was selected for the study as representative of *Tarai* villages. The JFM project was completed four years in selected villages at the time of investigation. Moreover, the sampled villages were having maximum area under JFM in their respective forest divisions. The present investigation is confined only to two villages because it involves intensive observations, in-depth interviews, focused group discussions, individual interviews and informal interactions with all stakeholders viz; beneficiaries of the project, members of village forest committees (VFCs) and concerned forest officials.

The number of households in selected villages were 37 (hill village) and 486 (*Tarai* village) as documented in micro plan of the village prepared for implementation of JFM. However, at the time of investigation only 33 and 454 households were residing in hill and *Tarai* village, respectively. Out of the residing households, hundred percent households from hill village and fifty percent households from *Tarai* village were considered for the study. The sampling of households in *Tarai* village was done by dividing entire population in odd/even numbers. All the households listed on even numbers got selected as sample for the study. Thus, a total of 260 households constituted sample for the study.

Among selected households, head of the households were interviewed with the help of an interview schedule constructed in consultation with beneficiaries, VFC members and forest officials. The interview schedule was pre-tested on 26 respondents (10 percent of the sample) chosen from a JFM village other than sampled villages. In addition to this, several rounds of in-depth interviews with VFC members, key informants (opinion leaders), focused group discussions among beneficiaries and individual interviews of concerned forest officials were also conducted to document their responses on the issue. Triangulation method was used to crosscheck the data collected through various methods.

RESULTS AND DISCUSSION

An attempt was made to find out constraints perceived by VFC members and forest officials in implementation of the JFM project. The ultimate beneficiaries of the project were also inquired about the constraints perceived by them in implementation of Joint Forest Management project in their village. The constraints and suggestions given by various stakeholders during the investigation have been discussed hereunder:

Constraints perceived by Village Forest Committees (VFCs)

1. Lack of co-operation among villagers

Lack of co-operation from the villagers with VFC members was considered as one of the major constraints, which affect smooth functioning of the project in both the villages. The village *Pradhan* was elected as president of VFCs in both the villages. People who were against the *Pradhan* were creating problems and showing non-co-operation with them. Caste and class differences also inhibited people to co-operate with each other in the project activities.

2. Poor co-operation from Forest Department

VFC members blamed concerned forest officials like DFOs, SDOs, Rangers, Foresters and Forest Guards for their laziness and low co-operation to the VFC. They often created problems in releasing the fund in due time. VFC members complained that forest officials themselves planted the *Poplar* trees in plots under JFM area instead of giving this responsibility to VFC members. The forest officials did not provide any cash money to the VFC from final harvest (timber) from JFM plots, which was mentioned in agreement of the project.

3. Illegal grazing in JFM area

It was also a serious problem found in both the villages. The villagers grazed their animals in JFM area and if stopped by the watchman they fought with him. Animal grazing in JFM caused severe damage to newly planted trees.

4. Braking boundary wall/fencing

Members of VFCs from both the villages complained that people of the village damaged boundary wall because of jealousy with VFC president. In *Tarai village*, the villagers had stolen the barbed wire put as a boundary for the JFM area and sold it.

5. No land to grow the fodder

The VFC members complained that forest officials had not given any land of JFM area to grow the fodder, which was incorporated in micro-plan of the village. Instead of it, they were giving land to the outsiders on lease for cultivation.

6. Fire burning in JFM area

People burned the fire in JFM area of hill village to damage the forest. The president of VFC filed a FIR (First Investigation Report) against many people in the village. The fire damaged a small patch of forest including newly planted trees. This incident was also due to personal jealousy and rivalry with the President of VFC.

7. Illegal cutting of the trees

The VFC members of both the villages complained that people of the village were cutting the trees from JFM area and sold them illegally.

8. Conflict among VFC members

The conflict among the members negatively affected functioning of the VFC. It was because the people who were not in favour of the President created problems in every activity of the project. It was also due to personal interest and background differences which created problems. This was observed in both the study villages.

9. Some VFC members mentioned that president did not inform them while planning project activities. Place for conducting meeting was not chosen and decided with consensus of VFC members. Most of the time these meetings were organized at *Pradhan's* residence.

10. Poor follow-up from Government side also reduced enthusiasm of people to work for the project.

11. Most of the villagers were not ready to work in JFM area on reduced wage because they were not interested in long-term benefits and liked to work only as daily labourers.

12. Encroachment by forest dwellers (*Van Gujjar*) in JFM area was also causing serious problems as perceived by VFC members in *Tarai* village.

Suggestions by VFCs

i. Ethics and zeal among forest officials are needed to be developed for developing JFM area for welfare and development of local population.

ii. The VFCs should be given legal rights with immediate effect to get effective results.

iii. Some legal provisions must be made under JFM for punishing people who damaged JFM area and misuse it.

iv The promises made in village micro-plan needed to be fulfilled by forest officials with immediate effect.

v There is need for organizing training and other capacity building activities for VFC members as well as forest officials by experts from the field of participatory management.

vi The JFM plots which had been given to the businessmen on lease should be handed over to the VFC with immediate effect.

vi VFC members felt that there should be some printed literature on JFM which could develop more understanding about the project.

Constraints perceived by beneficiaries

1. Problem in collection of fuel wood and fodder

Respondents from both the villages stated that they were having problem of collecting fuel wood from the forest near to the village. Before the start of JFM, women and children were collecting fuel wood and

fodder, but now the forest near to the village, covered under JFM and no one was allowed to go in the forest except VFC members. At present, women and children did not have any access to the forest resources like fuel and fodder.

2. Grazing problem

Incomplete fencing in JFM area was resulting in cattle of villages entering in JFM area. This created conflict with watchman and other VFC members. Few FIRs were also filed by VFC members against villagers.

3. Unequal distribution of fuel wood

The respondents from *Tarai* village complained that fuel wood was not distributed among the villagers who really required it. Instead, VFC members sold fuel wood illegally in the market. Villagers also complained that VFC members are real beneficiaries of the JFM project and common villages asked to pay money as contribution in Village Development Fund (VDF) without getting any benefit.

4. Favouritism in employment

Favouritism and partiality by VFC members in giving employment and other benefits through JFM was major barrier in success of the project. Favouritism by the members and president created tension and conflicts among the villagers.

Other constraints, which respondents felt in implementation of JFM, were: misuse of funds by VFC members, short-term livelihood needs vs. long-term ecological conservation problem, and increased gap among various communities in the village.

Suggestions by beneficiaries

i The forest officials must ensure equal opportunities for all villagers.

ii There must be regular supervision of performance of VFC by forest officials and village representatives from all sections of the village.

iii Monthly meetings of whole villagers should be called to review the work of VFC.

iv There must be provision of punishment for all type of corruption made by any one including VFC members and villagers.

v There must be full transparency in expenditure of fund and if someone wanted to see the record must be shown without creating any problem.

vi Problems among VFC members should be resolved mutually.

vii Land should be given to landless labourers to grow the fodder in JFM area.

Constraints perceived by forest officials

1. *Poverty in the village*

Most of the villagers were living below poverty line which resulted in their poor co-operation in the project because they were interested in short-term livelihood rather than long-term benefits through environmental sustenance. Moreover, they were daily wage labourers and not ready to work in JFM on lesser wages.

2. Lack of interest and time was another major constraints perceived in implementation of JFM. Rural men and women are always busy and not interested to come in meetings without any incentive.

3. Factions among villages had led to lack of co-operation from all the groups.

4. The villagers who were active and educated did not show much interest in JFM because they were self-centered.

5. Forest officials who were responsible for implementation of JFM were not provided any training in the field.

6. The people in JFM villages had other priorities for development viz. supply of drinking water, construction of road etc.

7. Forest officials did not have any rapport with the villagers which might be because of frequent transfer from one area to another area.

Suggestions by forest officials

i There is need to appoint additional staff for better implementation of JFM.

ii Present staff should be trained about philosophy, mechanism and participatory methodologies related to JFM.

iii Forest officials should be given more time to built rapport and creditability among the villagers.

iv The villagers should be given opportunity to priorities their needs.

v At initial stage of the project, small incentives viz. mini-kits of seeds, small packets of fertilizers etc. should be provided which might increase their participation to a great extent.

vi The democratic leadership should be developed among the villagers through VFCs for success of the project.

vii Participation of women should be encouraged by providing them proper exposure.

The constraints perceived by VFC members and forest officials in the study villages were in line with the findings of earlier researchers i.e. Kumar and Kaul (1996), De (1977), Mishra (1997) and Dhaubhadel (1998).

CONCLUSION

Lack of cooperation among villagers, poor cooperation from forest officials, illegal grazing, damaging boundary wall, fire burning, illegal cutting of fuel wood and timber, conflict among VFC members, lack of training intervention on technical aspects of JFM and poor follow up by forest department were major constraints perceived by VFC members in implementation of JFM. On the contrary, the beneficiaries of JFM project (common villagers) experienced problems in collection of fuel wood and fodder, difficulty in grazing and favouritism in providing employment opportunities through project activities and distribution of forest products.

The forest officials involved in implementation of JFM have perceived the constraints like factions among village community, poverty, wide gap in socio-economic status and lack of interest among villagers for such projects. They have also stated that inadequate training on JFM, lack of staff, lack of rapport with villagers and ignorance about participatory methodologies were other major hurdles in achieving success through JFM.

To overcome these constraints, there is need to work on capacity building of forest officials as well as VFC members regarding participatory methodologies, democratic leadership, interpersonal communication, conflict management and technical aspects of participatory management. Regular monitoring and follow up of project activities by senior officials will increase credibility among rural people which result in improvement in standard of the programme. Transparency in work, expenditure and sharing of benefits has utmost importance in success of JFM.

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Technology Assessment: A Ground Reality of Paddy in Uttar Pradesh

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Abstract

Paddy, the most important food crop of Uttar Pradesh, is grown in an area of 59.04 lakh ha with the productivity level of 19.77q/ha. Overall, 16 On-Farm-Trials (OFTs) were conducted at 15 KVKs on different aspects in the city during 2005-06. It was found that improved varieties registered yield gains of 8.56 q/ha. Cropping systems registered yield advantage of 4.35-12.15 q/ha with recommended doses of fertilizers i.e. N: P: K @ 120-150: 60-: 40 kg/ha, Zinc 25 kg/ha in deficient areas provided additional yield of .0.98–7.61 q/ha. The resource conservation technologies viz, use of zero till machine coupled with improved varieties, recommended doses of fertilizers and direct seeded rice with stale bed sowing attained yield advantage of 5.00- 13.60 q/ha. Weed management especially through herbicides application i.e. Pendimethaline @ 3.33 l/ha and Butachlore 50 EC @ 4l/ha provided additional yield of 6.80 q/ha. Organic sources as vermicompost @ 2.5 t/ha and inorganic fertilizer doses provided yield advantage of 2.50 q/ha. Thus, the study concludes that yield advantages can be attained by the use of improved varieties, integrated weed management and resource conservation technologies in farmers' conditions.

Paddy is the most important food crop in Uttar Pradesh. It is grown in Indo-Gangetic plains in paddy–wheat cropping system. The acreage under this system is about 11 million ha of which paddy is grown in an area of 59.04 lakh ha with the productivity level of 19.77q/ha. Therefore, the yield level is still very low at field level and hence, efforts are being made through Krishi Vigyan Kendras (KVKs) by conducting problem based on farm trials at farmers' fields. The ground reality is that farmers are still adopting local practices e.g. use of old varieties, imbalanced use of fertilizers, no use of resource conservation technologies, herbicides, insecticides and pesticides, etc. Farmers are not following and choosing timely or late planting varieties of paddy as per farming situation. Keeping these facts in view, on farm trials were conducted to assess the recommended technologies with farmer's involvement in the existing farming condition to maximize the production potential in varied situations.

METHODOLOGY

Overall 16 On Farm Trials (OFTs) were conducted at 15 KVKs on different aspects in Uttar Pradesh during 2005-06. Under paddy trials, different aspects considered were integrated nutrient management; weed management; resource conservation technologies; and integrated pest management at farmers' fields. Action plan of OFTs was prepared by individual KVK. The participatory approach was followed to identify the problems and their

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alternative interventions. Data were recorded with help of participating farmers. The purpose of these trials was to assess the recommended technologies with farmer's participation in the existing farming situations and standardize the production potential in varied situations.

RESULTS AND DISCUSSION

Response of Varieties

The hybrid varieties tested in district Sultanpur gave higher yields viz Pro - agro - 6444 (56.42 q/ha) followed by GK-5006 (49.30 q/ha) under medium duration & GK-6516 (48.75 q/ha) under long duration as compared to short duration varieties. The variety Proagro-6444 resulted additional yield of 8.30q/ha over short duration varieties. The varieties tested in district Allahabad have given higher yields viz Narendra -359 (49.28 q/ha) followed by Sarju-52 (43.84 q/ha) as compared to Pant Dhan -10 (prevailing cultivar). The variety Narendra -359 resulted additional yield of 18.56q/ha over Pant Dhan-10 varieties (Table 1).

Cropping System

In district Saharanpur, Pant Dhan 4667 sown with the proper plant population 40-50 plants / m^2 have given higher yield of 59.25 q/ha followed by plant population 30-40 plants / m^2 (51.45 q/ha) as compared to farmers practice (Table 2). The additional yield advantage ranges from 4.35 to 12.15 q/ha over farmers practice.

Table 1: Performance of high yielding paddy varieties

KVK	Problem identified	Intervention	Treatments	Production (q/ha)
Sultanpur	Use of old varieties	Evaluation of different hybrid varieties	T1: GK-6516 (Long duration)	48.75
			T2: H-6444 (Medium duration)	56.42
			T3: GK-5006 (Medium duration)	49.30
			T4: GK-6129 (Medium duration)	47.30
			T5: H-6606 (Medium duration)	42.74
			T6: RH-10 (Short duration)	41.80
			T7 K-7 (Short duration)	30.25
			T8: K-8 (Short duration)	42.32
Allahabad	Use of old varieties	Introduction of improved varieties	T_1- Traditional practice (Pant Dhan-10)	30.72
			T_2- Sarju -52	43.84
			T_3- Narendra-359	49.28

Table 2: Yield performance of paddy under cropping system

KVK	Problem identified	Intervention	Treatments	Production (q/ha)
Saharanpur	Improper plant population	Application of different plant geometry	T1- Farmers practice (25 plants/m^2)	47.10
			T2- 30-40 plants /m^2	51.45
			T3- 40-50 plants / m^2	59.28

Nutrient Management

In district Fatehpur, trials were conducted on Basmati variety with four replications. The farmers were using NPK @ 150:100:0 kg/ha which was taken as a check, resulted 31.20 q/ha. Basmati rice with recommended doses of NPK @ 120:60:40 kg/ha +Blue green algae @ 2 kg/ha resulted grain yield of 38.3 q/ha. The yield advantage was 7.10q/ha over farmers' practice.

In district Faizabad, trials on PBT-5204 variety with four replications was conducted. The farmers were using NP @ 200:20 kg/ha and getting yield of 46.15 q/ha, on which another treatment was taken with NPK @ 120::60 40 kg/ha resulted yield of 49.34 q/ha. Recommended doses of fertilizers + Azatobactor 2.5 kg/ha + PSB 3 kg/ha given the yield of 47.13 q/ha and NP K @ 120:60:40 kg/ha + Azatobactor 2.5 kg/ha + PSB 5.0 kg/ha was attained the yield of 50.06 q/ha. The yield advantage ranges from 0.98 - 3.90 q/ha over farmers' practice.

In district Ballia, a trial on Sarju -52 variety was conducted with four replications. The farmers were found using only NP @ 150:20 + Zn So_4 25 kg/ha with the yield of 41.30 q/ha. The treatment of giving NPK @ 120:60:60 kg/ha + Zn So_4 25 kg/ha, the yield was higher than the farmers' practice (53.91 q/ha). The recommended doses of fertilizer i.e. NPK @ 100:60:40 kg/ha + Zn So_4 25kg/ha and rest N applied based on leaf colour chart resulted the yield of 58.91 q/ha. The yield advantage was noted with treatment T3 as 17.61 q/ha followed by treatment T2 as 11.80 q/ha compared to farmers' practices (Table-3).

Response of Organic Source & Inorganic Fertilizers

In district Raebareli, the trial on NDR-359 variety with four replications was conducted. Farmers were not using vermicompost with the yield gain of 40.00 q/ha. The treatment NPK @ 120:60:40 kg/ha +vrmicompost 2 2.5 t/ha resulted yield level of 36.80 q/ha. Similarly, recommended doses of fertilizers coupled with half dose of vermicompost gave yield 42.50 q/ha which was almost equal to recommended doses of fertilizers.

The farmers of district Sultanpur, trials on NDR - 359 variety with four replications was conducted under paddy - wheat rotation with using imbalanced doses of fertilizers i.e. N: P: K @ 120:60:35 kg/ha and were harvested grain yield of 52.21 q/ha. In the trial, the response was shown with vermicompost @ 1.5 t/ha + fertilizers of NPK @ 60:30:17 kg/ha. The grain yield was recorded as 51.94q/ha. When the nitrogen 60 kg/ha + vermicompost @ 3 t/ha was applied, it resulted yield of 49.52 q/ha.

Impact of Resource Conservation Technologies

Trial on PBT- 5204 variety with three replications was organized at KVK, Maharajganj. Farmers were using NP @ 140:50 + $ZnSO_4$ 25 kg/ha and obtained 42.50 q/ha yield. The trials were conducted at farmers' fields with the use of zero till machine + NPK @ 120:60:60 kg/ha + Pendamethaline @ 3.25 l/ha as pre-emergence out of total nitrogen, 80% applied as basal and rest based on leaf colour chart with the yield of 41.70 q/ha. In another treatment, use of zero till machine + NPK @ 120:60:60 kg/ha out of total nitrogen 80% applied as basal and rest based on leaf colour chart + Pendamethaline @ 3.25 l/ha as pre-emergence with sesbenia brown green manuring by application of 2,4-D @ 1kg/ha as post emergence provided the yield of 47.50 q/ha. So, the grain yield advantage was obtained 5.00 q/ha over farmer's practice.

KVK, Basti laid out the trial on BPT- 5204 variety with three replications. Farmers were using NP @ 140:50 + $ZnSO_4$ 25kg/ha with the yield of 42.20 q/ha. The trials were conducted at farmers' fields with direct seeded rice with stale bed technique of zero till machine + NPK @ 120:60:60 kg/ha + Pendamethaline @ 3.25 l/ha as pre-emergence out of total nitrogen, 80% applied as basal and rest based on leaf colour chart with the yield of 43.70 q/ha. In another treatment, use of zero till machine + NPK

Table 3: Effect of nutrients on paddy yield in different districts

KVK	Problem identified	Intervention	Treatment	Production (q/ha)
Fatehpur	Imbalanced use of fertilizers	Balance use of fertilizer	T_1 Farmers practice NPK @150:0:100+Basmati Dhan	31.2
			T_2 – Basmati Dhan+NPK @ 100:60:40+BGA	35.8
			T_3 –Basmati Dhan+ NPK @120:60:40+BGA	38.3
Faizabad	Imbalanced use of Fertilizers	Balance fertilizer use with bio-agents	T_1- Farmers practice (NPK @200:20:0 kg/ha)	46.15
			T_2 – NPK @120:60:40 kg/ha	49.34
			T_3- T_1+Azotobactor @ 2.5+PSB @3.0 kg/ha	47.13
			T_4 - T_2+ Azotobactor @2.5+PSB @ 5.0 kg/ha	50.06
Raebareli	Imbalanced use of nutrients and no use of organic fertilizer	Use of NPK with vermicompost	T_1:Farmers practice (No vermicompost use)	32.00
			T_2:NPK @120:60:60kg/ha	40.00
			T_3:NPK @120:60:60 kg/ha+ vermicompost.@ 2.5 tonnes/ha	36.80
			T_4:NPK @120:60:60 kg/ha+ 50% Vermicompost	41.50
Ballia	Imbalanced use of fertilizer in paddy	Nitrogen management on the basis of Leaf Colour Chart in Paddy	T1-Farmers practice (NPK @150, 20, 0 + $ZnSO_4$ @ 15 kg /ha	41.30
			T2 – NPK @ 120, 60, 60 + $ZnSO_4$ 25 kg/ha	53.10
			T3- NPK @100, 60, 60 + $ZnSO_4$ 25 kg/ha + rest N based on Leaf Colour Chart (LCC)	58.91

@ 120:60:60 kg/ha out of total nitrogen 80% applied as basal and rest based on leaf colour chart + Pendimethaline @ 3.25 l/ha as pre-emergence with sesbania brown green manuring by application of 2,4-D @ 1kg/ha as post emergence provided the yield of 44.50 q/ha. So, the grain yield advantage was noted as 1.50 and 2.30 q/ha, respectively over farmer's practice.

KVK, Mau laid out the trial on NDR -359 variety with three replications. Farmers were using NP @ 140:50 + $ZnSO_4$ 25kg/ha with transplanting and obtained yield was 28.75 q/ha. The trials were conducted at farmers' fields with direct seeded rice with stale bed technique of zero till machine + NPK @ 120:60:60 kg/ha + Pendimethaline @ 3.25 l/ha as pre-emergence out of total nitrogen, 80% applied as basal and rest based on leaf colour chart with the yield of 29.20 q/ha.

Table 4: Effect of resource conservation technologies on paddy yield

KVK	Problem identified	Intervention	Treatment	Production (q/ha)
Maharajganj	High transplanting cost and loss nutrients	Direct Seeded Rice and nutrient management through Sesbania (B GM) & LCC	T1 – Use of NPK @140:50:0+ $Znso_4$ @ 25kg/ha	36.05
			T2 - Direct seeded rice with stale bed technique with Zero Till + Pendimethaline @3.25l/ha + NPK @120:60:60 kg/ha 80% N as basal, Rest by Leaf Colour Chart (LCC).	39.62
			T3 – T2 + sesbania brown green manuring + application of 2,4 –D @ 1.0kg/ha	44.72
Basti	Imbalance use of fertilizer	Assessment of Direct Seeded Rice under Stale Bed technique and nutrient management in rice	T_1- Farmers Practice - Transplanting, no green manuring and use of excess N	42.2
			T_2- Direct seeded rice with stale bed technique ZT machine + Pendimethaline @3.25l/ha + 80% N as basal rest N based on Leaf Colour Chart (LCC)	43.7
			T_3- T2 + B G.M of sesbania + application of 2,4 –D @ 1.0kg/ha	44.5
Mau	High input cost and poor health of soil	Use of zero till machine for DSR SB with Pendimethaline, 2,4–D & Sesbania (B GM)	T1- Farmer's practice, transplanting	28.75
			T2- Direct seeded rice with stale bed technique (ZT) + Pendimethaline @3.25l/ha + 50%N as basal & rest LCC based.	29.20
			T3- T2+ 50%N as basal & rest Leaf Colour Chart based + sesbania (B GM)+ application of 2,4- D @ 1.0kg/ha	30.50
Varanasi	High cost of production	Direct seeded rice with stale bed technique and nutrient management	T_1 Farmers practice, transplanting	51.60
			T_2 Direct seeded rice with stale bed technique + Pendimethaline @3.25l/ha + 80% N basal & rest N based on Leaf Colour Chart.	63.20
			$T_{3:}$ T_2 + Brown green manuring of sisbania + 2, 4-D @ 1.0kg/ha	64.00

In another treatment, use of zero till machine + NPK @ 120:60:60 kg/ha out of total nitrogen 80% applied as basal and rest based on leaf colour chart + Pendimethaline @ 3.25 l/ha as pre-emergence with sesbania brown green manuring by application of 2,4-D @ 1kg/ha as post emergence provided the yield of 30.50 q/ha. So, the grain yield advantage was noted as 0.4 and 1.75 q/ha, respectively over farmer's practice.

