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EDITORIAL

LOSS OF A PRECIOUS PEARL

On 16th March, 2009 the extension professionals of India received shocking news of sad demise of Dr. Y.P. Singh, an intellectual giant, a great orator, philosopher, an outstanding teacher and scientist in the discipline of agricultural extension. Dr. Y.P. Singh was born on 6th November, 1935 in Daltonganj (Palamu district, Jharkhand) to a royal family. He did his bachelor degree in agriculture and master's in agriculture extension from Bihar agricultural college Sabour, Bihar. He completed his doctoral programme from IARI under the guidance of a renowned psychologist Dr. Udai Pareek. His doctoral work in communication pattern received much attention. He also went to USA to do his post doctoral programme. His leadership qualities were recognized even during his student days at IARI when he became president of IARI students' union.

Dr.Singh's career at HAU, Hissar started with Associate Professorship during 1964.Dr. Fletcher, the then Vice Chancellor of HAU was so much impressed by Dr. Singh that he regarded him as a 'pearl to be recognized and tapped'. Dr. Y.P. Singh mesmerized audiences of all kinds with his great oration and public speaking skills. Dr. Y.P. Singh used to run a speech clinic at HAU and was president of the Literary Society of HAU.

In the area of extension research, Dr. Y.P. Singh has always been considered as a trend-setter and a pioneer who trod on unbeaten paths. The work on indigenous knowledge was started by him as early as 1960s and he can be said to be the 'father' of research in Indigenous Technical Knowledge in India. After he joined as a professor of agricultural extension in 1977 at IARI, New Delhi, he started working at several innovative projects. Dr. Y.P. Singh had a passion for research in the area of 'science of science' which led him to undertake a number of studies on extension referral system, i.e. research system. Several studies were undertaken on research system related to creativity, productivity, leadership styles, and publication behaviour and communication pattern. His work on yield gap is considered as the classical study in the area of adoption and diffusion. Each one of his work attest to his originality and creativity. Extension management was another area of his favourite enquiry. Dr.Y.P.Singh also successfully served as the chief editor of *Indian Journal of Extension Education* for a period of five years and contributed enormously to improve the quality of the journal.

Dr. Y.P. Singh greatly enjoyed his role as professor of agricultural extension which provided ample opportunities to stimulate many young minds with his illuminated in-sights and thoughts which were much ahead of his times. He as a visionary could foresee several things which his peers and contemporaries could not even think of. He never wanted to apply for high level managerial positions and regarded professorship as a very significant and a prestigious position. After a lot of coaxing by his colleagues and friends, he joined as the Joint Director (Extension) at IARI and served in that capacity till his retirement.

Dr. Y.P. Singh's personality had a rare combination of an elevated level of academic and research excellence along with a high degree of personal integrity, compassion, and simplicity. He was also courageous and outspoken to stand for the truth and willing to fight for the right causes of scientific community in his capacity as the president of Agricultural Research Scientists'(ARS) Forum. He was kind hearted and gave respect to one and all. He commanded a great respect and love among his colleagues, students and friends. He still remains a guiding light for all in the family of extensionists all over India. It is our prayer that the Almighty God may give grace to his family members, friends and colleagues to bear the great loss.

K.Vijayaragavan
Chief Editor

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RESEARCH NOTES

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Contributions of Livestock and Poultry in the Determination of Rural Socio-economic Status

P.N. Kaul[1]

ABSTRACT

Livestock plays an very important role in the life of rural people. For finding out the contribution of livestock and poultry in determining the rural socio-economic status, a study was conducted in Farah block of Madhura district. A scale for determining the rural socio-economic status was developed and found that six out of seven items in the scale were related to animals including birds. The study also showed that there was only one factor in socio-economic status.

It is necessary to devise a measure of socio-economic status because almost all extension work is for improving the status of farmers. Quite a number of scales to measure socio-economic status are now available (Kuppuswamy, 1959; Rahudkar, 1960; Verma, 1962; Trivedi, 1963; Shah, 1986; Kulshreshtha, 1988; Mishra and Kaul, 2000; etc.). According to historians, animal farming is older than crop farming. At one stage of human development, a tribe