KVK, Varanasi laid out the trial on NDR-359 variety with three replications. Farmers were using NP @ 140:50 + Zn So_4 25kg/ha with the yield of 51.60 q/ha. The trials were conducted at farmers' fields with direct seeded rice with stale bed technique of zero till machine + NPK @ 120:60:60 kg/ha + Pendimethaline @ 3.25 l/ha as pre-emergence out of total nitrogen, 80% applied as basal and rest based on leaf colour chart with the yield of 63.20 q/ha. In other treatment use of zero till machine + NPK @ 120:60:60 kg/ha out of total nitrogen 80% applied as basal and rest based on leaf colour chart + Pendimethaline @ 3.25 l/ha as pre-emergence with sesbania brown green manuring by application of 2,4-D @ 1kg/ha as post emergence provided the yield of 64.00 q/ha. So, the grain yield advantage was achieved as 12.4 and 13.60 q/ha, respectively over farmer's practice

Effect of Weed Management

The trial was laid out in district Mau against the problem of weeds. The farmers were using variety Sarju- 52 + NP @ 150:40 kg/ha, without weedicide use and the yield was obtained as 33.00 q/ha. When another treatment variety Sarju- 52 with NPK @ 120:50:40 kg/ha + Pendimethaline @ 3.33 l/ha as pre-emergence and the yield was obtained as 39.80 q/ha. In another treatment, the Butachlore 50 EC @ 4 l/ha was used which resulted yield gain of 39.50 q/ha. Hence, the weed may be controlled along with gain in yield. The yield advantage was recorded 6.80 q/ha over farmer's practice.

Effect on Insects and Disease Management

In Saharanpur, farmers were not using any insecticide with variety PB-1 with the application of NPK @ 120:60:40 kg/ha and were getting yield of 38.00 q/ha, sheath blight infestation was 75 %/ plot. The trial was conducted with variety PB-1 and application of NPK @ 120:60:40 kg/ha + $ZnSO_4$ 25kg/ha + Trichoderma @ 2.5 kg/ha gave yield of 44.00 q/ha and sheath blight infestation was 42 % per plot. In other treatment, use of Carbendazim @ 1 kg/ha resulted yield of 43.00 q/ha the sheath blight infestation was 44 % per plot. The yield advantages at different treatments were recorded 4.00-5.00 q/ha over farmers' practice, respectively. KVK Shahajahanpur conducted trial at farmer's fields with variety Pusa Basmati -1 with five replications on control of stem borer. The farmer's practice was no use of chemicals (29.74 q/h) where infestation was higher as 15%. When another bioagent as Pheromone traps @ 20/ha given yield of 32.31 q/ha with infestation of 10 %. The other practice of using Pheromone traps @ 20/ha+ Trichogramma card@ 5/ha, resulted the yield of 34.44 q/ha with lest infestation of 7 %. So, the yield advantage was noted as 2.57 to 4.70 q/ha over farmer's practice. KVK Unnao conducted trial at farmer's fields with variety NDR- 359 with four replications on control of weevil. The farmer-practice was use of salt @ 50-100kg/ha with yield of 38.40 q/ha with higher pest infestation as 21%. When another treatment NPK @ 120:60:60 kg/ha + Carbofuran 3% granule 20 kg/ha was used and yield of 58.38 q/ha was noticed with infestation of 5.81 %. The other practice of using Phorate 10 granules @ 20 kg/ha resulted the yield of 60.18 q/ha with meager infestation 0.03%. So, the yield advantage was obtained as 9.98 and 11.78 q/ha over farmer's practice (Table -5).

Observation on farm Trials

Planning is done without sufficient ground work. Observations to be recorded on different parameters

Table 5: Effect of insects and disease management on paddy yield

KVK	Problem identified	Intervention	Treatment	Production (q/ha)
Saharanpur	Sheath blight infestation	Use of bio agents	T1- Farmers practice (NPK @ 120:60:40kg/ha)	38.00
		Use of bio agents Lack of appropriate pesticide	T2- NPK@120:60:40 + Zn SO_4 @ 25 kg/ ha +Trichoderma harzianum (2.5 kg/ ha)	44.00
			T3 – NPK @120:60:40kg/ha + $ZnSO_4$ @ 25 kg/ha + Carbandazim @ 1 kg/ha	43.00
Shahajahanpur	Attack of stem borer		T1: Farmers practice (No use of P.P. Chemical)	29.74
			T2 : Pheromone traps @ 20/ha	32.31
			T3.: T2 + Trichogramma japonicum card @ 5/ha	34.44
Unnao	Infestation of weevil		T_1 – Farmers Practice (Salt @ 50-100 kg/ ha)	38.4
			T_2 – NPK @120:60:60 kg/ha + Carbofuran 3 % granules @ 20kg/ ha	48.38
			T_3 – NPK @120:60:60 kg/ha + Phorate 10 % granules @ 20kg/ha	50.18

other than yield were not recorded. Extent of pod borer control was not reported. Problem based OFT on fruit crops should be conducted. Treatments should be clear and specific. Soil testing of OFT plots should be done to justify the obtained data. Farmers practice should be specified.

CONCLUSION

It is evident from data that, improved varieties registered yield gains of 8.56 q/ha. The data further suggests that cropping systems registered yield advantage of 4.35-12.15 q/ha with recommended doses of fertilizers i.e. N: P: K @ 120-150: 60-: 40 kg/ha, Zinc 25 kg/ha in deficient areas provided additional yield of .0.98– 7.61 q/ha. The resource conservation technologies viz, use of zero till machine coupled with improved varieties, recommended doses of fertilizers and direct seeded rice with stale bed sowing attained yield advantage of 5.00- 13.60 q/ha. Weed management especially through herbicides application i.e. Pendimethaline @ 3.33 l/ha and Butachlore 50 EC @ 4l/ha provided additional yield of 6.80 q/ha. Organic sources as vermicompost @ 2.5 t/ha and inorganic fertilizer doses provided yield advantage of 2.50 q/ha. Therefore, it has been verified that yield advantages can be attained by the use of improved varieties, integrated weed management and resource conservation technologies in farmers' conditions.

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Inducing Varietal Diversity in Soybean and Maize Through Frontline Demonstrations in Madhya Pradesh

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Abstract

The productivity of Soybean-maize, the most dominant cropping system of Madhya Pradesh, has declined due to poor varietal diversity and lack of extension of appropriate technologies. Taking this into consideration, soybean Variety Pusa-16 (selection) and maize varieties CM 137, CM 138 and NLDC were evaluated and introduced on farmers field with the aim of enriching varietal diversity in M.P. 41 demonstrations were conducted with variety Pusa 16 (S) in Indore , Dewas and Jhabua in 10.38 hectares area, between 2002 to 2006. Farmers earned net profits (Rs/ha) of Rs. 7719 in Soybean and Rs. 18205 in Maize. Farmers realized gross profits per quintal grain production to the tune of Rs.371/q in soybean and Rs 768/q in Maize even under unfavorable conditions. The results of the study indicated that cultivation technologies of new varieties of Soybean and Maize utilized more manual labour (63 ha/ha in Soybean and 84 mandays/ha in Maize) leading to more employment opportunities and equity in rural areas.

Soybean-wheat is the most dominant cropping system in Madhya Pradesh. Recently productivity of soybean and maize has declined due to poor varietal diversity and lack of extension of appropriate technologies. Popular varieties have become susceptible to many insects and diseases. Taking this into consideration, soybean Variety Pusa-16 (selection) and maize varieties CM 137, CM 138 and NLDC were evaluated and introduced on farmers field with the aim of enriching varietal diversity in M.P. The objectives were:

1. Demonstrating the potential of improved varieties of Soybean and Maize to the farmer in Central India.
2. Assessing and refining cultivation technology in the farmers field and demonstrating balanced nutrient management practices to the farmers of the area to improve productivity and profitability.

Major constraints in Soybean and Maize productivity are: ignorance of farmers about improved varieties and technologies, moisture stress particularly in initial as well as final stages of crop growth and poor varietal diversity in M.P. In order to stabilize productivity of Maize and Soybean, the technological needs of the area were identified as varieties having traits like early maturing, drought resistant, non-shattering, insect-pest resistant, stable and high yielding. Recommended package of practices for introduced Soybean variety Pusa-16 (selection). Recommended seed rate was 80 Kg./Ha.

Spacing was 18 inch row to row and 8 inch plant to plant. Weeding and earthing by dora/wheel hoe at 30 days crop age. Subsequent manual weeding and earthing by sickle at 45 days crop age. Apply P:K:S

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in ratio of 20:60:20:20. Use no chemical (Insecticide or weedicide) unless recommended under specific case. Harvest when physical maturity appears (approx. 100 days crop age), thresh the dried crop and store in airtight containers. Recommended package of practices for introduced maize were variety CM 137, CM 138 and NLDC. The seed Rate was 15 Kg/Hectare. Make ridge and furrow after sowing. At least twice earthing on the ridges. Row to row distance should be of 70 cm. Plant to plant Distance was of 25 cm. \Fertilizer application:

Sowing Time: N: P: K (12:32:16) @ 175 Kg+ urea @ 50 Kg per Hectare

First top dressing at 30 days crop-Urea @ 50kg per Hectare

Second top dressing at 45 days crop-Urea @ 50kg per Hectare

Maturity time is 80 to 85 days.

METHODOLOGY

Soybean and Maize Frontline demonstrations were conducted by a team of scientists at chosen locations in farmers' fields with above technologies. Farmers were selected after conducting training meetings at various locations. A representative sample having different categories i.e. large, medium and small was selected for demonstrations. Majority of the farmers were tribal farmers with very small land holdings. Thus size of demonstration plot was 0.25 hectares in Soybean and 0.1 hectares in Maize in majority of the demonstrations. These demonstrations were conducted in various districts of Madhya Pradesh viz. Indore, Dewas and Jhabua during 2002 to 2006, using breeder seed, which was provided free to farmers under Frontline demonstration programme.

Variables for the study were:

Test Variety: Newly recommended variety used in frontline demonstration.

Check Variety: Old variety cultivated by the farmer or nearby farmer in the field near frontline demonstration.

Yield: Grain yield in Quintal/Hectare

% Yield increase: ((Yield of test variety-yield of check variety)/ yield of check variety) X 100

Employment Generation (Hectare/Hectare): Total number of man days (engaged labourers and family members X number of days of work) utilized in crop cultivation and processing operations till bagging, per hectare during crop season.

Cost of Cultivation (Rupees/Hectare): It is calculated by formula-

Cost of (Inputs+ Machinery+ Fuel+ Labour) in per hectare crop cultivation and processing (till bagging) during crop season.

Gross Return (Rupees/Hectare): It is calculated by formula-

Grain Yield (Q/Ha) X Selling Price of Produce (Rs/Q).

Net Return (Rupees/Hectare):It is calculated by formula-

Gross Return (Rs/Ha)- Cost of Cultivation (Rs/Ha).

Gross Return Per Rupee Invested: Gross Return/Cost of Cultivation.

Cost of Production (Rupees/Quintal): It is calculated by formula-

Cost of Cultivation (Rs/ha) / Grain Yield (Q/ha).

Gross Profit (Rupees/Quintal): It is calculated by formula-

Gross Return (Rs/ha)/ Grain Yield (Q/ha)

Data regarding yield and other parameters were collected during 2002 to 2006 personally from farmers after every crop harvest, through structured interview schedule.

RESULTS AND DISCUSSION

Soybean

41 demonstrations were conducted with variety Pusa 16 (S) in Indore , Dewas and Jhabua in 10.38 hectares area, between 2002 to 2006. Check varieties Samrat and JS 335 were sown in 5 hectares area. Pusa 16 (selection) Soybean variety was liked by the farmers of all locations due to its higher numbers of pods, early maturity, non-shattering pods, high tolerance

to drought and water logging and higher resistance to insect-pests. Farmers reported lesser insect-pest problem in Pusa-16 variety compared to Samrat and JS 335. Average grain yield recorded was 16.8 Q/ha and 11 Q/ha, in test and check varieties respectively. Yield increase was 58 % over check in these demonstrations. Employment generated (mandays per ha.) was 63 and 44 in test and check varieties respectively. Net Return (Rs./ha.) was Rs. 7719 and Rs. 1630 for the test and check varieties respectively. Cost of production of one quintal grain was Rs.699 and Rs.944 for the test and check varieties respectively. Selling price (Rs./Q) was 1070 and 950 for the test and check varieties respectively. Gross-profit per quintal grain production was Rs.371 and Rs. 6 for the test and check varieties respectively. Gross return per rupee invested was 1.7 for test and 1.2 for the check varieties. Details are presented in Table-1.

However the average yield reported was less than the potential in Pusa 16 (selection) in test and check varieties due to:

Scanty rainfall/ moisture stress particularly in initial as well as final stages of crop growth.

Cloudy weather during crop growth in majority of the demonstrations.

Lack of timely and proper weed control in majority of the demonstrations

Severe insect–pest damage to the crop in majority of the demonstrations by: Heliothis, Girdle beetle and Blue beetle.

Maize

9 demonstrations were conducted with varieties CM 137, CM 138 and NLDC in Indore , Dewas and Jhabua in 1.43 hectares area, between 2004 to 2006. Check variety 'local maize' was sown in 1.79 hectares area. Test varieties were liked by the farmers due to bigger size of cobs, early maturity, and higher resistance to insect-pests. Average grain yield

Table 1: Soybean yield and profitability in Frontline Demonstrations

Year	No. of demons-trations	Location wise demons-trations	Area (ha)		Variety		Yield (q/ha)		% Yield increase	Employment generated (man days)		Cost of cultivation (Rs/ha)		Gross return (Rs/ha)		Net return (Rs/ha)		Gross return per rupee invested		Cost of production (Rs/q)		Selling price (Rs/q)		Gross profit (Rs/q)	
			Test	Check	Test	Check	Test	Check		Test	Check	Test	Check	Test	Check	Test	Check	Test	Check	Test	Check	Test	Check	Test	Check
2002	15	Indore-15	7.5	1.9	Pusa 16(S)	Samrat JS335	10	6	74	56	41	9272	8266	9373	5510	102	-2756	1	0.7	1018	1532	950	950	-68	-582
2003	5	Indore-5	1.6	1.4	Pusa 16(S)	Samrat JS335	15	8	83	65	43	10870	8560	15960	7980	5090	-580	1.4	0.9	793	1154	1050	950	257	-204
2004	3	Indore-2 Dewas-1	0.55	1	Pusa 16(S)	Samrat JS335	19	14	30	65	46	10867	9233	19600	13617	87323	4383	1.8	1.5	587	650	1050	950	463	300
2005	3	Jhabua-3	0.4	0.417	Pusa 16(S)	Samrat JS335	20	13	57	67	47	11233	9300	23383	12350	12150	3050	2.1	1.3	557	722	1150	950	593	228
2006	15	Jhabua-15	0.33	0.35	Pusa 16(S)	Samrat JS335	20	14	47	64	45	10710	8993	23230	13047	12520	4053	2.2	1.5	541	663	1150	950	609	287
Total/ average	41	Indore-22 Dewas-1 Jhabua-15	10.38	5.067	Pusa 16(S)	Samrat JS335	16.8	11	58	63	44	10590	8870	18309	10501	7719	1630	1.7	1.2	699	944	1070	950	371	6

recorded was 23 Q/ha and 15 Q/ha, in test and check varieties respectively. Yield increase was 59 % over check in these demonstrations. Employment generated (man days per ha.) was 84 and 45 in test and check varieties respectively. Net Return (Rs./ha.) was Rs. 18205 and Rs. 8589 for the test and check varieties respectively. Cost of production of one quintal grain was Rs.598 and Rs.605 for the test and check varieties respectively. Selling price (Rs./Q) was 1367 and 1167 for the test and check varieties respectively. Gross-profit per quintal grain production was Rs.768 and Rs. 562 for the test and check varieties respectively. Gross return per rupee invested was 2.4 for test and 2.0 for the check varieties. Details are presented in Table-2.

Table 2: Maize yield and profitability in Frontline Demonstrations

Year	No. of demons-trations	Location wise demons-trations	Area (ha)		Variety		Yield (q/ha)		% Yield	Employment generated (man days)		Cost of cultivation (Rs/ha)		Gross return (Rs/ha)		Net return (Rs/ha)		Gross return per rupee invested		Cost of production (Rs/q)		Selling price (Rs/q)		Gross profit (Rs/q)	
			Test	Check	Test	Check	Test	Check	increase	Test	Check	Test	Check	Test	Check	Test	Check	Test	Check	Test	Check	Test	Check	Test	Check
2004	4	Indore-3 Dewas-1	0.8	1	NLDC CM137	Local	23	14	73	95	46	15767	9100	28000	13667	12233	4567	1.8	1.5	677	670	1200	1000	523	330
2005	2	Jhabua-2	0.38	0.46	NLDC CM137	Local	23	15.5	49	73	42	12100	8300	32200	18600	20100	10300	2.7	2.2	528	536	1400	1200	872	664
2006	3	Jhabua-3	0.25	0.33	CM138	Local	24	16	55	85	47	14217	9467	36500	20367	22283	10900	2.6	2.2	590	609	1500	1300	910	691
Total/ average	9	Indore-3 Dewas-1 Jhabua-5	1.43	1.79	NLDC CM137 CM138	Local	23	15	59	84	45	14028	8956	32233	17545	18205	8589	2.4	2.0	598	605	1367	1167	768	562

CONCLUSION

Induced varietal diversity will lead to crop yield sustainability in Soybean and Maize in Madhya Pradesh. Farmers earned net profits (Rs/ha) of Rs. 7719 in Soybean and Rs. 18205 in Maize. Farmers realized gross profits per quintal grain production to the tune of Rs.371/q in soybean and Rs 768/q in Maize even under unfavorable conditions. Cultivation technologies of new varieties of Soybean and Maize utilized more manual labour (63 ha/ha in Soybean and 84 mandays/ha in Maize) leading to more employment opportunities and equity in rural areas. Induced varietal diversity will improve productivity and yield stability under favourable conditions in future.

Knowledge of Women Beneficiaries Regarding Various Aspects of Dairy Cooperatives

Deepti*, Beena Yadav and Sumitra Yadav*****

Abstract

Women are the key figures in dairying and contribute more than men folk. Women dairy cooperatives (WDC) are considered as the nucleus for multifarious activities concerning women development. The results of present study are based on data collected from 100 randomly selected beneficiaries of four WDCs from two districts of Haryana state. The findings indicate that out of seven objectives, most of the women beneficiaries were aware of only two objectives of WDC. Although women had knowledge of role of cooperatives in training of women in animal care and management and bringing about economic equality but it was limited to a small segment of the respondents. The knowledge of women about organizational aspects suggested that majority of women had knowledge of membership criteria of WDC and name of society secretary but knowledge of women about number of members and amount of milk required to get the society registered, name of society chairperson and mode of selection of secretary and chairperson was very small. Majority of the members had knowledge of rate fixation parameter, fat testing, place of milk being transferred from WDC, utilization of milk at milk plant and frequency of payment however, provision of bonus was the only one aspect about which majority of the respondents were ignorant.

Livestock and agriculture constitute an integral part of production systems in India. These are the two main supports on which entire structure of village life rests. Though Indian economy is primarily based on agriculture, yet agriculture alone is unable to provide ample employment opportunities and income to its people. Increase in population, stagnation in production, high cost of agricultural inputs and climatic uncertainties are the major challenge faced by agriculture. Viewed in this context, livestock as an alternative source of income can be ideally suited.

Women are the key figures in dairying and contribute more than men folk. About 85 per cent of those involved in dairying are women who have close linkages with animals. They consider them as part of their family. Women are more knowledge able about behavior, characteristics and health aspects of each animal. Women focused approach was advocated as a part of the strategy under which sufficient number of women dairy cooperative societies (WDCS) were formed at village level. Considering WDC as an agency of women development WDC project was launched in Haryana in the year 1998. The entire structure of WDC is seen as capable of bringing about growth and development. The social gains for exploited sections of society are expected to be high.

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Many questions arise like what is knowledge level of women about various aspects of WDc. Are the societies really managed by women? What has been the impact of WDC on women and their family? Assuming that dairy production is based on an intensified involvement of female labour, what effects will it have on women's social life and leisure time? Do women really have access to the earned income? The types of restraining factors or constraints hindering the active participation of women in WDC also need to be explored. Keeping these facts in mind, it was felt imperative to conduct present study with the specific objective of ascertaining the knowledge of women beneficiaries about various aspects of dairy cooperatives.

METHODOLOGY

The study required the sample of women dairy cooperative members therefore, Haryana state was selected purposively as the locale for the present investigation because "Women Dairy Cooperative (WDC) Project" was launched in all the milksheds of state in 1998). There were total six districts in Haryana state where WDC scheme was in operation. The districts were Kurukshetra, Ambala, Jind, Sirsa, Rohtak and Faridabad. Out of six districts, two districts namely Sirsa and Kurukshetra were selected randomly. There were 23 WDC in Sirsa and 9 in Kurukshetra district. Two WDC from each district were randomly selected, thus a total of four WDCs were included in present investigation. From Sirsa district Shahpur Begu and Anandgarh WDC and from Kurukshetra district Jogimanjhra and Bijjarpur WDC were selected at random.

Twenty five members from each of the selected 4 WDCs constituted the final sample for present investigation. Out of 25 women, 9 were the members of village level management committee. The remaining 16 members were selected randomly. In this way 100 women beneficiaries constituted the total sample for present investigation.

Knowledge was operationalized as amount of correct information possessed by the respondents regarding objectives, organizational aspects, support services, milk sale and consumption pattern, of dairy cooperatives. Knowledge was measured with the help of inventory developed for this purpose. Comprehensive close ended statements were prepared and compiled through due consultation with relevant literature, officials of milk-sheds and project copy of WDC. Due care was taken to include pertinent information for all the three aspects.

RESULTS AND DISCUSSION

Women dairy co-operative societies (WDCS) were established to act as a vehicle for propagation of various developmental activities for rural women along with providing a regular source of income. It was assumed that WDC would provide an organized forum through which women could address their personal and social grievances and become active participants in development and information on knowledge of women beneficiaries about following aspects of WDC was incorporated in present study.

i) Knowledge of women beneficiaries regarding objectives of WDC

ii) Knowledge of women beneficiaries regarding organizational aspects of WDC.

iii) Knowledge of women beneficiaries regarding milk sale and consumption pattern

i) Knowledge of women beneficiaries regarding objectives of WDC

Knowledge of beneficiaries regarding objectives of WDC is presented in Table 1. There were total 13 objectives of WDC project but only seven objectives were included in present study to elicit response as these were directly concerned to women. It is apparent from the data incorporated in Table 1 that 80 per cent women were aware of WDC's contribution in providing employment to SC/ ST and weaker section women which was followed

by 53 per cent respondents who had knowledge about objective of WDC to eradicate exploitation of milk producers. In view of slightly more than one-fourth (27%) of the respondents the objective of WDC was to train women in animal care and management followed by 22 women who revealed objective of WDC to bring about economic utility and social justice. Equal percentage of the women i.e. 15 per cent expressed the objectives of WDC in terms of bringing women in developmental process and to generate grass root level leadership. Very small proportion of the respondents i.e. eight per cent reported utilization of WDC platform to introduce women related activities as one of its objectives.

It can therefore be inferred that most of the women beneficiaries were aware of only two objectives of WDC i.e. to make provision for employment to SC/ ST and weaker section women and eradication of producers' exploitation. Although women had knowledge of role of co-operatives in training of women in animal care and management and bringing about economic equality but it was limited to a small segment of the respondents. It seems logical also because the respondents in present study were mostly from weaker section of the society whose land holding was quite low and dairying as a subsidiary occupation succeeded in providing employment to them as well as other family members. Earlier the milk producers used to get loans from milk vendors for purchasing milch animals, therefore they had to supply a fixed amount of milk to the vendors as decided by them. It might be the reason that the objective of WDC in eradication of exploitation was highlighted by more than 50 percent respondents. Low level of knowledge about other objectives is an indicator of the fact that majority of the women beneficiaries had not benefited in the manner as planned through other objectives, henceforth they were found to have very little knowledge about these objectives.

ii) Knowledge of women beneficiaries regarding organizational aspects of women dairy co-operatives

It is apparent from Table 2 that all of the respondents had knowledge of the fact that the women who possessed milk producing animals and agreed to supply milk to WDC could be registered as its member. Eighty percent of the women were informed about the fact that the member should be a resident of village. However, knowledge of women regarding age limit to become member was quite low and only nine percent could tell about it correctly. Not even a single woman had knowledge of purchasing a share of value of Rs. 10 as mandatory for becoming member of dairy co-operative.

Table 1. Knowledge of women beneficiaries regarding objectives of Women Dairy Co-operatives

(N=100)

S. No.	Knowledge items	Frequency/ Percentage
1.	Providing employment to SC/ST and weaker section women	80
2.	Eradication of milk producers' exploitation	53
3.	Training of women in animal care and management	27
4.	Bringing about economic equality and social justice by focusing attention on women	22
5.	Creation of conditions for active participation of women ill developmental process	15
6.	Generation of grass root level leadership	15
7.	Utilizing dairy platform as a spring board to introduce women related activities	08

Table 2. Knowledge of women beneficiaries regarding organizational aspects of WDC

N=100

S.No	Knowledge items	Frequency/ percentage
1.	Criteria for membership	
	a) Resident of village	80
	b) Rears milch animals	100
	c) Agrees to supply surplus milk to society	100
	d) Owner of at least one share of Rs.10	0
	e) Completed 18 years of age	9
2.	Members required to form dairy cooperation society	
	a) 15-20 members	15
	b) 20-30 members	65
	c) 30-40 members	12
	d) *At least 40 members	8
3.	Amount of milk supply required to get the society registered	
	a) Upto 30 ltr.	36
	b) 30-50 ltr.	40
	c) 50-70 ltr.	20
	d) *Upto 80 ltr.	4
4.	Knowledge about the managing committee	
	a) Yes	55
	b) No	45
5.	Number of members in managing committee	
	a) 3-5 members	14
	b) 6-8 members	29
	c) *9 members	12
6.	Name of managing committee chairperson	
	a) Yes	17
	b) No	83
7.	Name of the secretary	
	a) Yes	82
	b) No	18
8.	Mode of managing committee selection/ secretary	
	a) By dairy supervisor	90
	b) *Voting by or opinion of members	10

*Correct response.

At least forty members are required to get the society registered and it was noted that only eight percent respondents had correct knowledge about this however, 12 percent women were those who expressed the number of members required between 30-40 but could not tell the exact number.

Women's knowledge about amount of milk required to get the society registered was quite low and only four respondents could tell about the amount of milk required i.e. 80 litres.

More than half of the respondents (55%) knew about the existence of managing committee at village level to supervise WDC activities. Out of these 55 percent women, 43 of them did not know the exact number of members in managing committee. Only 12 percent respondents could tell the exact number (9) of members constituting the management committee at village level. Chairman of managing committee and secretary of WDC are responsible for undertaking various activities of WDC in an efficient manner at village level but data presented in Table 1 reveal that only 17percent women knew the name of managing committee chairperson, however, as far as their knowledge about name of dairy secretary is concerned it was observed that quite a good majority of them (82%) was found to know the name of dairy secretary. When the respondents were questioned about the mode of selection *of* chairperson and secretary it was reported by overwhelming majority (90%) of the respondents that it was the duty of dairy supervisor to elect them. Though right procedure for selecting these persons is either through voting by members or by consensus of members but only 10 percent respondents could answer about it correctly.

The information on knowledge of women about organizational aspects suggests that majority of women had knowledge of membership criteria of WDC and name of society secretary. However, very small percentage of women had knowledge of number of members and amount of milk required to

get the society registered, name of society chairperson and mode of selection of secretary and chairperson. More than half of the respondents were knowledgeable about the formation of management committee. The emerged results seem to be appealing to general consensus that for the organizational aspects to which women secretary and members were directly related, they were found to exhibit higher knowledge about these aspects. More women knew the name of dairy secretary than the name of chairperson. As dairy secretary directly interacts with members by collecting milk, maintaining individual records and by disbursing payments. She meets women members twice a day, however, the role of chairperson is to supervise activities of cooperatives for smooth running of society. Even the member of management committee could not tell the name of other members which points towards low level of interaction and co-ordination among society members as well with other members. As women members were not directly concerned with number of society members and amount of milk supply, therefore majority of them could not reply regarding these aspects. Dairy co-operatives are democratic institutions which are of the women, for the women and by the women but these aspects were found to be missing as far as knowledge of women is concerned. The members did not know the right procedure of selecting chairperson and secretary and they considered it the duty of milk plant officials. No doubt all the chairpersons and secretaries were elected after taking the opinion or suggestions of members by official but the members were not aware of their right regarding selection of chairperson and secretary.

iii) Knowledge of women beneficiaries regarding milk sale and consumption pattern

It is evident from Table 3 that a very high majority of the respondents had knowledge about standard parameter for rate fixation of milk (92%), milk test conducted at WDC (96%), reason for variation in price of milk inspite of same volume (88%), fat content of their milk samples (91 %) and milk price as per fat level (84%).

Majority of the respondents i. e. 82 percent had knowledge about the place where milk collected by society was transported, more than two-third (67%) of them had knowledge that milk was utilized after due processing in various forms, 35 of them were able to tell the name of 2-4 products (butter, ghee, packet milk and ice-cream) and rest of them i. e. 32 percent were those who were able to express the name of 5-7 products (butter, ghee, packet milk, ice-cream, flavoured, milk powder and cheese) which were prepared after processing of milk in milk plant. Ninety one percent of the respondents had erudition about the frequency of payment to milk suppliers.

About provision of bonus facility, knowledge of respondents was quite low and 87 percent of them did not know about this provision. The respondents who were aware about bonus provision, not even a single of them knew about criteria of bonus money fixation.

It can thus be summarized that majority of the members had knowledge of various aspects pertaining to milk sale and consumption pattern like rate fixation parameter, fat test, place of milk transportation from WDC, utilization of milk at milk plant and frequency of payment. Provision of bonus was the only one aspect about which, majority of the respondents were ignorant.

The findings are an indicator of the fact that women were not only concerned with supplying milk to co-operative society and receiving payments but were highly informed about the price they were getting as per fat content and variation in milk rate due to fat level. Majority of the respondent, were habitual of adding water to milk to increase its volume earlier but cooperative societies succeeded in creating a dent in attitude of women. Visit to local milk plant helped in shedding off women's fear about misutilization

Table 3: Knowledge of women beneficiaries regarding various aspects of sale and consumption pattern of milk

N=100

S.No	Knowledge items	Frequency/ percentage
1.	Standard parameter for rate fixation of milk	
	a) Yield	5
	b) Fat content	92
	c) Fat and yield	3
2.	Name of milk test conducted at WDC	
	a) Yes (Fat test)	96
	b) No	4
3.	Reason for variation in earning of two members who supply equal amount of milk to society	
	a) Due to fat content	88
	b) Do not know	12
4.	Knowledge about the fat level of milk	
	a) Yes	91
	b) No	9
5.	Knowledge about milk rate as per fat content	
	a) Yes	84
	b) No	16
6.	Place of transportation of milk from co-operative society	
	a) Local city	12
	b) Milk plant	82
	c) Do not know	6
7.	Mode of utilization of milk	
	a) Utilized as such	33
	b) Utilized after processing	67
8.	Number of products prepared after processing	
	a) 2-4 products (Ghee, butter, packet milk, ice-cream)	35
	b) 5-7 products (Ghee, butter, packet milk, ice-cream, milk powder, flavoured milk, cheese)	32
9.	Frequency of payment as per society norms	
	a) After 10 days	91
	b) Between 10-15 days	7
	c) After 15 days	2
10.	Provision of bonus	
	a) Yes	13
	b) No	87

of milk by exposing women to different products prepared after processing of milk. Frequency of payment between 10-15 days as reported by members is reflection of the fact that WDC at village level is a regular source of income to members which will act as a basis for making these societies more credible in coming times.

Lack of knowledge about bonus disbursement was supported through discussion with milk plant officials. The officials informed that the net profit earned by the selected four societies was too less to be disbursed. When sufficient amount would get deposited it would be disbursed. This might be the reason that very small segment of the respondents knew about bonus facility although they had not availed it. They came to know about it by interaction with members of other societies during training programmes organized by milk plant from time to time.

The results are in conformity with the findings of Kaushik and Singal (1993), Rangekar (1994) and Deori (1995) who reported that women respondents had knowledge of fat test and fat content but were less informed about loaning facilities.

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Appropriateness of Drudgery Reduction Technologies as Perceived by Farm Women

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Abstract

The present study was undertaken to find out appropriateness of drudgery reducing technologies as perceived by farm women. The study was conducted among 120 women KVK trainees in Bhilwara district of Rajasthan. Drudgery reducing technologies were identified for two highest drudgery prone tasks and appropriate technologies were transfered and farm women trained. Data were collected after one week of intervention period. Appropriateness was measured in terms of benefits perceived. The respondents reported serrated sickle and wheel hoe as highly appropriate technologies in terms of drudgery reduction.

Farm women still follow the age old methods and their tasks are full of drudgery. A desired change in the life of rural women, which is full of drudgery can be brought by the use of application of simple, scientific and appropriate technologies.

The study was undertaken with the objective to find out the appropriateness of drudgery reducing technologoes as percieved by farm women.

METHODOLOGY

The study was carried out in Bhilwara district of Rajasthan. Out of eleven panchayat Samities in the district, two panchayat samities were selected randomly, which were Kotri and Suwana. Two villages from each panchayat samiti were selected purposively keeping in view ease of approach and familiarity with the area. Amongst a sample of 120 villages, from each village 30 farm women who were willing to take training at KVK and one week intervention period of one week in their own village were selected for study. Information related to drudgery identification was gathered from farm women of small & marginal families through PRA. Highest drudgery prone tasks perceived for farm activities were Ist harvesting and IInd weeding & hoeing. Drudgery reducing technologies i.e. serrated sickle for harvesting and wheel hoe for weeding & hoeing were selected. Technologies were transferred through four trainings at KVK and then by distributing them the implements to use at their own farm.

Appropriateness was judged after one week of intervention. The scale, to assess appropriateness of technologies was developed seeking help of scale developed by Ganguly & Singh (1999).

Mean weighted scores were computed and following categories of appropriateness were made.

i)	Not appropriate	-	0	-	0.5
ii)	Some what appropriate	-	0.6	-	1.5
iii)	Highly appropriate	-	1.6	-	2.0

RESULTS & DISCUSSION

Appropriateness of serrated sickle

Appropriateness of serrated sickle was measured in terms of benefits perceived over traditional sickle.

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Table 1: Appropriateness of serrated sickle in terms of benefits perceived by farm women

N=120

S. No.	Benefits perceived	Mean weighted scores
1.	Easy to use	1.33
2.	Energy saving	1.91
3.	Time saving	1.91
4.	Reduces bodyache, specially backache	2
5.	Feasible costwise	1.91

Perusal of table 1 reveals that serrated sickle was considered highly appropriate in terms of four parameters as the score range was between 1.9 - 2.00. Out of these the benefit (1) reduces bodyache specially backache was placed on highest rank by the respondents. The technology was also considered highly appropriate in terms of energy and time saving and feasible cost-wise. Easy to use was placed in category of somewhat appropriate as it was between the score range of 0.6 - 1.5. The reason is quite obvious that respondents were used to traditional sickle and a change in its handling and procedure of cutting requires practice.

Table 2: Appropriateness of wheel hoe in terms of benefits perceived by farm women.

N = 120

S. No.	Benefits perceived	Mean weighted scores
1.	Easy to use	2
2.	Energy saving	2
3.	Time saving	2
4.	Money saving	2
5.	Feasible cost-wise	1.8
6.	Reduce bodyache specially backache & legache	2

The findings of the study are in conformity with Gite and Agarwal (2000) who revealed that drudgery reduction due to use of improved sickle was about 16.5 percent as compared to local sickle. They also revealed that improved sickle requires less effort for cutting and reduce the drudgery in harvesting.

Appropriateness of wheel hoe

Perusal of table 2 clearly points out that wheel hoe was considered highly appropriate in term of all the six parameters as scores range was between 1.8 - 2. Five parameters i.e. easy to use, energy, time and money saving as well as reduce bodyache specially backache and legache were given highest rank. Cost-wise feasibility was placed next to them but it was also in category of highly appropriate which shows that cost was not considered barrier as compared to its advantages. It is enthusiastic to note that an implement which was totally new to all the respondents was learnt by them very well. On inquiry it was further revealed that this implement was liked very much and made their task of weeding very easy.

CONCLUSION

The results of the study indicated that serrated sickle and wheel hoe were considered highly appropriate in terms of drudgery reducing. Improved technologies helped them to gain confidence. This was possible because of “Seeing is believing” & “Learning by doing”, The demonstration at Krishi Vigyan Kendra and intervention period provided them the opportunities to use it in their own farm situation. The repetitive use of technology helped them to perceive most of the benefits.

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Consumer Acceptability Trials of Double Fortified Salt (Iodine & Iron) Under Field Conditions in District Jhajjar of Haryana State

Vashisht Shashi and Seema Puri

Abstract

Acceptability and efficacy trials of some formulations of Double Fortified Salt have shown promising results. This research was formulated with the objective of studying the acceptability of two formulations of double fortified salt (premix formulations using encapsulated ferrous fumarate (EFF) and micronized ferric pyrophosphate (ETH)) as compared to iodized salt in a community setting. The study was carried out in two villages in Haryana, India covering 248 randomly selected households comprising of 1665 family members. Initially, female heads of the households were interviewed using a structured questionnaire detailing their socio-demographic profile, patterns of salt consumption and storage. Results revealed that the female respondents (31-40 years) were mostly illiterate and farming was their main occupation. Most households were using locally available packed salt. Loose rock salt was used both for human consumption and for livestock. Consumer acceptability trials were carried out wherein the two DFS formulations and iodized salt were randomly distributed among the subjects. The households were monitored for use of salt for 3 months. Women who cooked meals were instructed to report observations relating to the appearance, color, flavor and texture of different foods cooked with the sample salt. The overall acceptability of the three sample salts was assessed based on the parameters of appearance, colour and taste.Subsequently, sensory trials were conducted to determine the acceptability of three salts in prepared dishes. For better acceptability, it is recommended that the colour, texture and overall appearance of both DFS formulations must be improved so that their health benefits can be availed of.

For decades, the world's wealthiest nations have been fortifying common foods as a way of delivering essential vitamin and minerals to their population. This is a relatively new concept in developing countries. It need not necessitate changes in the customary diets of the population and can be sustained over a long period provided a suitable vehicle is identified and the process is properly managed and cost effective. Salt is consumed in small, fairly constant daily amounts by almost everybody and is often considered an ideal vehicle for carrying extra vitamins and minerals.

Success of salt iodization initiatives are now well documented demonstrating significant reductions in the prevalence of Iodine Deficiency Disorders in areas where it has been implemented. Further, rapid progress in adding iodine to two-thirds of the world's household salt has fuelled the hopes that the problem of iron deficiency might be tackled by double fortification of salt. Various formulations of DFS have been developed in several countries. Some acceptability and efficacy trials for these formulations have shown promising results. Hence, the double fortification of salt is now considered a

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viable technology to add iron to iodized salt in a stable cost effective way to overcome two major health problems in India. It was, therefore, proposed to conduct acceptability trials under field conditions in India to gauge consumer willingness to use double fortified salt.

METHODOLOGY

This research was formulated with the objective of studying the acceptability of two formulations of double fortified salt (ETH and EFF) as compared to iodized salt in a community setting. Ethical clearance for the study was obtained from The Institutional Ethics Committee of Institute of Home Economics in its meeting held on 19th November 2005.

The study was carried out in three phases: baseline survey, acceptability trials with sample salt and sensory evaluation. The locale of investigation was two villages in District Jhajjar, Haryana – Dadri Toye and Sasroli villages. A total of 248 randomly selected households comprising of 1665 family members from the two villages participated in the study.

In phase I of the study, female heads of the selected households were interviewed for providing baseline information about their respective families. A structured questionnaire was used to gather information on socio-demographic profile, patterns of food and salt consumption. Information was also sought on the varieties/ brands of salt available in the community and the brand used by their family; frequency of cooking with salt, the quantity and cost of salt purchased each time in a month and the mode of storage.

In the second phase, consumer acceptability trials with sample salts were carried out. The three types of salt was packed in half-kilogram packets, suitably labeled and randomly distributed among the study population. The households were monitored for use of salt and to ensure compliance. Female respondents who cooked meals for the families were instructed to report the observations relating to the appearance, color, flavor and texture of different foods cooked with the sample salt distributed to them. They were also instructed to report any changes noticed in comparison to the food cooked by their usual salt. The overall acceptability of the three sample salts was assessed based on the parameters of appearance, colour and taste and the salts were then finally ranked on the basis of these overall acceptability scores.

Phase III of the study comprised of sensory trials conducted in the community as well as the research centre to determine the acceptability of three types of salts in prepared dishes. A scoring pattern was adopted for various parameters i.e. colour, texture, appearance, taste and overall acceptability of the cooked preparations

RESULTS AND DISCUSSIONS

The results are presented as under-

Table 1: Base line survey

(N=248)

S.No.	Particulars	Frequency (%)
1.	Age—Below 25 yrs.	14 (06)
	26 yrs –30 yrs	68 (27)
	31—40 yrs	166 (67)
2.	Educational qualifications-	
	Illiterate	84 (34)
	Below primary	47 (19)
	Primary	50 (20)
	Middle	30 (12)
	Below matric	25 (10)
	Matric	12 (05)
3.	Type of family-	
	Nuclear	238 (96)
	Joint	10 (04)
4.	Size of family-	
	Below 5	100 (40)
	6-10	138 (56)
	Above 10	10 (04)
5.	Occupation-	
	Agriculture	90 (36)

	Agri+ Service	25 (10)
	Independent Profession	56 (23)
	Labourer	77 (31)
6.	Monthly family income-	
	Below 2000/-	60 (24)
	2001/—5000/-	145 (59)
	5001/—10,000/-	35 (14)
	Above 10,000/-	08 (03)
7.	Food habits-	
	Vegetarians	248 (100)
	Non-vegetarians	-
8.	Addition of salt to meals	
	Yes	248 (100)
	No	-
9.	Addition of salt to dough-	
	Yes	248 (100)
	No	-

Figures in parentheses indicate percentages

Table—1 reveals that 2/3rd (67%) of the respondents were mainly in the age group of 31—40 yrs, one third of the females were illiterate (34%) followed by having education upto primary and below primary level. Only 5 % of the respondents had education upto matric level. Their main occupation was found to be agriculture, labourers, independent profession and service respectively.

As far as type of family is concerned , vast majority (96%) of the families were nuclear. Fifty six percent of the families had members from 6-10, whereas 40 percent families also had family size below 5 members. The average monthly family income of the respondents was from Rs.2000/- to Rs.5000/- (58.5%), whereas nearly one fourth of the families had monthly income below 2000/- per month i.e. from below poverty line also. All the families were vegetarians in both the villages and all were in the habit of putting salt over to meals and adding salt to dough. Loose rock salt was also used both for human consumption as well as for livestock.

Table 2: Salt consumption patern

(N=248)

S.No.	Particulars	Frequency (%)
1.	Type of salt used-----Packed	158 (64)
	-----Loose	90 (36)
2.	Awareness regarding type of salt-	
	Iodised	60 (24.2)
	Uniodised	78 (31.4)
	Not aware	110 (44.3)
3.	Determinant of choice of salt-	
	Brand	Nil
	Cost	30 (12)
	Colour	-
	Availability	200 (81)
	Health benefits	18 (07)
4.	Average monthly consumption-	
	Less than 500 gms.	Nil
	1 kg.	15 (06)
	1.5 kg.—2 kg.	85 (34)
	2—2.5 kg.	138 (56)
	More than 2.5 kg.	10 (04)
5.	Frequency of buying salt-	
	Once a week	170 (69)
	Fortnightly	38 15)
	Monthly	40 (16)
6.	Source of buying salt-	
	From village itself	248 (100)
	Nearby city/town	-
7.	Storage of salt-	
	Plastic container	209 (84)
	Earthen wares	39 (16)
8.	Place of storing salt-	
	In cupboard	11 (4.4)
	Near the chulha	25 (10)
	On the kitchen slab	212 (85.5)
9.	Change in the quality over storage period-	
	Colour	Nil
	Texture	85 (34)
	Taste	Nil

Figures in parentheses indicate percentages

Table—2 depicts the salt consumption pattern of the families . The data reveals that nearly 2/3rd (64%) of the families were using packed salt and nearly 1/3rd used loose .Forty four percent families were not aware about the salt whether it is iodised or uniodised , only ¼ th of the families were aware and using iodised salt. The availability of the salt in local market was the determinant of the choice of salt to the most of the families .Average monthly consumption of the salt was 2-2.5 kg. and frequency of buying salt was once a week or whenever required and source of buying salt was from village itself. Most of the families stored the in plastic containers (84%) followed by earthen wares (16%) . Place of keeping containers was on kitchen slabs (85.5%). There was no change observed in the colour ,and taste of salt over storage ,only there was some change observed in the texture during rainy season. However ,most of the families did not stored for long.

Table 3: Consumer acceptability criteria for double fortified salt

(N=248)

S.No.	Particulars	Frequency (%)
1.	Rating of salt---	
	Appearance----Satisfactory	190 (77)
	Good	58 (23)
	Unsatisfactory	Nil
	Colour-------Satisfactory	248 (100)
	Unsatisfactory	Nil
	Taste----------Good	55 (22)
	Very good	193 (78)
	Texture----------Unsatisfactory	248 (100)
2.	Reasons of choice—	
	Appearance	135 (54)
	Taste	248 (100)
	Health benefits	248 (100)
3.	Points of difference-	
	Taste	190 (77)
	Appearance	248 (100)
	Texture	248 (100)
4.	Amount used-	
	Less used	190 (77)
	More used	10 (04)
	Equally used	48 (19)
5.	Undesirable change in any dish-	
	No change	248 (100)
6.	Willingness to buy even at higher cost due to health benefits-	
	Yes	225 (91)
	No	23 (09)

Consumer acceptability of the salts was carried out both for visual parameters as well as for use of salt in cooked preparations. All the three sample salts - iodized as well as the two DFS formulations were well accepted by the study group. Iodized salt had a slightly higher acceptability as compared to both ETH and EFF which ranked closely in their overall acceptability.

Table-3 reveals the consumer acceptability criteria for DFS in two villages. The data explains that rating of the salt was done on four parameters viz; appearance ,colour, taste and texture. Appearance was found to be satisfactory (77%) and good (23%)by the families. The colour of the salt was expressed satisfactory by all. The taste of DFS was also expressed very good (78%) and good (22%) by the respondents. However ,the texture of the salt was expressed as unsatisfactory by all the respondents, Overall rating was appearance and colour were satisfactory , taste very good and texture unsatisfactory The .reason of choice of DFS was its taste and health benefits. The points of difference in common salt and DFS was its appearance ,texture and taste respectively. Majority of the respondents explained that DFS is used in lesser quantities (77%), whereas 19 % opined for its equal consumption . There was no undesirable change observed in any dish prepared by this salt, and majority (91%) were willing to buy this salt even at slightly higher cost if made available due to its health benefits.

In the community it was found that there were no major differences observed in the preparations cooked with the three types of sample salts. However,the EFF salt imparted a better colour, taste and appearance to the cooked preparations, while ETH was better accepted in uncooked preparations. The results were similar at the research centre, with a much larger number of panelists, who were also more aware and educated. As observed in the community, observations at the research centre also revealed that EFF salt gave a richer colour to the preparations made in the form of a gravy using water. The ETH salt was found to be better in preparations that were cooked to a dry form.

Visual evaluation of salt done at the research centre also indicated that the colour, texture and hence, overall appearance of both the DFS must be improved to make them more acceptable. Iodized salt was the best choice as it was closest in appearance, colour and taste to the salt already in use by the community. As the visual parameters are the first encounters that determine acceptability, it is recommended that they should be improved particularly in the case of DFS formulations so that their health benefits can be availed of. There was general willingness in the community to buy the DFS at a nominally higher price in view of its health benefits.

CONCLUSIONS

The overall acceptability of the three sample salts was assessed based on the parameters of appearance ,colour and taste. While the three sample salts – iodized as well as the two DFS formulations were well accepted , iodized salt had a slightly higher acceptability. Subsequently, sensory trials were conducted to determine the acceptability of three salts in prepared dishes. No major differences were observed in the preparations cooked with the three salts. However , EFF imparted a better colour, taste and appearance to cooked preparations ,while ETH was better accepted in uncooked preparations. Moreover ,EFF gave a richer colour to gravy preparations using water. ETH was better in dry preparations .Visual evaluation of salt indicated iodised salt was the best choice as it was closest in appearance ,colour and taste to the salt already used by the community. For better acceptability , it is recommended that the colour, texture and overall appearance of both DFS formulations must be improved so that their health benefits can be availed of.

Processing Of Merino Wool For Quality Fabric

Sapna Gautam* and Alka Goel**

Abstract

The development of rural enterprise is crucial for the achievement of broader objectives of economic empowerment of rural artisans, including poverty alleviation and the promotion of more democratic and pluralist societies in mountain regions. This could be better achieved through utilizing the locally available resources and adding value for higher remuneration. One such resource easily available in the mountain region is merino wool. With a view to find out an easy method of merino wool processing, studies were made for refinement at yarn and fabric stages to benefit the skilled weavers. The yarn prepared on Bageshwari Charkha was tested for the physical properties viz. yarn count, twist per inch, yarn evenness, yarn strength and elongation. After yarn testing, woven fabric was further tested for various physical properties like fabric count, thickness (mm), drape coefficient (cm^2), abrasion loss, bursting strength (kg/cm^2) and thermal conductivity (clo). A proper combination of fibre properties with constructional parameters is quite necessary for designing a value added products which eventually finds market, acceptability and as such contributes to the livelihood security of the people of mountain regions.

With the advent of modernization and globalisation a need has become imperative for India to improve its traditional textiles in order to have access and maintain identity in the international market. The development of rural enterprise is crucial for the achievement of broader objectives, economic empowerment of mountain rural artisans and to contributes in poverty alleviation. Quality processing of merino wool is a key factor for meeting the competition in the market. For quality products, sequential testing and monitoring the processes at each stage are the key parameters. This study tested merino wool fibre at yarn and fabric stages for quality assurance.

METHODOLOGY

Removal of impurities: The sheared fibres were cleaned before mechanical processing. 80 to 90% sand, dust and the vegetable matters up to some extent were removed manually.

Scouring: To scour merino wool the method suggested by Gupta *et al.* (1992) was followed. After scouring, merino wool were rinsed thoroughly with luke warm water. The wet fibres were dried in shade.

Bleaching: Fibres were bleached in order to remove natural colouring matter or to fade / clean any impurity which was present in the fibres using methods by Gupta (2003).

The denier, strength and elongation of merino wool fibres were determined using semi-automatic

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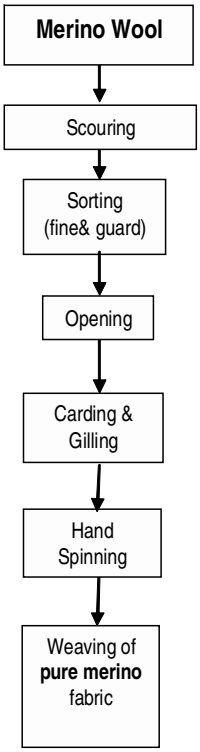
microprocessor 'Fafegraph-M' in joint operation with 'Vibromat-M' (Booth 1996). 'Whiteness Index (WI)' was measured with the help of Hunter-colour lab.



Carding: The carding carries out the task of individualizing and making the fibres parallel. It removes the vegetative matters present in the fibres, which is left even after scouring. The resultant fibres were made into slivers, with least fibre breakage. In carding, merino fibres were passed through a set of drums called the Feed Roller (8.0 cm in diameter), the Licker (25.0 cm in diameter), the Cylinder (130.0 cm in diameter) and the Doffer (69.0 cm in diameter), which were covered with iron spikes in the carding cloth of different thickness and density of spacing. When merino fibre was passed through the carding rollers, fibres were opened up aligned parallel to each other. At the end of carding, pure and blended long, continuous and thick mass of fibres were collected, called as silver. The process of carding was repeated again in order to obtain a uniform sliver with more parallel fibres.

Gilling: Gilling straightens and aligns fibres by drawing them through a bed of pins into the delivery rollers. In doing so, the stock is blended and the sliver uniformity is improved (Gupta *et al.* 1992). Four to six slivers of merino wool fibres was passed through gill box in order to prepare more homogeneous tops for better yarn spinning.

Spinning: The 'khadi' system which is a hand spinning method was used for yarn preparation. It is a unique system having no other requirement and dependence except manpower and small set of machinery. Since spinning is controlled by hand, every yarn number from lowest to the highest possible can be spun which depends on the skill of the spinner. 'Bageshwari charkha' was used for spinning of pure merino wool yarn.

Evaluation of physical properties of yarn

The weaving yarns prepared on 'Bageshwari Charkha was tested for the physical properties viz. yarn count, twist per inch, yarn evenness and yarn strength and elongation. The yarn count of the sample was determined by the formula given by Skinkle (1972). The twist per inch was measured by yarn twist tester (Kamal Metal Industries, Ahemdabad) according to the method described by Skinkle (1972). The evenness of the yarn was determined using the uster evenness tester. It consisted of a device to apply uniform tension in yarn during testing and suitable counter for recording the number of thin, thick places and number of neps present in the yarn. The single strand method of measuring breaking strength and elongation percentage as described by Skinkle (1972) was used.

Preparation of Woven Fabrics: After yarn preparation, yarns were used for fabric formation on handloom. The warp for the shuttle loom was wound on the warping machine. It was transferred to the warp beam under tension, which was then put on the loom for drafting. The warp ends was drafted with a reed hook, the loom tie-ups and tension was readjusted and the loom was geared up for weaving. Fabrics were formed from weaving by interlacing one set of yarns with another set oriented crosswise. Twill weave was used to prepare merino wool fabric. The newly constructed fabric was wound on the cloth beam and warp yarns were released from the warp beams.

Physical properties of pure and blended woven fabrics

After yarn testing, woven fabric (prepared by the pure yarns on Bageshwari charkha) were tested for various physical properties like fabric count, fabric thickness

(mm), drape coefficient (cm^2), abrasion loss, bursting strength (kg/cm^2) and thermal conductivity (clo).

The fabric count of woven sample was determined as per the method given by Angappan and Gopalkrishan (2002). Thickness of each fabric sample was tested as per ISI (IS:7702-1975) method by using shirley's thickness tester. Drape is an important property that decides the gracefulness of a garment as it is related to aesthetics and appearance of the garment. Drape of fabric was determined by using the instrument called drape meter and was expressed in terms of "drape co-efficient". By measuring the following weight, drape co-efficient (F) was calculated as per the method suggested by Angappan and Gopalkrishan (2002). The abrasion resistance of the fabric was calculated by 'martindale abrasion tester' as the loss in weight after repetitive abrasion by using the method described by Booth (1996).

Bursting strength of the samples was measured by applying maximum fluid pressure to a circular specimen, distending it to rupture. "Diaphragm test method" as described by ISI (IS:1966 -1975) was used to determine the bursting strength of the fabric. Sasmira thermal conductivity apparatus was used for comparing the thermal insulation properties of pure and blended fabrics. The apparatus conforms to the standards of Niven's hot plate.

RESULTS AND DISCUSSION

Scouring of merino wool was carried out to remove the impurities present. Approximately 30 per cent of weight loss in the merino wool was observed after scouring. Mathur (2003) reported that the natural impurities present in wool fibre are removed by the action of alkali present in the scouring solution.

Bleaching is a process which improves some of the physical properties of fibres and brings whiteness to the fibre, yarn and fabric using appropriate bleaching agents.

It is evident from Table that the tenacity of merino wool fibres (1.43 gm/d) was almost retained after the bleaching with method1. The table also indicates that negligible reduction in tenacity was found after bleaching. After bleaching, whiteness index was observed 32.30 in merino wool with method 1 (Table 1).

Negligible difference was observed in bleached and unbleached merino wool fibres as far as physical properties are concerned. On the basis of whiteness index (WI) the bleaching could be recommended to fade natural colour of merino wool fibres. Due to the action of bleaching agents, strength of all selected fibres was reduced, whereas elongation percentage was increased. It might be due to the effect of bleaching treatment which might have caused decrease in crystalline region and increase in amorphous region of the fibre.

Keeping in view the reduction in fibre strength after bleaching, higher demand of natural shades and better dye shades obtained on a pure white coloured material, unbleached fibres were used for processing in this study.

Table 1: Physical properties of bleached and unbleached merino wool

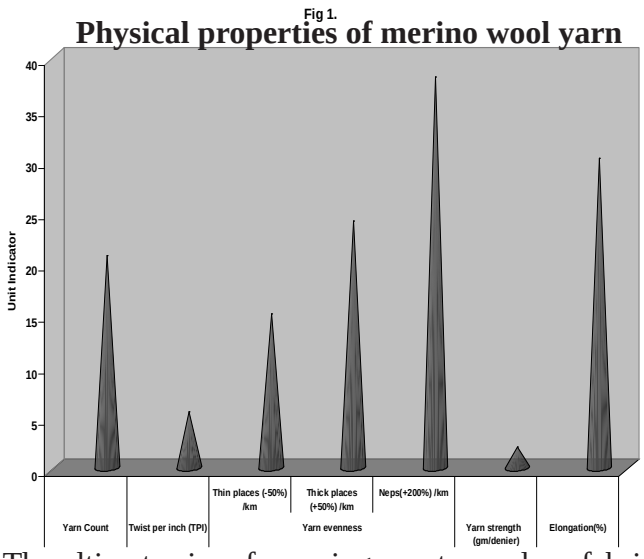
Sample	Elongation (%)	Count (denier)	Tenacity (gm/denier)	Whiteness index readings			
				L	a	b	WI
Unbleached	35.60	3.60	1.44	73.30	-3.40	5.60	30.50
Bleached 1	24.06	1.73	1.43	76.30	-2.13	5.93	32.30
Bleached 2	32.37	2.04	1.31	77.20	-2.90	6.53	30.67

Merino wool fibres were processed to prepare yarns and different steps like antistatic finish, fibre opening and blending, carding, gilling and spinning were applied. The treatment of merino wool fibres with anti-static finish helped in minimizing the static charge during carding. Wool is usually oiled prior to carding in order to reduce electrisation at rubbing. As a result, carding conditions improved the breakage rate in spinning and weaving (Sadov *et al.* 1973).In the process of carding, the thoroughly opened merino wool fibres were carded and made into sliver form. During carding, coarse fibres shed down between carding rollers, leaving merino slivers more smooth and parallel. The main function of this process is to individualize the wool fibres with the help of set of rollers, having iron pins. When wool is fed to the machine, some quantity of wool fibres get entrapped between the pins which fall in the category of soft waste. The coarser fibres fall underneath between the rollers.

Four to six continuously carded slivers were converted into more homogenous and finer sliver by passing through gill box. Patni (2003) reported that gilling straightened the fibre in the sliver, made them more parallel and brought them close together so as to get a regular sliver. The ultimate aim of spinning was to produce yarn of required count which possess good evenness, tensile properties and a minimum number of faults. When fibres were twisted together into yarn the twist provided the force that held the individual fibres together.

For spinning, Bageshwari Charkha was used and single ply weaving yarn was prepared. Merino wool fibre had crimp, which helped in improving cohesion and thus it was easily processed and these yarns could be successfully used for weaving. Kishore (2004) asserted that spun yarn has to be of the right thickness and should have accurate amount of twist so that the fabric produced will have even surface. Twist was primarily introduced into pure yak hair in order to hold the constituent fibres together, giving thereby strength to the yarns. As the twist level in the yarn increased, it became more compact because the fibres in it were held more tightly together, thus giving comparatively a harder feel to the yarn. A fabric produced from a low-twist yarn i.e. pure merino (5.43 TPI) will have a soft handle which is often a desirable property. However, a reduction in twist level will make the yarn weaker and will also allow the constituent fibres to be earlier removed with pilling and abrasion properties of the fabric.Evenness of all pure and blended experimental yarns was measured in terms of thick (+50 per cent) and thin (-50 per cent) places and number of neps (+200 per cent). Fig. 1 indicated that the average value of thin places was observed as 15/km. The average value of evenness at thick places for the same was 24/km and for neps 38/kms. The merino fibre had good number of crimps which helped in improving cohesion of merino wool with yak fibre in the blended yarn, thus, it was easily processed. Much even yarn was prepared from pure merino wool fibres.

Fig 1.

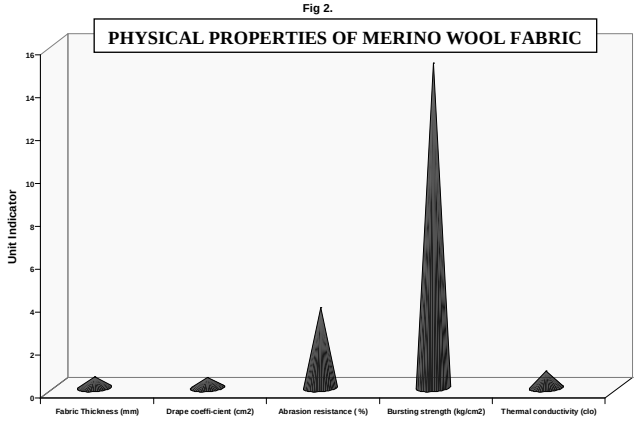


The ultimate aim of weaving was to produce fabric of desired properties and minimum number of faults. The finer the fibre and yarn, the finer fabric could be woven from it. For weaving, 'kumauni' shuttle loom was used and fabric with twill weave was prepared. Twill weaves imparted diagonal lines on

the surface of the fabric. The pure fabrics of merino wool could be made. It was observed that the surface of merino fabric had unique appeal which was further applicable for product formation. After yarn testing, woven fabrics were prepared on handloom and tested for various physical properties. The physical properties of pure and blended fabrics were tested as per their fabric construction (woven fabrics).

Angappan and Gopalkrishnan (2002) reported that in the woven fabric, the warp yarns were referred to as ends. The number of warp threads/inch is called ends/inch. The number of weft threads per inch is called picks/inch. Fabric count is expressed as ends x /inch2. The fabric count of samples was 30 x 30 ends x picks/inch2. It is apparent from Fig.2 that thickness of the woven fabric was 0.51 mm. Angappan and Gopalkrishnan (2002) reported that drape is an important property of textile materials, which allows fabric to orient itself into graceful folds or pleats as a result of force of gravity. Good drapability is a result of interaction between warp way and weft way characteristics. Drape is the ability of a fabric to assume graceful appearance while in use. Drape coefficient of woven fabrics is expressed in cm2. It is evident from the Fig. 2 that drape coefficient value of the samples made from the merino wool was 0.48 cm^2.

Fig 2.



Abrasion resistance Abrasion resistance is the ability of a fibre to withstand repeated distortion and was measured in terms of weight loss. Abrasion loss for the woven fabrics prepared by the merino yarn was 3.73 per cent, (Fig.2).Bursting strength is the strength of a fabric against a multidirectional flow of pressure (Angappan and Gopalkrishnan, 2002). The bursting test measured the strength of both warp and weft yarns simultaneously and indicated the extent to which a fabric can withstand a bursting type of force with the pressure being applied perpendicular to the surface of the fabric. This is an alternative method of measuring strength. It is explicit from Fig.2 that the bursting strength for the woven fabrics was 15.12 kg/cm^2.Crimped fibres tend to be more resilient and have increased bulk, cohesiveness and warmth. Cohesion is the ability of fibre to cling together (Tortora, 1978). It is evident from the Fig.2 that the thermal conductivity (clo) of woven fabrics prepared by the merino wool yarn was 0.84 clo.

CONCLUSION

Fabric quality evaluation is a very complex task. The fibre, yarn parameters, constructional parameter, etc. plays an important role in making a fabric of worth. In fibre parameters, the type of wool used, its length, fineness, strength etc. all affects the visual appeal whereas constructional parameters affect the comfort properties i.e. warmth, drape strength. Therefore a proper combination of fibre properties with constructional parameters is essential to obtain the designed value added product. Diversification of product base using merino wool covers quality assurance, blending with other natural & synthetic fibres, design inputs for different loom based applications etc. Value addition in the form of quality assurances for the products of handloom woolens and hand spun and hand woven khadi will have a real financial upliftment for the artisan by way of higher consumer preference. Through these steps quality processing of merino wool, attractive fabric may be produced which in turn fetch high market price. This will improve the livelihood of mountain people.

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Development and Quality Evaluation of Iron Rich Biscuit Mixes Using Finger Millet

*** Pragya Singh and **Sarita Srivastava**

Abstract

Iron deficiency anemia is a major public health problem affecting numerable people throughout the globe. Finger millet is amongst the major crop of Uttaranchal and is rich in calcium and iron. So the present study was undertaken with the objective to develop convenience mixes rich in iron for biscuits using finger millet along with either locally grown food items or fortifying with suitable chemicals. The mixes were studied for nutritive value viz. proximate composition, in vitro protein digestibility, calcium, iron, phosphorus, in vitro iron bioavailability and antinutrients. The storage stability of mixes was evaluated by sensory evaluation, bacterial and fungal counts. The biscuits were studied for proximate composition, sensory quality and acceptability. The results led to the conclusion that finger millet upto 70 % can be incorporated to formulate iron rich biscuit mix. These biscuits mixes were nutritious (crude protein in range of 10.90-24.14%, crude fat 0.30-3.70%, tatal ash 0.60-4.70%, iron 24.07 mg %, in vitro iron bioavailability 22.68-42.00 %, calcium 22.00-552.37 mg% and phosphorous 119.80-372.30 mg. these mixes were low cost, acceptable at laboratory and field level. These mixes also had good storage stability. These mixes can be used successfully in supplementary feeding programmes.

Nutritional well being is a sustainable force for health and development and maximization of human potential. The nutritional status of a community has been recognized as an important indicator of national development. In other words, malnutrition is an impediment in national development and hence assumes the status of national problem.

Iron deficiency anemia is one of the common nutritional problems affecting millions of people in both developing and developed countries. There is substantial evidence that anemia in children is associated with decreased physical and mental development, impaired immune function and reduced capacity of leucocytes to kill microorganisms. Anaemia is a major nutritional problem, affecting 20-70 % of the population in various countries.

Finger millet *(Eleusine coracana)* is amongst the major crop of Uttaranchal agriculture. Finger millet grain is highly nutritious, being richer in protein, fat and minerals especially calcium and iron than rice and wheat. The present study was undertaken with the objective to develop iron rich biscuit mixes using finger millet, to assess the nutritive value and storage stability of the mixes. Development of biscuits using these mixes and to assess the nutritive value and acceptability of the biscuits both at laboratory level and field level.

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METHODOLOGY

Finger millet variety VL-204 was procured from V.P.K.A.S., Almora (Uttaranchal), soybean PK-1042 was procured from C.R.C., G.B.P.U.A.&T., Pantnagar (Uttaranchal). Refined wheat flour, mint leaves and ferrous sulphate tablets were procured from local market of Pantnagar.

Preparation of raw material for preparing biscuit mixes

Finger millet grains were cleaned, washed and dried in an oven at 50-60ºC for 3-4 h. These were then ground to flour and were passed through 100 mesh sieve. Soybean was soaked for 5 to 6 h to remove its outer covering so as to retard the development of off flavour in the products. Outer covering of soybean was removed by scrubbing the grains between the palms of the hands to obtain a product with better quality characteristics. The seeds were blanched for 5 min and dried in hot air oven at 50ºC for 24 h. The grains were then ground to flour in an electric grinder. The flour was passed through 100 mesh sieve. Mint leaves were washed and spread uniformly on trays lined with newspaper and dried in shade. The dried leaves were ground to powder in an electric grinder. The prepared powder was passed through 40 mesh sieve.

Iron rich biscuit mix (IBM)

Four types of convenience mixes were formulated in this category with varying proportion of finger millet flour (VL-204) ranging from 50 to 70 %. The amount of soybean flour and mint leaf powder was constant in all the mixes. The refined wheat flour was used as filler.

Ingredients (g) used for preparation of IBM

Ingredients	IBM_1	IBM_2	IBM_3
Finger millet flour	50	60	70
Soybean flour	20	20	20
Mint leaf powder	10	10	10
Refined wheat flour	20	10	0

On the basis of sensory evaluation the most acceptable mix was chosen and its iron content was determined. Based on the amount of iron present in the mix, two controls were formulated as shown below:

	Finger millet flour (g)	Refined wheat flour (g)	Fe_2SO_3 (g)
$CIBM_1$	70	30	0.1337
$CIBM_2$	0	100	0.1468

Standardization and preparation of biscuits using above convenience mixes

Biscuits were developed by using the standard method given by Whitley (1970).

Ingredients	Amount
Convenience mix	64 g
Sugar	18 g
Oil/ Hydrogenated fat	16 g
Skimmed milk powder	1.0 g
Glucose	1.0 g
Ammonium bicarbonate	0.5 g
Common salt	0.4 g
Baking powder	0.3 g
Sodium bicarbonate	0.2 g
Vanilla essence	Few drops
Water	As desired

Sugar, fat and vanilla essence were creamed in a mixer. To this, a well mixed blend of convenience mix, skimmed milk powder and baking powder was added along with water containing glucose, common salt, ammonium bicarbonate and sodium bicarbonate. The contents were mixed for 2 min to make the dough of desired consistency. Using a wooden rolling pin, the dough was sheeted to a uniform thickness of 2.5 mm. Biscuits were cut using biscuit mould and baked for 9-10 min at 200ºC in a baking oven.

Sensory quality of Biscuits

To fine out the most acceptable biscuits sensory quality attributes viz. colour, flavour, texture, appearance and overall acceptability were studied by score card method (Amerine *et al.*, 1965). The products, which scored highest from each category, were selected for determination of nutrient composition.

Determination of nutrient composition of convenience mixes

Proximate principles i.e moisture, crude protein, crude fat, crude fibre, total ash (AOAC, 1995), carbohydrates by difference, physiological energy was calculated, calcium (AOAC, 1975), phosphorous (Fiske and Subba Row as given in Ranganna, 1986), iron (Wong's method as given by Ranganna, 1986), tannins (Price *et al.*, 1978) and phytates (Haug and Lantzsch, 1983), *In vitro* protein digestibility (Akeson and Stahman, 1964) and *In vitro* iron bioavailability (Rao and Prabhavati, 1978) were determined in selected biscuit mixes. All the estimations were done in triplicate and reported on dry weight basis.

Cost of biscuit mixes

Cost of biscuit mixes was calculated using the current cost of ingredients. Labour cost at the rate of Rs. 500 per month has also been included while calculating the cost of mixes.

Evaluation of storage stability of the mixes

Storage stability of biscuit mixes was evaluated by studying the fungal count (APHA, 1976) and total bacterial count (APHA, 1976) of the mixes. A 300 g of dry mix was stored in duplicate, in pearl pet plastic jars (air tight containers) of 500 g capacity at room temperature (20°C-35.6°C) for a period of three months (28th March to 28th June, 2005). The samples were drawn at one month interval and studied.

Sensory evaluation after storage

The biscuit were prepared using stored convenience mixes and evaluated for sensory quality by nine point Hedonic scale as mentioned above. The scores obtained for biscuits which were prepared from fresh convenience mixes and stored convenience mixes were compared.

Acceptability of food products

All the food products with good sensory quality were evaluated for acceptability at field level. A total of 50 subjects consisting of adult males, females and children were included in sensory panel in field trials. These subjects belonged to the hill community of Uttaranchal. All of them lived at Pantnagar (Jha colony and *Chakphere* colony) and were selected purposively. Subjects were asked to taste the food products and rank it on nine-point Hedonic scale.

RESULTS AND DISCUSSION

Iron rich biscuit mixes were formulated using finger millet along with either mixing with locally grown foodstuffs or fortifying it with Fe_2SO_3. Similarly control mix was also formulated by fortifying refined wheat flour with Fe_2SO_3.On the basis of the results obtained by using Score card method it was observed that IBM_3 had significantly higher ($p<0.05$) mean scores for taste (7.00), flavour (7.70), texture (7.60), appearance (7.20) and overall acceptability (7.80) in comparison to IBM_1 and IBM_2 (Table 1).So from now onwards it would be termed as selected iron rich biscuit mix (SIBM).

Nutritive value of convenience mixes

All the mixes were analyzed for nutritional factors and antinutritional factors and the results are presented in table 2. SIBM had moisture, crude protein, crude fat, total ash, and crude fibre content of 8.78, 24.14, 4.43, 4.70 and 3.70 %, respectively. Carbohydrate content was 54.24 % and physiological energy content was 353 Kcal / 100 g. The value of *in vitro* protein digestibility was 60.28 %. Iron,

calcium and phosphorus were 24.07, 552.37 and 372.30 mg / 100 g while ionisable iron was 894 ìg / 100 g. The tannins and phytate contents were 144.46 and 98.85 mg / 100 g, respectively. (Table 4.14).

The mix $CIBM_1$ had crude protein, crude fat, total ash, and crude fibre content of 7.59, 10.90, 0.98, 1.28 and 1.20, respectively. Carbohydrate content was 78.05 % and physiological energy content was 364 Kcal / 100 g. Iron, calcium and phosphorus were 24.07, 289.90 and 209.80 mg / 100 g. The value of *in vitro* protein digestibility was 64.76 % of crude protein while *in vitro* iron bioavailability was 38.48 % and ionisable iron was 1228 ìg / 100 g The tannins and phytate contents were 134.24 and 106.25 mg / 100 g, respectively..

The mix $CIBM_2$ had crude protein, crude fat, total ash, and crude fibre content of 7.62, 11.00, 0.85, 0.60 and 0.30, respectively. Carbohydrate content was 79.63 % and physiological energy content was 370 Kcal / 100 g. Iron, calcium and phosphorus were 24.07, 22.00 and 119.00 mg / 100 g. The value of *in vitro* protein digestibility was 78.24 % of crude protein while *in vitro* bioavailability was 42.00 % and ionisable iron was 1514 ìg / 100 g. The tannins and phytate contents were 32.89 and 35.74 mg / 100 g, respectively.

When the nutritive value of SIBM, $CIBM_1$ and $CIBM_2$ was compared it was observed that SIBM had significantly higher moisture, crude protein, crude fat, total ash, crude fibre, calcium and phosphorous as compared to $CIBM_1$ and $CIBM_2$. $CIBM_1$ had significantly higher phytate content as compared to SIBM and $CIBM_2$. *In vitro* iron bioavailability and ionisable iron content of $CCBM_2$ was significantly higher when compared with SIBM and $CCBM_1$. The iron content in all the three mixes was *at par*.

The high crude protein content of SIBM has been mainly contributed by soybean flour and mint leaf

Table 1: Nutritive value of iron rich biscuit mixes

	SIBM	Control ($CIBM_{1)}$	Control ($CIBM_2$)	Mean	CD at 5 %
Moisture (%)	8.78±0.22[b]	7.59±0.14[a]	7.62±0.36[a]	7.99	0.34
CrudeProtein (%)	24.14±0.16[b]	10.90±0.30[a]	11.00±0.25[a]	15.34	1.15
Crude Fat (%)	4.43±0.48[b]	0.98±0.75[a]	0.85±0.40[a]	2.08	0.11
Crude fibre (%)	3.70±0.23[c]	1.20±0.15[b]	0.30±0.22[a]	1.73	0.11
Total ash (%)	4.70±0.21[c]	1.28±0.50[b]	0.60±0.50[a]	2.19	0.11
Carbohydrate (%)	54.24±0.76[a]	78.05±0.90[b]	79.63±0.33[c]	70.64	0.16
Physiological energy (Kcal/100g)	353±1.52[a]	364±1.27[a,b]	370±3.20[b]	362	11.51
In vitro protein digestibility (% crude protein)	60.28±1.80[a]	64.76±1.48[a]	78.24±0.75[b]	67.76	6.91
Iron (mg %)	24.07±0.15	24.07±0.20	24.07±0.10	24.07	-
Ionizable iron (µg %)	894±0.99[a]	1228±1.44[b]	1514±2.30[c]	1212	34.55
In vitro iron bioavailability (%)	22.68±0.13[a]	38.48±0.25[b]	42.00±0.25[c]	34.38	3.25
Calcium (mg %)	552.37±0.90[c]	289.90±1.47[b]	22.00±1.30[a]	288.09	25.75
Phosphorous (mg %)	372.30±0.90[c]	209.80±0.25[b]	119.000.80±[a]	233.70	11.52
Tannins (mg%)	144.46±11.99[b]	134.24±14.86[b]	32.89±11.20[a]	93.89	11.51
Phytates (mg %)	98.85±2.48[b]	106.25±3.45[c]	35.74±5.82[a]	80.28	4.60

Means followed by different letters in column differ significantly at 5% level of significance.

powder. Mint leaf powder had high amount of crude protein, total ash, crude fibre, calcium and phosphorus. The mint leaf powder is a source of nutrients because 100 g of fresh leaves were dehydrated and concentrated to 8.57 g of powder. The *in vitro* iron bio availability and ionisable iron content of $CIBM_2$ was higher than $CIBM_1$ and SIBM. The $CIBM_2$ contained low amounts of tannins and phytates as antinutritional factors readily forms complexes with multivalent cations and proteins and made them unable to the body. (Haug and Lantzsch, 1983).

Sensory quality evaluation of the products by score card method

The mean scores for sensory quality characterstics of iron rich biscuits have been presented in Table 4.18. The biscuits $CIBM_2$ had significantly higher ($p<0.05$) values for colour (8.22), taste (8.33), flavour (8.12), texture (8.29), appearance (8.50) and overall acceptability (7.97) when compared with SIBM and $CIBM_1$.

Cost of convenience mixes

The cost of SIBM, $CIBM_1$ and $CIBM_2$ were Rs.58 / Kg, Rs.24 / Kg and Rs. 28 / Kg, respectively. The cost of iron biscuit mix prepared from locally available food items (SIBM) was high as it contains mint leaf powder which is costly (Rs. 37 / 100 g).

The mixes SIBM, CIBM1, CIBM2 had initial bacterial count of 0.38×10^2, 0.20×10^2 and 0.24×10^2 bacteria per g samples respectively which increased significantly ($p<0.05$) up to 5.96×10^2, 4.70×10^2 and 4.86×10^2 bacteria per g sample, respectively after 3 months of storage. The above results showed that storing convenience mixes at room temperature led to an increase in total bacterial count. However the total bacterial count of all the convenience mixes, initially as well as during storage has been found to be quite low as compared to the permissible limit of 10^5 given by Bureau of Indian standards (IS: 7463, 1988).

In all the biscuit mixes, namely SIBM, $CIBM_1$, $CIBM_2$ moulds were not detected initially and also when stored for 3 months at room temperature.

Sensory quality of the developed biscuits after storage of convenience mixes

The results showed that the control biscuits viz. SIBM, $CIBM_1$, $CIBM_2$ showed a non significant difference ($p>0.05$) in sensory scores when prepared from fresh and stored mixes. The above results on sensory quality lead to the conclusion that all the food products were found acceptable after 3 month of storage at room temperature. The products showed the preference rating of like very much or like moderately accept for SIBM which had mean sensory score of 6.9 after storage for 3 months (like slightly).

Table 2: Sensory quality characterstics of iron rich biscuits (IBM)

Biscuits	Colour	Taste	Flavour	Texture	Appearance	Over all acceptability
IBM_1	6.95	6.70*	6.70*	6.80*	6.80	6.95*
IBM_2	6.90	6.90*	7.10*	6.80*	7.00	7.10*
IBM_3	7.50	7.00*	7.70*	7.60*	7.20	7.80*
SEM±	0.173	0.214	0.188	0.244	0.188	0.189
CD at 5 %	0.504	0.621	0.547	0.708	0.547	0.550

*significant at 5 per cent.

Acceptability of food products prepared using convenience mixes

Iron rich biscuits SIBM, control $CIBM_1$ and $CIBM_2$ had mean sensory scores of 7.60 (like moderately), 7.50 (like moderately) and 8.50 (like very much), respectively. The results showed that all the biscuits were acceptable at field level. On comparing the sensory scores of the biscuits at laboratory and field level it was concluded that the iron rich biscuits (SIBM) had non significant ($p>0.05$) different sensory scores of 7.90 ± 0.67 at laboratory level and 7.60 ± 1.14 at field level. The biscuits (SIBM) were like moderately both at laboratory and field level. $CIBM_1$ showed the sensory scores of 7.16 ± 0.32 and 7.50 ± 0.56 at laboratory and field level, respectively. However, the differences in the sensory scores were non significant ($p>0.05$).The control biscuits, $CIBM_1$ was like moderately at laboratory and field level. The control biscuits ($CIBM_2$) scored 8.00 ± 0.44 (like very much) at laboratory level and 8.50 ± 0.36 (like very much) at field level. Statistically significant ($p<0.05$) differences were found between at laboratory and field sensory scores.

CONCLUSION

The study leads to the conclusion that finger millet upto 70% can be successfully incorporated to formulate iron rich biscuit mixes. These mixes are low cost, nutritious, had good storage stability and were acceptable at both laboratory and field level. These mixes can be successfully used for supplementary feeding programmes.

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Mental Health of the Rural Adolescent Girls of Rajasthan

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Abstract

Mental health of 150 adolescent girls (11-18 years) from Udaipur was assessed and found to be poor. Component-wise analysis revealed poor scores in positive self-evaluation, perception of reality, integration of personality, group oriented attitudes and environmental mastery. In autonomy component, however, it was found to be average.

The preamble of the World Health Organization's charter defined health as a state of complete physical, mental and social wellbeing, not merely the absence of disease or infirmity. Mental health has been reported as an important factor influencing individuals' various behaviours, activities, happiness and performance. Bhatia (1982) considers mental health as the ability to balance feelings, desires, ambitions and ideals in one's daily living. It means the ability to face and accept the realities of life. Adolescence is characteristically an significant period in the life span during which keeping balanced mental health is of importance. The present study aimed to assess the mental health of rural adolescent girls.

METHODOLOGY

The present study was conducted in five villages of Udaipur district in Rajasthan, namely Bhoio Ki Pancholi, Dangio Ki Pancholi, Paraphet, Kanpur Kheda and Kharbadia. The villages were adopted under All India Coordinated Project in Home Science run at College of Home Science, MPUAT, Udaipur.

The total sample consisted of 150 adolescent girls (30 from each village) belonging to the age group of 11-18 years which were selected randomly.

A standardized tool, Mental Health Inventory (M.H.I.) developed by Jagdish and Srivastava (19…..) was used for data collection. The inventory consists of 54 items related to 6 dimensions of mental health i.e., positive self-evaluation, perception of reality, integration of personality, autonomy, group oriented attitudes and environmental mastery. Each statement had 4 alternative responses i.e., always, most of time, sometimes and never, which were scored 4, 3, 2 and 1 respectively. Data collection was done through interview. Analyzed by calculating mean, standard deviation and frequency distribution.

RESULTS AND DISCUSSION

Table 1: Mental health scores of rural adolescent girls N = 150

Dimensions	Range of Scores	Mean	S.D.
Positive self evaluation	17-26	21.52	2.51
Perception of reality	16-23	19.03	1.76
Integration of personality	27-34	30.70	2.26
Autonomy	13-18	15.84	1.35
Group oriented attitudes	20-28	24.04	1.69
Environmental mastery	16-24	20.53	2.21
Overall	119-142	131.64	5.10

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Overall mental health mean score of 131.64 shows poor mental health of girls. It means their ability to make positive self-evaluation, to perceive the reality, to integrate the personality, autonomy, group oriented attitudes and environmental mastery is less and their environment is not fulfilling the three important requirements of mental health, i.e., full expression, harmonization and the direction to a common end of girls' native and required potentialities. It may be because of the various personal, social and environmental factors like their age, low educational status, strict social norms for them, gender discrimination and lack of opportunities to express themselves etc. which were observed during study.

Component-wise analysis of girls mental health reveals that respondents had very poor health in positive self-evaluation dimension which includes self-confidence, self-acceptance, self-identity, feeling of worthwhileness and realization of one's potentialities. Reasons may be their socialization, lack of opportunities and inherent vulnerability during adolescence.

Perception of reality dimension of mental health is related to perception free from need distortion, absence of excessive fantasy and a broad out look on the world. Mean score of girls in this dimension shows very poor health status. Trend of poor status was observed in case of integration of personality dimension also with mean score 30.70. This dimension indicates balance of psychic forces in the individual and includes the ability to understand and to share other people's emotions, the ability to concentrate at work and interest in several activities. It may be because of the lack of opportunities to build positive traits, work over load and monotony of different activities. Sanwal *et al.* (2006) also reported that 48.33 per cent adolescent girls had poor and 31.66 per cent girls had very poor health in this dimension. In their study only 20 per cent had average health in integration of personality dimension.

Autonomy component of mental health includes stable set of internal standards for one's action, dependence upon own potentialities for own development rather than dependence on other people. Mean score of this component shows that health status of girls was better in comparison to other components of mental health as girls showed average health. It means girls are normally mastering their developmental task of achieving autonomy, but still there is need for improvement in this aspect.

Group oriented attitudes of girls were also measured which is associated with the ability to get along with others, work with others and ability to find recreation. Mean score i.e., 24.04 depicts poor group oriented attitudes indicating a need for increase in group participation. Poor status was also seen in case of environmental mastery of girls with mean score 20.53 which means their efficiency in meeting situational requirements, ability to work and play, ability to take responsibilities and capacity for adjustment was less. It again may be because of lack of opportunities, guidance, role models and gender discrimination which is usually observed in rural areas.

Table 2: Frequency distribution of rural adolescent girls in view of their mental health levels N=150

Categories	Frequency
Very good	0
Good	0
Average	0
Poor	69
Very poor	81
Total	150

Rural adolescent girls were categorized into five categories ranging from very good to very poor on the basis of their scores obtained on mental health aspect. All respondents had poor mental health.

CONCLUSION

Overall mental health of rural adolescent girls and in majority of its components was found to be poor. So there is a dire need for efforts through interventions and trainings to improve their mental health and also changes are required in attitudes, practices and environment. Also mastery of required skills is needed so girls can enjoy good mental health.

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Occupational Health Hazards Among Textile Mill Workers

Sudha Babel and Renu Bala

Abstract

Occupational health is every body's business, every one is affected by it, directly or indirectly. The textile industry is one of the occupation which affects health of workers, especially the spinning and weaving section. A research study was conducted to assess occupational health hazards of workers. Results reveal that the condition of the workers was alarming and they were facing several physical and mental health problems which in turn reduced their work efficiency.

Health has been defined as a state of complete physical, mental and social well being. The general health of the people is related with occupation in which they are engaged. The textile industry is the second largest industry after agriculture and one of the occupation which affects health of workers. Cotton industry workers are exposed to various hazards in the different department of textile factories. The air in the cotton mill was thick with cotton dust which could lead to byssionosis- a lung disease. Eye inflammation, deafness, tuberculosis, cough, asthma could be attributed to the working conditions in the mill. Thus there is need to have a look on the occupational health of textile mill workers so that they can remain healthy and perform the task carefully. The objective of the study was to find out the occupational health hazards (physical and mental) faced by the textile mill workers, their causal factors and preventive measures taken by the respondents.

METHODOLOGY

This study was conducted in Textile Mill of Sri Ganganagar district of Rajasthan. A sample size of 160 workers, working from last 10-15 years in the same mill and in the age group of 35-40 years, was selected from spinning and weaving departments. Then their Body Mass Index was calculated by the formula BMI (kg/m2)= weight(kg)/height (m2) (Garrow 1987). A sub sample of 120 respondents was selected with poor nutritional status as majority were found to be in chromic energy deficiency grade. Pre tested structured interview schedule and interview method was used for collection of data and it was statistically analysed using frequencies and percentages.

RESULTS AND DISCUSSIONS

Assessment of occupational health hazards of Textiles mill workers was done on:

* Physical health hazards
* Mental health hazards

Physical Health Hazards: These include workplace hazards due to continued exposure to dust, heat, cold, light, noise, vibration, ultra violet radiation and ionizing radiation resulting in diseases of lungs, eyes, skin, ears and injuries.

Lung diseases

All the respondents reported that dust is responsible for diseases like cough, asthma, increased respiration, chest tightness and tubular cleanses and they take medical treatment for prevention of these diseases (Table 1). The results of the present study are in tune with Ahasan *et al.* 2000 conducted among textile mill workers in Bangladesh.

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Table 1: Percentage distribution of respondents by lung diseases, causal factors and preventive measures taken by the respondents N = 120

S. No.	Lung diseases	Total % of sufferers	Causal factors			Preventive measures	
			Dust	Age	Working conditions	Visit to Doctor	Washing with water
1.	Cough	40.00	100.00	3.57	100.00	33.93	-
2.	Asthma	25.00	100.00	3.57	100.00	-	2.08
3.	Increased respiration rate	20.84	100.00	-	100.00	14.17	40.56
4.	Chest tightness	0.83	100.00	100.00	100.00	-	-
5.	T.B.	8.33	100.00	29.17	100.00	-	-

Table 2: Percentage distribution of respondents by eye diseases, causal factors and preventive measures taken by the respondents N = 120

S. No.	Eye diseases	Total % of sufferers	Causal factors			Preventive measures	
			Dust	Age	Working conditions	Visit to Doctor	Washing with water
1.	Swelling	5.00	90.00	-	30.00	90.00	20.00
2.	Weak eyesight	23.34	83.75	46.39	40.35	94.45	48.34
3.	Burning of eye	40.00	93.33	3.70	57.72	76.33	69.50

Table 3: Percentage distribution of respondents by skin diseases, causal factors and preventive measures taken by the respondents N = 120

S. No.	Skin diseases	Total % of sufferers	Causal factors		Preventive measures	
			Dust	High temperature in summer	Visit to Doctor	Any other with water
1.	Rashes on skin	26.66	100.00	23.11	100.00	-
2.	Itching on skin	33.33	100.00	12.69	100.00	-

Table 4: Percentage distribution of respondents by ear diseases, causal factors and preventive measures taken by the respondents N = 120

S. No.	Ear diseases	Total % of sufferers	Causal factors		Preventive measures	
			Dust	High temperature in summer	Visit to Doctor	Any other with water
1.	Secretion	8.33	100.00	-	100.00	-
2.	Pain in ear	10.00	100.00	-	100.00	-
3.	Hearing problem	19.17	100.00	-	100.00	-

Table 5: Percentage distribution of respondents about problem due to noise and remedial measures taken by the respondents

N = 120

S.No.	Problems due to noise	Total % of sufferers	Preventive measures Visit to Doctor	Rest
1.	Headache	93.33	100.00	90.46
2.	Nausea	16.67	45.00	80.00
3.	Irritation	11.67	8.33	95.83
4.	Hypertension	39.17	100.00	33.00

Table 6: Percentage distribution of respondents by injury faced by the respondents

N = 120

S.No.	Statement	Total
1.	Did you have injury during work	
	a. Yes	50.83
	b. No	49.17
2.	If yes which type	
	a. Major	6.53
	b. Minor	93.47

Table 7 : Percentage distribution of respondents about mental problems experienced by them and reasons there of

N = 120

S. No.	Opinion	*Total (%)	Reasons	*Total (%)
1.	No problem	2.50	-	-
2.	Worry/tension	97.50	-Low pay scale	97.44
			-Family problems	81.20
			-Working condition	40.17
3.	Boredom	22.50	-Working condition	100.0

Eye Diseases

Burning of eyes, weak eyesight and swelling of eyes were the mostly diseases and dust was the main cause. Majority of respondents had to take medical treatment while some wash the eyes with water to prevent these diseases (Table 2).

Skin Diseases

Itching on skin was found in one third of respondents and dust was attributed as the main (Table 3). Similar views were reported by Khare (1990) that the most common reasons for skin diseases were the working environment of the industry, various chemical substances used in it and its waste products.

Ear Diseases

Excessive noise was one of the reasons for ear diseases (Table 3). The findings of the study are in tune with Belachew and Barhane 1994 who studied the prevalence of and risk factors for noise – induced hearing loss in Dire-Dawa textile factory.

Problems Due to Noise

Excessive noise also resulted in cases of irritation, hypertension and nausea. The reason behind this is increased noise level in spinning and weaving department. All the respondents take medical treatment for prevention of headache and hypertension and majority of respondents (85%) take rest for prevention of nausea and irritation (Table 5). Mladehovaski 1990 also reported that the rate of hypertension among textile workers. It was more frequent among people with a hereditary predisposition for arterial hypertension and who were over 40 years old and over weight.

Injury Faced by Workers in the Mill

It was found that half of the total workers had injury during work. Among them 93.47 percent respondents faced minor injury (wound on finger, hand, feet, etc.) and rest (6.53%) had major injury (hand injury, loss of hand or fingers) (Table 6). Results of the study are in line with (Chinla *et al.* 1995).

Mental Health Hazards

Table 7 indicates that only 2.5 percent respondents had no mental problem. Majority of respondents suffered from tension/worry due to low pay scale, family problems and working conditions. Boredom was also faced by respondents due to working condition. The result of the present study is in tune with Agrawal (1985) who reported that working conditions caused disinterest among workers towards their job, more working hours caused mental pressure and resulted in fear of accidents while working.

CONCLUSION

Working conditions of textile mill workers are alarming. Physical health hazards like cough, asthma, T.B., increased respiration rate, itching on skin, burning of eyes, headache, nausea, irritation, hypertension, pain in ear and hearing problem etc. were found to be result of in appropriate working conditions. These are detrimental to workers health and reduce their efficiency at work.

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A Study of Organizational Communication in the Effectiveness of Dairy Cooperatives

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Abstract

An efficient management of an organization can be ensured only when importance of communication in organizational effectiveness is given due consideration. Keeping this in view, the present investigation was designed to study different facets of organizational communication viz., direction of communication flow, and find out their relationship with the organizational effectiveness. The study was conducted in Uttar-Pradesh Dairy Co-operative set-up. In U.P., Pradeshik Co-operative Dairy Federation Limited (PCDF). Communication received from colleagues was found to more than that of sent to the colleagues. Through the relational statistics, it can be inferred that with an increase in upward communication with the superiors, the effectiveness of SMB could be enhanced.

Organizational communication occurs within an organization and between the organizations and its environment. It is distinct from other types of human communication in the sense that it occurs in highly structured setting (Rogers *et. al.*, 1976). The communication system of an organization is an increasingly powerful determinant of the organizational effectiveness and it may have a limiting effect on the ability of the organization to grow, to perform efficiently or to survive (France *et al.*, 1977). An efficient management of an organization can be ensured only when importance of communication in organizational effectiveness is given due consideration. Keeping this in view, the present investigation was designed to study different facets of organizational communication viz., direction of communication flow, and find out their relationship with the organizational effectiveness.

METHODOLOGY

The study was conducted in Uttar-Pradesh Dairy Co-operative set-up. In U.P., Pradeshik Co-operative Dairy Federation Limited (PCDF) was made an implementing agency of operation flood programme in 32 districts. In remaining districts U.P.State Milk Board (SMB) was entrusted with the responsibility of Dairy Development following Anand Pattern Co-operative model. Thus, the entire state has been brought under Anand Pattern under the administrative control of these two organizations. In present study comparisons were drawn between SMB and PCDF in respect of dimensions of organizational communication and organizational effectiveness.

Keeping in view the three-tier structure of U.P.Dairy Co-operative set-up, the sampling design of the study was comprised of three different hierarchical levels vis., head office at apex level milk union at district level and diary co-operative society at village level. In PCDF, the composite sampling size comprising of all three levels came to 99. In SMB, total sample size of the respondents was numbering 85. The data were collected with the help of well structured interview schedule.

The studied dimensions of the organizational

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communication is the direction of communication flow in the organization which has been operationalized in terms of vertical (downward and upward) and horizontal communication. The responses were recorded considering the extent and frequency of work related contract and communication on five point continuum. Organizational effectiveness was measured with the help of instrument developed by Mott, P.E.(1972) consisting of eight items pertaining to different criteria of organizational effectiveness viz. Productivity, adaptability and flexibility.

Findings indicated that the amount of downward communication was higher than that of upward communication in both the organizations at all the levels.

RESULTS AND DISCUSSION

Organizational communication

The formal communication system of an organization generally provides for vertical and horizontal communication flows. The vertical communication comprising of downward (Top to Bottom) and upward (Bottom to top) which occurs between superior and subordinates has been studied. Besides, horizontal communication taking place between colleagues or individuals of the same rank has also been studied. The flow of communication amount superiors, subordinates and Colleagues in both the organizations at their different levels has been depicted in Table 1.

Means across the row within and between the organizations bearing different superscripts are

significantly different .

The amount of downward communication was higher than that of upward communication in both the organizations at all the levels (Table 1). This is in consonance with the findings of Ansari (1990) who reported more amount of downward communication than that of upward communication with superiors in the department of Animal Husbadry. On the whole, the lower extent of upward communication with superiors as compared to downward communication in SMB and PCDF might be on account of poor subordinate's responsiveness, lower level of subordinate's involvement in decision making and planning and also due to lack of

Table 1: Direction of Communication flow at different levels of the organizations (Mean score)

Direction of Communication	SMB				PCDF			
	Head Office	Milk Union	D.C. Society	Total Office	Head Union	Milk Society	D.C.	Total
Upward Comunication	10.73 a	15.32b	11.62a	12.77A	8.71a	12.76b	11.20b	10.00B
With superior	+1.05	+0.88	+0.51	+0.49	+0.43	+1.55	+0.93	+0.44
Downward Communication	13.63a	17.00b	11.65a	14.04A	9.12a	14.53b	14.66b	11.51B
From superior	+1.33	+1.01	+0.62	+0.59	+0.52	+1.90	+1.82	+0.72
Upward Communication	12.15a	14.06a	-	13.34A	10.85a	14.46 b	-	11.53A
From subordinate	+2.32	+1.08	-	+1.10	+0.72	+1.40	-	+0.66
Downward communication	12.89a	16.90b	-	15.38A	12.28a	16.92	-	13.97A
With subordinate	+1.37	+1.16	-	+0.92	+0.76	+1.55	-	+1.07
Communication sent	7.36ab	9.90a	6.91b	8.10A	5.32a	7.84b	7.44b	6.28B
To colleague	+1.92	+0.95	+0.30	+0.57	+0.29	+0.46	+0.42	+0.24
Communication Received	8.31a	10.06a	7.62a	8.68A	5.64a	7.84ab	11.00b	7.55A
From colleague	+2.45	+0.97	+0.37	+0.67	+0.32	+0.59	+2.80	+0.89

encouragement for feedback communication with superiors. The upward communication with superiors was found to be significantly higher at the milk union level in both the organizations. It is needless to mention here that adequate feedback through upward communication is vital for proper planning, decisions making and problem solving at the higher level of the organizations. At the union level, more amount of feedback were received by superiors. Lower score of upward communication at head office level in SMB and PCDF reflected inadequate feedback communication received by the top officials at the apex level.

The higher degree of downward communication with subordinates in SMB as compared to that of PCDF highlights the bureaucratic tendency wherein too much emphasis is given on instructive communication like other government organizations. The higher extent of downward communication at milk union level is indicative of the fact that maximum amount of instruction, order, directives, plans, policies, and programmes are received at this level from the head office.

The horizontal communication was studied in terms of communication exchanges among colleagues. Communication received from colleagues was found to more than that of sent to the colleagues. The reason for the higher degree of communication received from the colleagues might be on account of general tendency of organizational incumbents to seek more information from their colleagues rather than giving them in course of communicative exchange.

Relational Analysis

In order to study the relationship of independent variables with the organizational effectiveness in both the organizations viz. SMB and PCDF, the correlation coefficients were computed and tested for their statistically significant. The correlation coefficients of independent variables which were found to be significant in either organization have been given in Table 2.

The correlation co-efficient given in Table-3 pointed out that in SMB, only upward communication with superior in case of direction of communication flow was positively and highly significantly correlated with the effectiveness of the organization . Hence, it can be inferred that with an increase in upward communication with the superiors, the effectiveness of SMB could be enhanced. It might be due to the fact that upward communication provides, the superiors a measure of subordinates responsiveness through feedback information and promotes acceptance of decisions by engaging subordinates to participate in decision making which contributes positively to the organizational effectiveness.

Table2:Correlation coefficients (r) of independent variables with organizational effectiveness in SMB and PCDF

Independent Variables	Organizational Effectiveness	
	SMB (r)	PCDF (r)
Experience	0.01	0.27**
Interpersonal trust	0.07	0.30**
Upward communication with superiors	0.27**	0.04
Upward communication from subordinates	0.07	0.28**
	* P < 0.05,	** P < 0.01.

A close perusal of table-3 further indicated that in PCDF, out of personal traits only experience and interpersonal trust were found to have a positive and significant correlation with the effectiveness of the organization. It showed that higher the experience and interpersonal trust among the organizational members, higher was the effectiveness. Out of all studied communication variable, only upward communication from subordinates was positively and significantly related with organizational effectiveness in PCDF. It indicated that higher the upward communication from the subordinates, the

PCDF would turn out to be more effective organization. Ingale (1987), reported that communication prevailing in organization, interpersonal contact and mass media exposure had a positive and significant relationship with organizational effectiveness.

CONCLUSION

The study amply demonstrated that the extent of vertical communication was more than horizontal communication in both PCDF and SMB. In vertical communication, the amount of downward communication was higher than that of upward communication at all levels in both the organizations. However, the upward communication had positive and significant relationship with the organizational effectiveness. Hence, top management of the dairy organization must recognize the importance of upward communication which provides feedback for messages sent downward by management that encourages the submission of ideas and suggestions by subordinates and further promotes acceptance of decision by encouraging subordinates to participate in the decision making process.

The extent of horizontal communication was found to be much lower for official purposes. The administrator of diary organization must take in to cognizance that horizontal communication helps in coordination between departments, assists in problem solving and allows sharing of information among the colleagues; thereby contributing to the effective functioning of the organization. Thus, there is need to promote effective horizontal communication.

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Effectiveness and Impact of Interactive Electronic Media on Knowledge Grain: Beekeeping

Shalini Asrani and Sushma Kaushik

Abstract

An interactive CD ROM of beekeeping in Hindi and Video Film of 25 minutes duration was prepared. An exhaustive list of various messages and sub messages was prepared with the help of reviews and available literature. Ten main messages were selected which were further broken down into sub messages. The prepared interactive media i.e. CD ROM was tested in terms of attributes of accuracy, coverage, objectivity, content presentation, illustrations, writing style and compatibility. It was found to be effective for most of the parameters. Audio Quality, Video Quality, Presentation of Message, Duration of Programme, Content Importance and Suitability were found to be effective for most of the parameters in video films. It was found to have significant impact on knowledge gain of respondents by interactive electronic media.

Beekeeping has a great scope in the country to develop as prime agro horticulture and forest based rural industry. Farmers can adopt beekeeping as profession to supplement their income as additional work without affecting their main activity of farming. It has greater importance for small, marginal farmers and landless labourers especially. It can be easily taken by rural women as a source of income generation and employment.

Communication and Information Support Services are blood streams of all interactive media are the means that allow for active participation by the recipient, hence establish two way communications. The present study was conducted to develop and test interactive media (CD ROM and Video) on beekeeping so as to assess its effectiveness and impact.

METHODOLOGY

An interactive CD ROM in Hindi along with printed version and documentary (video film) was planned, as it is a highly useful information storage device. Standard steps for preparation of CD ROM and video film were followed. An exhaustive list of various messages and sub messages was prepared with the help of reviews and available literature. The prepared list was subjected to judges so as to identify crucial and relevant messages for farm families. Out of the list, ten most crucial messages were selected. The selected ten messates were broken down into subsequent critical sub messages. The front page (HOME) of CD included title of CD, details about project, documentary, details about team and printable version of CD ROM. In total, ten messages contained 55 pages along with 64 pictures which make the chapters more interesting and understandable. After each chapter self instructional exercises were given. At the end an additional chapter on 'Frequently Asked Questions' (FAQs), was added for better clarity of the subject. To make improvements, it was given to scientists of Department of Entomology and Home Science Extension Education, CCS HAU, Hisar for

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reviewing. After which the final text was published in Microsoft Flash Programme including a documentary of 20 minutes duration.

The effectiveness of the prepared media package was assessed by showing them to 30 judges comprising extension workers, teachers al1d scientists. Assessment of effectiveness of video film was done on selected parameters according to modified scale of Sethi (1993) while the effectiveness of CD was measured through modified scale of Midha (2001). Schedule for the same was developed. All components had subcomponents which were scored on a three-point rating scale as high, moderate and low having scores of 3, 2 and 1, respectively. Weighted mean scores of all the components were calculated. Impact of CD ROM and video film was measured in terms of knowledge gain of the respondents for beekeeping messages.

RESULTS AND DISCUSSION

1. Selection of messages related to beekeeping

A list of various messages on beekeeping was prepared in consultation with experts and available literature. Responses were obtained from respondents as most needed, 'needed' and 'least needed' messages. Out of the list, those messages having weighted mean score of more than 2.00 were finally selected for the preparation of media and those messages, having weighted mean less than 2.00, were rejected. Table 1 depicts selection of messages related to beekeeping. It is clear from the table that a total of ten messages viz. 'Importance of beekeeping, 'Preliminary information about beekeeping', 'Species of bees and their work habits', 'Hive products and their values', 'Bee colonies examination' 'Management of bees in different seasons', 'Identification of bee diseases. Enemies and their control, 'Honey extraction, filtration, storage

Table 1: Selection of messages related to beekeeping

S. No.	Messages	Most needed	Needed	Least needed	Total wt. mean
1.	History and concept of beekeeping	21	15	64	1.57
2.	Importance of beekeeping	72	28	-	2.72*
3.	Importance information about beekeeping	57	40	3	2.54*
4.	Species of bees and their work habits	61	27	12	2.49*
5.	Nutritional requirements of honey bees	10	12	78	1.32
6.	Management of bees in different seasons	48	38	14	2.34*
7.	Role of a biotic factors in beekeeping	5	17	78	1.27
8.	Identification of bee diseases, enemies & their control	52	43	5	2.47*
9.	Hive products and their values	42	50	6	2.32*
10.	Artificial insemination of queen bee	6	18	76	1.24
11	Management of bee colonies	45	48	7	2.38*
12.	Honey extraction, filtration, storage & sale	65	24	11	2.54*
13.	Bee colonies examination	58	40	2	2.56*
14.	The flight of bees	-	10	82	1.02
14.	Economics of beekeeping	62	38	-	2.62*

*selected messages

and sale', 'management of bee colonies' and 'Economics of bee keeping', were selected and five messages viz., 'History and concept of beekeeping', 'Nutritional requirements of honey bees', 'Role of abiotic factors in beekeeping', 'Artificial insemination of queen bee' and 'the flight of bees' were rejected.

2. Effectiveness of various beekeeping messages for CD as perceived by judges:

Table 2 depicts that the accuracy of CD was perceived to be high for all the messages on all the parameters, maximum score was 2.93 for M_1, followed by 2.91 for M_4, 2.89 for M_6 and lastly scored 2.82 for M_7. Coverage and objectivity of the CD was perceived to be high for all the messages and the overall mean score for all the ten messages was high. M_3 was found to be having highest scores followed by M_1 and M_8. Thus it clearly indicates that write up of all the messages was clearly stated, self explanatory and information appeared to be valid and well researched. Content presentation overall mean scores revealed that M_1 ranked highest in terms of content presentation followed by M_2 M_4, M_9, M_5. M_{10}, M_3, M_6, M_7 and M_8. However as far as overall mean scores are concerned, M_1 score highest in terms of illustrations followed by M_6, M_8, M_2, M_3, M_5, M_9 and M_4. Overall mean score for all the messages ranged from 2.86 to 2.96 which indicates that CD was perceived to be highly effective in terms of writing style. Maximum score was given to message M_4 fallowed by M_3, M_1, M_2 and, M_{10}. So modification was done to make the language simpler.

Compatibility of CD was also found to be high for all the messages (above 2.86), maximum for M_1 and minimum for M_{10}. Thus it clearly indicates that presentation of material on various messages is according to audience background needs, interests, customs and value system.

3. Effectiveness of video film on beekeeping as perceived by judges

Table 3 shows the overall effectiveness of video film prepared on various beekeeping messages in terms of 'audio quality', 'video quality', 'presentation of messages', content importance and suitability, and

Table 2: Effectiveness of various beekeeping messages for CD as perceived by judges

S. No.	Attributes of performance	Weighted means score Messages									
		M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
1.	Attributes of accuracy	2.93	2.86	2.87	2.91	2.88	2.89	2.82	2.83	2.88	2.86
2.	Attributes of coverage and objectivity	2.85	2.78	2.88	2.80	2.83	2.82	2.81	2.85	2.79	2.75
3.	Attributes of content presentation	2.95	2.94	2.89	2.93	2.91	2.88	2.87	2.86	2.92	2.90
4.	Attributes of illustrations	2.95	2.93	2.91	2.89	2.90	2.94	2.88	2.93	2.89	2.88
5.	Attributes of writing style and compatibility	2.94	2.93	2.95	2.96	2.89	2.91	2.86	2.87	2.90	2.92
6.	Compatibility	2.99	2.96	2.90	2.86	2.88	2.91	2.95	2.92	2.89	2.88

Maximum mean score is 3.00, Low : 1-1.66, Medium : 1.67-2.32, High : 2.33-3.00

Table 3: Effectiveness of video film on beekeeping as perceived by judges

S. No.	Attributes of performance	Response category			Weighted mean score
		High	Moderate	Low	
1.	Audio quality	26	4	-	2.86
2.	Video quality	20	8	2	2.60
3.	Presentation of message	25	5	-	2.83
4.	Content importance and suitability	22	8	-	2.73
5.	Duration of programme	13	17	-	2.43
	Overall mean scores	21.2	8.4	0.4	2.69

Maximum mean score is 3.00, Low : 1-1.66, Medium : 1.67-2.32, High : 2.33-3.00

'duration of programme'. It is revealed from the table that majority of judges scored high for all the parameters except 'duration of the programme'. The duration was perceived to be longer, hence it was further modified and cut short for 5 minutes keeping final film for 20 minutes duration. Thus it is clear from table that effectiveness of video film in terms of 'audio quality' (2.86), 'presentation of message' (2.83) were rated to be maximum followed by content importance and suitability (2.73), 'video quality' (2.60), and 'duration of programme' (2.43) Further examination of table shows that the overall effectiveness of video film was rated high with weighted mean score of 2.69, thereby indicating that the developed video-film on beekeeping was quite effective in educating the respondents about importance of beekeeping and related aspects. Study also observed similar perception about video film developed and tested by them. It can be concluded that the quality parameters of video film prepared on "Beekeeping" have been perceived quite high by a large majority of respondents.

4. Impact of media on rural respondents:

Table 3 reveals mean pre and post exposure knowledge scores and mean knowledge gained for all the ten beekeeping messages. It can be seen from the table that in female the maximum knowledge gain was recorded for M_{10} (Economics of beekeeping), followed by M_4 (Hive products and their values), and M_1 (Importance of beekeeping). The 't' values for these three messages along with messages M_8 (Honey extraction. Filtration and sale) and M_9 (Management of bee colonies) were found significant thus indicating that females gained significant knowledge for these messages after exposure to media.

In case of males again maximum gain was attained for M_{10} (Economic of beekeeping) followed by MK (Honey extraction, filtration & sale), M_6 (Management of bee colonies in different seasons) and M_7 (Identification of bee diseases, enemies and their control). Significant gain in knowledge for these messages was recorded along with M_3 (Species of bees and their work habits), M_5 (Bee colonies examination) and M_9 (Management of bee colonies) as shown by significant 't' values.

It can be elucidated from table that maximum gain in knowledge was observed for M_{10} (Economics of beekeeping) which shows that economic benefits were the most attractive enablers that might have caused maximum attention and hence maximum knowledge gain in all respondents. It can also be seen from table that though women had gail1ed significant knowledge for M_1 and M_4, the gain in knowledge for male respondents was non significant, Perhaps because the messages were simple and male

Table 4: Differential gain in knowledge scores regarding beekeeping messages

S. No.	Chapters	Female				Male			
		Pre Expo.	Post Expo.	Gain in khowledge	't' value	Pre Expo.	Post Expo.	Gain in khowledge	't' value
M_1	Importance of beekeeping	2.1	4.2	2.1	3.182*	3.5	4.8	1.3	1.235
M_2	Preliminary information about beekeeping	1.1	2.5	1.4	1.581	1.7	2.8	1.1	0.973
M_3	Species of bees and their work habits	1.7	2.5	0.8	0.437	2.1	4.5	2.4	4.541*
M_4	Hive products and their values	1.2	3.5	2.3	4.303*	2.5	4.2	1.7	1.812
M_5	Bee colonies examination	0.5	2.6	2.1	2.674*	1.6	3.8	2.2	3.785*
M_6	Bee colonies examinatio	1.5	3.2	1.7	1.812	0.9	3.5	2.6	5.841*
M_7	Identification of bee diseases, enemies and their control	0.6	1.5	0.9	0.643	2.8	5.3	2.5	4.809*
M_8	Honey extaction, filtration storage and sale	1.7	3.6	1.9	2.776*	0.8	3.5	2.7	6.812*
M_9	Management of bee colonies	0.6	2.4	1.8	1.943*	1.5	3.7	2.2	3.785*
M_{10}	Economics of beekeeping	0.4	2.8	2.4	4.541*	1.5	4.7	3.2	8.784*

respondents already had sufficient pre exposure knowledge. Therefore, their gain in knowledge was not significant.

Hence it can be concluded from the table that significant gain in knowledge was attained by respondents for most of the messages after exposure to media.

CONCLUSION

The prepared interactive media i.e. CD ROM and video film were found to be effective for most of the parameters and was found to have significant impact on knowledge of the respondents. It implies that more such media should be prepared and used.

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Television: Source of Entertainment and Food Related Behaviour Modification in Children

Rita Singh Raghuvanshi* and Hitaishi Singh**

Abstract

Television is a very powerful media and television advertising may have a major influence on children's eating habits. A study of school children was conducted on availability and utilization pattern of information gained by the children through television viewing. The study revealed that the children were watching TV for 4 to 5 hours per day. The preferred programmes were cartoon (28%), children's programmes (26%), sports (24%) dance and music (12%) and other programme (10%). The preferred food related advertisements included noodles, health drinks, biscuits, chocolates, chips and cold drinks. In 48 per cent of the cases, the demand of foodstuffs shown on TV was fulfilled by the parents. In the opinion of parents, viewing of TV adversely affected appetite (60%). However, some entertainments serials and advertisements for toothpaste, on health tips, health drinks and yoga programme had positive influence on children's behaviour. TV programmes were seen to increase general knowledge, vocabulary and personal hygiene.

In the modern world, the most pervasive and powerful influence on an individual's attitude is brought about by the mass media: television, radio, newspapers, magazines and films. These media the influence of television is the most powerful on growing young people. Television has a powerful influence on what children eat. It encourages consumption of junk foods and lowers consumption of fruits and vegetables. Many studies have highlighted that subtleties of advertising are not understood by children and that television advertising is a major influence on children's poor eating habits (Jarlbro, 2001 and Bjurnstrom, 1994).

Studies show that upto 4 years of age children see advertisements as entertainment. By 6 to 7 years of age they believe advertising is there to provide them with information and upto 7 to 8 years of age, children cannot distinguish between information and intent to persuade (Young, 1998). By 10 to 12 years of age, most children can understand the motives and aims of advertising, but majority are unable to give an explanation of television advertising that shows they understand sales techniques. (Ward *et al*., 1997).

Food habits established during the early years of life may affect a person's food behaviour throughout life.

Television advertising depicts an unbalanced diet to children and is in direct conflict with messages about healthy eating. Keeping this in view the present study was conducted to see the effect of television advertisements on children's behaviour with reference to food.

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METHODOLOGY

Fifty children of (25 boys and 25 girls) of age group 10-13 years from local school were selected as respondents and data collected with schedules and interviews. The data was collected by interviewing the subjects. The parents of the children were also interviewed for their opinion about their children regarding various aspects of television programmes. Data thus collected was statistically analyzed and inferences dawn.

RESULTS AND DISCUSSION

General profile of the children is presented in table 1.

Table 1: General profile of the children (N=50)

S.No.	Particular	Percent of subjects
1.	**Age**	
	10 years	24
	11 years	20
	12 years	28
	13 years	28
2.	**Sex**	
	Male	50
	Female	50
3.	**Religion**	
	Hindu	86
	Muslim	14
4.	**Dietary habit**	
	Vegetarian	20
	Non-vegetarian	80
5.	**Type of family**	
	Nuclear	68
	Joint	32
6.	**Education of mothers**	
	Illiterate	4
	Primary	6
	Middle	4
	High school	20
	Intermediate	22
	Graduate	28
	Post graduate	16
7.	**Monthly income of family**	
	Rs. < 5,000	16
	Rs. 5,000 to 10,000	58
	Rs. >10, 000	26

Table 2 . TV utilization among the subjects

S.No.	Particular	Percent of subjects
1.	**Availability of TV**	
	DD1	36
	Cable	64
2.	**Duration of watching TV during school days**	
	< 1 hour	14
	2-3 hours	16
	4-5 hours	42
	6-8 hours	28
3.	**Preference of food related advertisements**	
	Noodles	8
	Health drinks	4
	Biscuits and chocolates	6
	Chips and cold drinks	4
	All advertisements	76
4.	**Preference for TV programmes**	
	Cartoons	28
	Children's programme	26
	Sports	24
	Dance & Music	12
	Universal	10

The food related advertisements are all the products having high calorie value and very low content of other nutrients. The children view TV programmes for 4 to 5 hours daily during school days, indicating that this time is spent in the most sedentary way. Lack of physical activities during the growing years adversely affects the muscle growth. The sedentary pattern of life with adequate high calorie food availability may increase the possibility of obesity in children.

Information regarding exposure to television advertisements and behaviour modification in children is presented in table 3. The intake of advertised foods in place of normal meal in case of 60 per cent of the subjects is an issue of concern as most of the advertised food contain high energy value with low density nutrients.

TV advertising exploits children's trust because children do not realize that advertisers view them as a source of sales and profit. The buying of new foodstuffs was influenced by advertisements in 48 per cent of the subjects. For 28 per cent it was related to their favourite actors/models. Watching TV during meals is more common in families with lower maternal education. In the present study 88 per cent of the children had their meals while watching TV in spite of higher literacy rate among mothers. In fact the influence of TV viewing was also seen on parent's buying habits and their health. Meal preparation was also affected in 38 per cent of the cases, which ultimately affected the appetite of children (66%).

Ninety four per cent of the parents were of the opinion that their children were influenced by "Shaktiman" serial which provided entertainment along with motivation to children to adopt good dietary habits and personal hygiene tips. Cartoon programmes and the favourite model/filmstar of the children also had a great influence on their food habits. About 90 per cent of the children were taking health drinks. The intake was seen more in case of boys as compared to that in girls.

Yoga programme was watched regularly by 66 per cent of the children and sometimes by 18 per cent of

Table 3. Exposure to advertisements and behaviour modification in children

(N=50)

S. No.	Particular	Percent of subject		
		Yes	No	Sometimes
1.	TV viewing time of children decided by parents	76	24	-
2.	Influence of food related advertisements on children	76	24	-
3.	Fulfillment of demand of foodstuff shown on TV	48	52	-
4.	Effect of advertisement on budget	40	60	-
5.	Interest of children on advertise food	42	58	-
6.	Effect of advertisement on children's health	54	44	02
7.	Intake of advertised food daily	4	94	02
8.	Intake of advertised foodstuff in place of normal meal	60	38	02
9.	Influence of advertisement on buying of new food stuff	48	50	02
10.	Influence of advertisement related to actors/models	28	28	44
11.	Food eaten while watching TV	88	12	-
12.	Influence of TV on meal preparation	38	56	06
13.	Influence of advertisement on parents	26	74	-
14.	Influence of advertisement on parents about buying of that food stuff	12*	76	12
15.	Influence of advertisement on buying food stuff	30	40	30
16.	Adverse effect of TV on health	50	50	-
17.	Effect of TV viewing on activeness60	40	-	
18.	Effect of TV viewing on appetite	66	34	-

Table 4. Impact of TV programmes/advertisement on health and habits of children (N=50)

Sl. No.	Programme/ advertisement	Per cent of subject								
		Total			Male			Female		
		Y	N	S	Y	N	S	Y	N	S
1.	**Advertisements**									
	Toothpaste	100	-	-	100	-	-	100	-	-
	Snacks	44	22	34	48	20	32	40	24	36
	Toffee/sweets	10	22	68	12	24	64	8	20	72
	Health tips	76	12	12	72	16	12	80	8	12
	Health drinks	90	4	6	92	-	8	88	8	3
	Bath soaps	100	-	-	100	-	-	100	-	-
2.	**Yoga Programme**	66	16	18	60	24	16	72	8	20
3.	**Serial** Entertainment									
	'Shaktiman'	94	-	6	96	-	4	92	-	8
	Cartoon	88	4	8	92	4	4	84	4	12
	Other/model/filmstar	94	-	6	96	-	4	92	-	8
4.	Cookery programme (mother)	60	12	28	52	12	36	68	12	20

* Y= Yes, N= No, S= Some times

Table 5. Parents opinion about their children regarding various aspects of watching television

Statement	Opinion abut their children regarding various aspects of watching television								
	Total			Male			Female		
	Positive	No.eff.	Negative	Positive	No.eff.	Negative	Positive	No.eff.	Negative
Education	86	12	2	92	8	0	88	12	0
Peer group	56	38	6	4	32	64	48	44	8
Household work	30	60	10	32	56	12	28	64	8
Play	24	64	12	36	60	4	12	68	20
Eating	28	62	10	24	64	12	32	56	12
Behaviour	54	70	6	60	32	8	48	44	8
General knowledge	60	28	12	64	28	8	52	32	16
Vocabulary	64	28	8	76	16	8	52	40	8
Creativity	44	48	8	52	36	12	36	60	4
Personal hygiene	42	42	16	48	28	24	32	56	12

the children through. Girls notched these more than. Regarding impact of TV on mothers, it was found that 60 per cent of the mothers were influenced by cookery programmes.

Most of the parents were of the opinion that TV had a positive impact on the education, general knowledge and vocabulary of the child and the effect was more pronounced in case of boys as compared to girls. The boys generally prefer to watch sports and quiz programmes whereas girls were more interested in watching serials, films and music channels. Watching television is believed to decrease the social circle of the children as the individual children limit their world to TV. This was found true in case of boys as 64 per cent of the boys reduced their peer group because of watching television. However, the case was just reverse with girls as 48 per cent of the girls had increased peer group because of watching television and 44 per cent had no effect on peer group. Children become conscious of personal hygiene as a result of watching serials like 'Shaktiman' and other health related cartoon programmes.

CONCLUSION

Children are great viewers of TV as well as a potentially vulnerable audience easily influenced by the media. If TV is utilized appropriately and appreciated for its potential worth as an educational tool, it can be an asset to the field of nutrition education. Food related advertisements addressed to the young audience should have appropriate nutrition message. Advertisements affect children's behaviour in demanding the foods advertised and parents purchasing habits as they yield to the children's demands.

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Training Needs of Mid Hill Farmers in Uttarakhand

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Abstract

Identification of training needs is the first element and a critical one in the training activity. Success of the training function depends greatly on the correct identification of needs. The present study assessed the training needs of farmers in mid hills of Uttarakhand on cultivation of wheat, paddy and potato. A total 120 farmers were surveyed from four villages of two different blocks. The training needs were categorized on three-point continuum. In the cultivation of wheat (irrigated) weed control (2.60), improved variety (2.48), and input availability (2.42) were the most essential training needs for enhancing productivity. Extensive training in paddy cultivation were required on accurate transplanting (2.83), seed rate in nursery (2.75), time and method of seed sowing in nursery (2.67), input availability (2.51) and suitable variety (2.50) to farmers conditions. Training needs in rainfed wheat were on moisture conservation (2.66), line sowing (2.50), suitable varieties (2.40) and potato crop needs heavy training to get maximum benefit on suitable varieties (2.88) for higher hills, storage (2.84) methods, seed rate and sowing method (2.71), knowledge on seed sprouting (2.58), price in market (2.50), control of diseases and pest (2.50). It is suggested to incorporate the identified needs in designing the farmers training programme in mid hills for grater adoption of agricultural technologies.

Human resource system must have the capability to assess various aspects of the entire training process – starting with need identification to transfer of learning on the job (Lynton & Pareek 1990). It is a general complaint of the farmers that the training programme offered to them are not relevant to their present and future job. No training programme would bring desirable changes in the knowledge, skill, and attitude unless it is need based. The training programme based on the accurate training needs on the trainees is always not only sound but also cost effective. The training needs vary with the different members of the family according to the nature of occupations they perform. They also vary according to the present level of adoption of improved practices and the stages of adoption themselves. Thus it is essential to first ascertain the needs of trainees to make the program a success and realizes the ultimate objective of improving agricultural production. Morrison (1976) stated that training needs exists anytime when an actual condition differ from desirable condition in the human or people aspects of performance.

METHODOLOGY

Study was conducted among farmers from four villages viz. Gandhak, Kotuli and Tana, Chanoda under rainfed and irrigated conditions, respectively. All four villages are located in Almora district of Uttarakhand under two different development blocks viz. Dhouladevi and Takula. Stratified and purposive sampling were used to draw sample. Important crops selected to study the training needs of farmers, were wheat and paddy under irrigated whereas wheat and potato from rainfed condition. Thirty farmers/ growers from each crop category (n=120) were selected representing the village families.

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In order to ascertain training need of farmers in major area of wheat, paddy and potato, specific list of items were prepared through review of available literature and experts opinion. A schedule was prepared to collect the information from the farmers. It was tested under field condition and accordingly modified.

The training needs of farmers were assessed using 3 point rating scale i.e. Most needed, Needed and Not needed and were quantified by assigning corresponding weightages of 3, 2 and 1, respectively. The responses against each of item of the main areas depending upon their level of training needs received. First of all total training need score of a particular item was calculated considering the responses expressed by all the respondents. Then the mean score of a particular item was workout by dividing the total score of particular item with a total number of respondents. Finally based on the mean score the rank order of preference for training in particular area was for the preference training in a particular area the below mentioned scale was used.

Most needed =2.33-3.00, needed =1.66-2.33, not needed =1.00-1.66

RESULTS AND DISCUSSION

1. Perceived training need of Wheat (Irrigated) growers

Farmers were facing weed problem mainly *ranunculus* in wheat cultivation under irrigated conditions Traditional wheat varieties are still cultivated and the seeds of improved varieties and other inputs like fertilizers, herbicide, and insecticide not easily available in local market. Training needs portrayed in Table 1 establishes that weed control (2.60), improved variety (2.48), input availability (2.42) were the most essential training needs for enhancing the wheat productivity. Farmers were also required to be skilled in line sowing (2.31), soil sampling/testing (2.19). Threshing (2.10) is done manually takes more time therefore mechanical thresher needs to be introduced. Farmers did not felt training requirement on land preparation, seed treatment and fertilizer application.

2. Perceived training need of paddy growers

Paddy is irrigated crop in valley area. Training needs portrayed in table 2 shows that the farmers practiced traditional varieties and cultural practices in paddy cultivation. Therefore they need extensive training in the areas of transplanting of seedlings (2.83), seed

Table 1: Perceived training need of wheat (irrigated) growers

N1 =30

S.No.	Components of technology	Mean score	Rank	Level of training
1.	Weed control	2.60	I	Most needed
2.	Improved varieties for grain & fodder	2.48	II	Most needed
3.	Input availability	2.42	III	Most needed
4.	Line sowing method	2.31	IV	Needed
5.	Soil sampling/testing	2.19	V	Needed
6.	Threshing	2.10	VI	Needed
7.	Time of sowing	2.00	VII	Needed
8.	Seed rate	1.78	VIII	Needed
9.	Disease and pest identification and control	1.72	IX	Needed
10.	Fertilizer doses and application	1.62	X	Not needed
11.	Land preparation	1.48	XI	Not needed
12.	Seed treatment	1.30	XII	Not needed
		24.0		

rate in nursery (2.75), accurate time and method of seed sowing in nursery, nursery management mainly weeding and irrigation stages (2.67), input availability (2.51) and suitable variety (2.50) to their conditions. Farmers mostly use manure therefore they need less training to inorganic fertilizers (2.16). Training on herbicide and weed control in nursery (2.08) is required. The occurrence of disease and pest is not regular but their appearance cause heavy loss. Therefore, farmers must know about prevalent diseases and pests. Post harvest operation done manually. Land preparation and soil testing need not much training.

Table 2: Perceived training need of paddy growers

N2 =30

S.No.	Components of technology	Mean score	Rank	Level of training
1.	Transplanting of seedlings	2.83	I	Most needed
2.	Seed rate	2.75	II	Most needed
3.	Time of seed sowing in nursery	2.67	III	Most needed
4.	Nursery management	2.66	IV	Most needed
5.	Input availability and rate	2.51	V	Most needed
6.	Suitable varieties	2.50	VI	Most needed
7.	Fertilizer application	2.16	VII	Needed
8.	Herbicide and weed control	2.08	VIII	Needed
9.	Control of diseases and pest	1.83	IX	Needed
10.	Post harvest measures	1.66	X	Not needed
11.	Land preparation	1.16	XI	Not needed
12.	Soil testing	1.13	XII	Not needed
		25.94		

Table 3: Perceived training need of Wheat (Rainfed) growers

N3=30

S.No	Components of technology	Mean score	Rank	Level of training
1.	Pre-sowing moisture conservation practices	2.66	I	Most needed
2.	Line sowing methods	2.50	II	Most needed
3.	Varieties for higher altitude	2.42	III	Most needed
4.	Input availability	2.33	IV	Most needed
5.	Time of sowing	2.00	V	Needed
6.	Fertilizer dose and application	1.91	VI	Needed
7.	Seed rate	1.83	VII	Needed
8.	Soil testing	1.50	VIII	Not needed
9.	Control of diseases and pest	1.34	IX	Not needed
10.	Seed treatment	1.33	X	Not needed
11.	Post harvest measures	1.25	XI	Not needed
12.	Weed control	1.16	XII	Not needed
		22.23		

Table 4: Perceived Training Need of Potato Growers

N4=30

S.No	Components of technology	Mean score	Rank	Level of training
1.	Suitable varieties for the area	2.88	I	Most needed
2.	Storage methods	2.84	II	Most needed
3.	Sowing method and seed rate	2.71	III	Most needed
4.	Seed sprouting and germination	2.58	IV	Most needed
5.	Marketing	2.57	V	Most needed
6.	Control of diseases and pests	2.50	VI	Most needed
7.	Input availability and rate	2.43	VII	Most needed
8.	Seed treatment	2.28	VIII	Needed
9.	Seed source	2.02	IX	Needed
10.	Fertilizer application	2.00	X	Needed
11.	Earthing up	1.73	XI	Needed
12.	Land preparation	1.28	XII	Not needed
		27.82		

3. Perceived training need of Wheat (Rainfed) growers

Wheat is also cultivated in rainfed area in hills. Training needs depicted in table 3. The risk is very high as crop depends on rainwater. The winter rains are essential to establish the crop. But farmers do not know about moisture conservation (2.66) practices that can help the germination of the crop. Seed is broadcasted at sowing cause poor germination. They are not skilled about line sowing (2.50) behind the plough. Their knowledge about the suitable varieties is poor (2.40). The improved seed is also not available (2.33) easily. To get benefit of residual moisture wheat to be sown (2.00) early but due to traditional culture they did late sowing. Their knowledge about seed rate (1.83) and fertilizer application (1.91) was poor. The occurrence of disease and pest, weeds problem is less in rainfed wheat might no need of training.

4. Perceived training need of potato growers

Potato is a cash crop that fetches good amount of money. It's also cultivated in rainfed where productivity governs by timely rains. Training needs as portrayed in Table –4 are training on suitable varieties, traditional storage method practice as cold store facilities are out of reach, appropriate sowing method and seed rate training. Seed treatment, seed source, fertilizer application, and earthing up were the other areas identified.

CONCLUSIONS

The assessed training needs in wheat cultivation clearly differ under irrigated and rainfed conditions. Heavy training needs were observed in potato followed by paddy and wheat cultivation. The inputs availability must be ensured in local market to utilize the fruits of training back to home. The study suggests that research and development agencies should take into consideration areas of deficiencies identified in design their regular training programmes for farmers in mid hills. This will make farmers training more efficient and effective to greater adoption of agricultural technologies.

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Perceived Constraints by Trainees During Training Programmes at Extension Education Institute, Nilokheri (Haryana)

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Abstract

A training is considered as fundamental means of up-gradation of professional skills. The Extension Education Institutes are doing this job at the apex level in the country. The effectiveness of any training programme must be assessed to make it more meaningful and effective. A study was conducted to assess the constraints faced by trainees while attending the training programme organized by Extension Education institute, Nilokheri (Haryana) constraints like lack of facility for recording unit, no proper facility for photographic unit, lack of video production facility and lack of modem teaching aids like laptop and multimedia and lack of trained staff were viewed as very serious.

The first extension education Institute was established at Nilokheri (Haryana) in 1959, primarily as Trainer's Training Institute to provide training in extension, teaching and communication media to the instructional staff of GTCs/ETCs ad subsequently it has been assigned the responsibility of organizing in-service training for middle level extension personnel. Subject Matter Specialists, Sub Divisional Agricultural Officers working in land based departments, Master trainers of State Agricultural Universities (SAUs) functioning in the northern states of the country. A training is considered as the fundamental means of up gradation of professional skills. The effectiveness of any training programme must be assessed to make it more meaningful and effective. Keeping this in view, the present study was undertaken to identify the constraints faced by the trainees while attending the training programme. The study was conducted in 7 districts of Haryana state having maximum number of trainees who have attended the training programmes during 2001-2004 at the E.E. Institute, Nilokheri.

METHODOLOGY

To measure the constraints encountered by trainees, a schedule consisting of 37 statements was developed. The responses were obtained on three point continuum i.e., very serious, serious and not so serious and the weights of 3, 2 and 1 were assigned respectively. The schedule contained 15, 4, 14 and 4 statements related to constraints of institute. Trainers, Training programmes and Trainees, respectively. After having obtained the responses of 37 statements from 70 respondents, the scoring was done as per prescribed weightage. The statement wise scores of the response were pooled separately for each category of the respondents in the three columns against each statement.

The scores for each statement were worked out and raw scores for each constraints were converted into 'Z' score to find out the degree of seriousness of each constraint. The statements related to each section were classified into three categories viz., very serious, serious and not so serious on the basis of Z scores. The statements having 'Z' value above +1

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were taken as 'very serious', -1 to +1 as 'serious' and with Z value less than -1 as 'not so serious'.

RESULTS AND DISCUSSION

A. Constraints related to institute

The study indicated that a number of problems were encountered by the trainees in relation to the Institute as given in Table 1.

A close examination of Table-1 revealed that disturbance in class due to frequent late-running of trains, lack of facility for recording unit, no proper facilities for photographic unit were perceived as very serious constraints (Z score = 2.72398, 1.21202 and 1.0010 respectively) and, hence these constraints were ranked I, II and III as per the 'Z' scores.

There were some constraints like lack of recording unit, lack of facilities for photographic unit, lack of video production facility, lack of updated computer lab, lack of practical facilities for training programme, timely availability of funds, recreational facilities at the institute, lack of library facilities, and several other which can be taken care of with effective and meticulous planning and availability of sufficient funds.

B. Constraints related to trainers

The data in Table 2 presented the constraints as perceived by the trainees during the training programme. Lack of faculty member in the area of computer section (Z score = 1.63622) was viewed as a very serious constraint and has been ranked I.

Faculty member may be recruited/posted in the area of computer section whereas skill in use of audio visual aids can be enhanced by imparting training to the trainers of the institute on these aspects.

Table 1. Constraints related to Institute

N=70

S. No.	Statements	Z Score $\left(\frac{X - \bar{X}}{SD}\right)$	Rank	Degree of seriousness
1.	Disturbance in the class due to frequenc running of trains	2.72398	I	VS
2.	Lack of facility for recording unit	1.21202	II	VS
3.	No proper facilities for photographic unit	1.0010	III	VS
4.	Lack of facility regarding video production	0.93073	IV	S
5.	Lack of modern teaching aids like multimedia and laptop	0.93073	V	S
6.	Lack of updated computer lab	-0.26476	VI	S
7.	Lack of practical facilities for training programme	-0.33509	VII	S
8.	Funds were not made available in time for training programme	-0.37025	VIII	S
9.	Lack of recreational facilities in the institute	-0.47573	IX	S
10.	Lack of library facilities	-0.61638	X	S
11.	Lack of coordination with other agencies	-0.65154	XI	S
12.	Lack of space for practical facilities in seminar room	-0.68670	XII	S
13.	Lack of essential facilities and equipment	-0.79219	XIII	S
14.	Insufficient funds made available for the training programme	-0.82735	XIV	S
15.	Lack of boarding and lodging facilities	-1.03832	XV	NSS

VS -Very Serious S -Serious NSS -Not so serious

Table 2. Constraints related to trainers

S. No.	Statements	Z Score $\left(\frac{X - \bar{X}}{SD}\right)$	Rank	Degree of seriousness
1.	Lack of faculty member in the area of computer section	1.63622	I	VS
2.	Lack of skill in use of A.V. aids	-0.03805	II	S
3.	Lack of trained, experienced and field oriented staff	-0.064687	III	S
4.	The behaviour of trainers is not worth expected	-1.01129	IV	NSS

VS –Very Serious, S = Serious, NSS = Not So Serious

C. Constraints related to training programme

It was seen from the Table 3 that very serious constraints perceived by the trainees were short duration of training programme (Z score = 2.44792), lack of time allotted to training programme like PRA technique, marketing skill, video production etc. (Z score = 1.20669) and have been ranked as I and II. .

Duration of training programme, time allotted to training programme like PRA technique, marketing skill and video production etc., time for practice to develop skills and time for practical session during

Table 3. Constraints related to training programme

N=70

S. No.	Statements	Z Score $\left(\frac{X - \bar{X}}{SD}\right)$	Rank	Degree of seriousness
1.	Short duration of training programme	2.44792	I	VS
2.	Lack of time allotted to training programme like PRA technique, marketing skill, video production etc.	1.20669	II	VS
3.	Lack of time for practice to develop skills	0.99082	III	S
4.	Lack of time for practical sessions during the training programme	0.39719	IV	S
5.	Non availability of time for field visit	0.34322	V	S
6.	Less duration for workshop on computer application	0.18132	VI	S
7.	Lack of new training methodology	0.12736	VII	S
8.	Lack of visuals for presentation	-0.35833	VIII	S
9.	Lack of interaction with successful entrepreneurs	-0.35833	IX	S
10.	Non suitability of time and duration of training programme	-0.84403	X	S
11.	The training contents were not need based	-0.95196	XI	S
12.	Sequence of course content and learning is not in order	-1.00593	XII	NSS
13.	Lack of proper information about the course	-1.05990	XIII	NSS
14.	The course is not well designed and systematically developed	-1.11386	XIV	NSS

VS = Very Serious, S = Serious, NSS = Not So Serious

training programme, duration of workshop on computer application can be enhanced and adjusted by the training director by effective and meticulous planning. New training methodology, visuals for presentation and need training content, can be taken care of by the authorities to improve training effectiveness.

Table 4. Constraints related to trainees

S. No.	Statements	Z Score $\left(\frac{X - \bar{X}}{SD}\right)$	Rank	Degree of seriousness
1.	Lack of seriousness of participants towards training	1.47968	I	VS
2.	Non-perception of training programme by trainees as the lectures are lengthy and boring	0.33127	II	S
3.	Lack of positive attitude of trainees towards trainers	-0.72879	III	S
4.	No relaxation for expression of views of trainees	-1.08215	IV	NSS

VS = Very Serious, S = Serious, NSS = Not So Serious

Table 5. Suggestions for improvement of training programme

N=70

S. No.	Statements	Frequency	Percentage	Rank order
1.	Duration of training should be increased	64	91.43	I
2.	Duration of training on computer application/PRA technique and information technology should be increased to 15-20 days	60	85.71	II
3.	Faculty member should be appointed in the area of computer	59	84.29	III
4.	Modern methods like laptop, multimedia for presentation should be used	58	82.86	IV
5.	Training programme be made more practical oriented and should include field visits	55	78.57	V
6.	Computer lab should be updated	47	67.14	VI
7.	Use latest knowledge of training/AV aids	42	60.00	VII
8.	Topic related to computer, internet and e-mail system should be added in training programme	40	57.14	VIII
9.	New ideas in training methodology will be useful	36	51.43	IX
10.	During severe cold and fog room heaters should be provided in the hostel for comfortable stay	32	45.71	X
11.	There must be a playground in the institute for trainees	25	28.57	XI
12.	Facilities regarding boarding and lodging should be improved	12	17.14	XII

D. Constraints related to trainees

The data in Table 4 showed that lack of seriousness of participants towards training (Z score = 1.47968) was considered as very serious constraint by the trainees and have been ranked as I.

The trainees may be told about the importance of the training programme so that they will become serious training programme and the training content for training programme may be made effective, precise and interesting.

Trainees suggestions for improvement in training programmes

The results shown in Table 5 revealed that majority (91.43%) of the trainees suggested that duration of training programme should be enhanced. This is in conformity with the findings of Rath and Veerabhadraih (1995), Ramkrishnan and Reddy (2003), whereas 85.71 per cent suggested duration of training on computer application, PRA technique and information technology should be increased to 15 -20 days, 84.29 per cent opined that faculty member should be appointed in the area of computer, 82.86 per cent suggested that modem should be like laptop, multimedia for presentation should be used, while 7857 per cent of trainees suggested that training programme should be made more practical oriented and should include field visits Zamir Ahmed *et al.* (2002) also found similar results.

CONCLUSION

While organizing training programmes, the suggestions of trainees and constraints as experienced by them may be taken care of by authorities so as to increase effectiveness of their training programmes.

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Knowledge and Adoption of Indigenous Technology Practices (ITPs) of Farmers in J&K State

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Abstract

The importance of Indigenous Knowledge can be understood when one realizer that there are no rice or wheat plants or cotton or mustard found lying around in the forest. The fact is that communities of men and women over generations have bred races of several food and cash crops out of the wild species of these plants. The present investigation was conducted in three districts viz. Kathua, Jammu and Udhampur of Jammu and Kashmir State. The samples of 240 respondents were selected through simple random sampling technique. In order to finding out the levels of knowledge and adoption of ITPs of agriculture schedule was prepared. The results revealed that 17.5 per cent, 67.5 per cent and 15 per cent farmers fell under the categories of high, medium, and low knowledge levels, respectively about Indigenous Technological Practices of agriculture. Besides this,62.91 per cent of the respondent were found to be medium adopters, while 14.17 and 22.92 per cent of the farmers were low and high adopters of Indigenous Technological Practices (ITPs), respectively.

The three-fold increase in population has resulted in an over-exploitation of our natural resources, causing ecological and agricultural imbalances. Sustainable Agriculture suffers from some misconceptions: the most common is that Sustainable Agriculture represents a return to some form of low technology 'Backward' or 'traditional' agriculture practices. This is manifestly untrue, as it does not imply rejection of conventional practices, but an incorporation of recent innovations that may originate with the scientists, farmers or both. It is believed that sustainability is merely a technology issue that requires breakthroughs in agricultural research so that agricultural production could be sustained in future. Organic farming, which based on Indigenous Knowledge (ITK) of farmer, is certainly an answer for making available safe food and clean environment. Jammu & Kashmir has 426 thousand hectare of land as rain fed which constitutes about 52 percent of the gross cropped area. There are diverse agro climatic conditions and the altitude range from 215-7012 meters above Mean Sea Level. The crops grown and cropping practices followed in these areas entirely depend upon unpredictable rainfall, which is often erratic and results in wide fluctuations in production. The state also offers ample scope for the development of dry land/rainfed areas for the production of food crops, pulses, and grassland and fodder resources. The rainfed area not only make important contribution to natural food output but also sustains the livestock which are reared in the state as most of wool, meat, egg and milk production comes from the livestock which is

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the subsidiary occupy Indigenous Technological Practices or Scientific Technological Practices attention of dry land farmers of the state. In such condition it is obvious that sustainable which had been the age old ways of livelihood of its citizen can be disadvantageous. Keeping in view the above fact the study "Knowledge and Adoption of Indigenous Technology Practices (ITPs) of Farmers in J&K State" was undertaken with following objectives:

1. To Identify and document farmers' Indigenous Technological Knowledge (ITK)
2. To find out the extent of adoption of Indigenous Technological Practices (ITPs) by the farmers

METHODOLOGY

The present investigation was conducted in districts three districts viz. Kathua, Jammu and Udhampur of Jammu and Kashmir State. Two tehsils from each of the selected district were selected by simple random sampling technique and two revenue villages were selected from each tehsil, therefore 12 villages was selected. 20 farmers from each selected revenue village were selected with the help of random sampling technique. By this way a sample of 240 farmers was drawn. The knowledge level and extent of adoption of ITPs of agriculture was measured in terms of simply how many farmers have been using these practices in their fields. For this purpose schedule was constructed specially for the present investigation. The questions in schedule were then further splited into sub questions comprising a total of 67 in all. The questions were dichotomous type and the responses were recorded into two categories namely yes/no. One mark was given for every 'Yes' answer and zero for every 'No' answer. The range of adoption score was to the total score for the entire item was summed up to find out adoption level of the respondents. The respondents were then grouped into three categories using mean and standard deviation.

RESULTS AND DISCUSSION

Identification and documentation farmers' Indigenous Technological Knowledge (ITK)

The knowledge level about Indigenous Technological Practices was assessed by knowledge test developed and the results are presented in Table 1. The test consisted of question on major aspects namely – Common agronomical practices, Seed treatment practices, Soil fertility management practices, Storage practices, Insect-pest and disease management practices, Local agricultural implements, Animal husbandry practices and other miscellaneous Indigenous Practices.Statistical data regarding the knowledge level of farmers about Indigenous Technological Practices.

Data in the Table -1 revealed that 17.5 per cent, 67.5 per cent and 15 per cent farmers fell under the categories of high, medium, and low knowledge levels, respectively as far as their total knowledge about Indigenous Technological Practices of agriculture was concerned. It may be indicated that majority of the farmers (67.5 per cent) under study were having medium level of knowledge. While studying results aspect-wise, it may be observed that the aspect 'Other miscellaneous indigenous technological practices' secured the highest mean score (72.78) and was ranked first. 'Agronomical practices' (69.44) was ranked at the second position. The 'Insect-pest and disease management practices' secured 68.88 mean score and it accorded third rank followed by 'Seed treatment practices' (68.61) ranked at IVth places 'Local agricultural implements' (66.8) ranked at Vth position, 'Storage practices' (65.27) at VIth ranks; 'Soil fertility management practices' (65.62) accorded at the VIIth position; and lastly Animal husbandry practices' (62.08) ranked at VIIIth place by the farmers. This might be due the fact that the knowledge about Indigenous Technological Practices has been transferred from generation to generation in the farming families

Table 1 : Percentage of Farmer under different knowledge levels on various aspects of Indigenous Technological Knowledge (ITK) of agriculture

S.No.	ITK	High	Medium	Low	Mean Score	Rank
(a)	Common agronomical practices	(55)22.92%	(150)62.5%	(35)14.58%	69.44	II
(b)	Seed treatment practices	(80)33.33%	(94)39.17	(66)27.5%	68.61	IV
(c)	Soil fertility management practices	(51)21.25%	(120)50%	(69)28.75%	64.17	VII
(d)	Storage practices	(28)11.66%	(172)71.66%	(42)17.5%	65.27	VI
(e)	Insect pest and disease management	(42)17.5%	(172)71.67%	(26)10.8%	68.88	III
(f)	Local agril. implements	(49)20.42%	(143)59.58%	(48)20%	66.80	V
(g)	Animal husbandry practices	(24)10%	(159)66.25%	(59)23.75%	62.08	VIII
(h)	Other miscellaneous indigenous technological practices	(70)29.17%	(144)60%	(26)10.83	72.78	I
(i)	Over all knowledge	(42)17.5%	(162)67.5%	(36)15%	-	-

Figure in parenthesis indicate no. of respondents

through discussions during leisure time. It was observed while interviewing the respondents that whether the farmers were using Indigenous Technological Practices or not but they could recall only few Indigenous Technological Practices by giving the reference of their forefathers.This finding is in accordance with those of Brammer (1980), Coughenar and Nazhat (1985); Heisey (1990); Lavania *et al.* (1998) and Sharma *et al.* (1998) who concluded that majority of the farmers possessed high knowledge of agricultural practices.

Extent of adoption of Indigenous Technological Practices (ITPs) by the farmers for promoting Sustainable Agriculture

The extent of adoption was measured by direct scoring method. Based on the scores obtained by respondents, mean score and standard deviation was computed for the purpose of classifying the adoption level in to three classes namely low, medium and high. Statistical data regarding the extent of adoption of Indigenous Technological Practices (ITPs) of agriculture by the farmers have been presented in Table -2

It may be evident from Table -2 that about 62.91 per cent of the respondent were found to be medium adopters, while 14.17 and 22.92 per cent of the farmers were low and high adopters of Indigenous Technological Practices (ITPs), respectively.Hence, it may be inferred from above results that more than half of the respondents were medium adopters of the Indigenous Technological Practices in various crops. Further practices wise adoption by farmers was also measured. There were 67 Indigenous Technological Practices (ITPs) included in adoption schedule. Thus, it is clearly indicated that adoption of Indigenous Technological practices is based on the awareness of farmers about their positive influence. Moreover, Indigenous Technological Practices are highly contributive for promoting sustainable agriculture. So farmers have their positive attitude towards the adoption of Indigenous Technological practices of agriculture.

Table 2: Percentage of farmers under different adoption categories based on their scores

N = 240

S.No.	Score Range	Category of adoption	Number of respondents	Percentage of respondents
1	Up to 25.87	Low adopters	34	14.17
2	25.87 to 36.45	Medium adopters	151	62.91
3	More than 36.45	High adopters	55	22.92

The extent of adoption about different aspects of Indigenous Practices was analyzed separately. The relative importance of all eight aspects were highlighted by ranking them in descending order on the basis of percentage of adoption. The data were recorded and presented in Table 3.

An examination of data in Table -3 revealed that out of eight aspects, 'Animal husbandry practices' and 'Soil fertility management practices' were the most widely adopted practices by the farmers. About 85.47 per cent and 72.29 per cent farmers adopted animal husbandry and soil fertility management practices and ranked 1st & 2nd, respectively. About 68.41 per cent of the respondents had adopted 'Miscellaneous other Indigenous Technological Practices' and was placed at the third rank in the adoption level followed by agronomical practices (67.33%) and Local agricultural implements (agricultural engineering practices) (56.90%) and hence these aspects were ranked IVth and Vth place, respectively. Local 'Storage of practices' (52.38) and 'Seed treatment practices' (47.03) were ranked VIth and VIIth place in the adoption level.

With regard to 'Insect-pest and disease management practices' it may be observed that only 19.64 per cent farmers adopted these practices, which ranked at VIIIth position. It shows that 'Insect-pest and disease management practices' were considered to be the least important in views of the farmers.Thus, inference can be drawn from the above narration that farmers were found very conscious about the Animal

Table 3 : Aspect-wise extent of adoption of Indigenous Technological Practices (ITPs) by the farmers

N = 240

S.No.	Aspect (practices)	Extent of adoption (%)	Rank of adoption
1.	Common agronomical practices	67.33	IV
2.	Seed treatment practices	47.03	VII
3.	Soil fertility management practices	72.29	II
4.	Storage of practices	52.38	VI
5.	Insect-pest and disease management practices	19.64	VIII
6.	Local agricultural implements (agricultural engineering practices)	56.90	V
7.	Animal Husbandry Practices	85.47	I
8.	Miscellaneous other Indigenous Technological Practices	68.41	III

Husbandry practices followed by soil fertility management practices and 'Agronomical practices' among all Indigenous Technological Practices aspect. the aspect-wise analysis showed that adoption level of farmers about animal husbandry practices, soils fertility management practices, agronomical practices and miscellaneous other Indigenous Technological Practices was high as compared to other selected aspects. This was possible due to the reason that these practices were more useful to the farmers. On the other hand farmers were aware about economic and environmental value of these practices and this seems to be the main reason of high adoption of these practices as compared to other aspect-wise practices.The findings are also supported by Slikkerveer *et al.* (1999); Yadav *et al.* (2003).

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Editorial

Towards Inter-disciplinary Convergence : Livelihood Security

Agriculture and livestock sector continue to be primary support system for rural livelihood till date. However the present agricultural and rural development scenario is full of challenges at domestic and international arena. Despite the rough terrain, many opportunities are being opened up to the rural people for their upliftment. Earlier the agricultural system was production based but modem agriculture sector is to be developed essentially on the lines of market based economy. In earlier times, farmer who produced more was considered as a successful farmer. Now, farmers have to develop the competencies of effective marketing, presentation and quality maintenance in concordance with national and international standards. The farmers have to become agripreneur to identify real business opportunities; draws holistic benefit from support system and build the global competitiveness of their produce.

It is imperative that farmers mobilize themselves for group action to have more bargaining power and impact in policy formulations. This necessitates capacity building of farming community using their inherent and indigenous wisdom in developmental alternatives and mobilizing support system in their favours. Utilization of information available through modem communication technology by farmers must be resorted to the betterment of their own situation. Integration of efforts undertaken by various government and non government agencies and corporate social responsibility departments of business houses working towards enhancing livelihood security of rural masses, is essential.

The Society of Community Mobilization for Sustainable Development (MOBILIZATION), established in 2003 as a non-profit professional society, aims at mobilizing community for sustainable development. The society, during these ensuing years had successfully mobilized several researchers, academicians, planners, grass-root mass mobilizers and students and created conducive intellectual atmosphere for introspective deliberations and conducted seminars to address the burning problems of the day.

In this context, the present issue of the journal has the focus on multidisciplinary convergence for sustainable livelihood of rural masses.

The first set of articles deal with managerial competencies of women entrepreneurs, development process, entrepreneurial profile of rural women and technological, economic and infrastructural constraints faced by women entrepreneurs. The next set of articles presented in the journal discusses transfer and adoption of technology related issues in different cropping systems and location, self help groups, technology assessment, constrains in joint forest management, knowledge of women beneficiaries regarding various aspects of dairy cooperatives and appropriateness of drudgery reduction technologies as perceived by farm women.

The last set of articles focuses on nutritional security and communication and training. The articles included are on consumer acceptability trials of double fortified salts, evaluation of iron rich biscuits, mental health of rural adolescent girls, training needs of mid-hill farmers and knowledge, adoption of indigenous technology practices (ITPs) by farmers and food related behaviour modification in children.

The issue in its present form has been possible because of relentless efforts of the editorial team consisting of Dr. Rashmi Singh, Dr. Nishi Sharma, Dr. C.B. Singh and Dr. Anand V. Dubey. I highly appreciate the constant support in editing and designing of the journal.

It is sincerely hoped that the effort is well received by researchers, field extension activists and farmer entrepreneurs. We acknowledge the efforts of the authors for their research articles and accept any shortcomings in this issue as ours. We request all the members and our readers to spread the spirit of ‘MOBILIZATION’.

Chief Editor

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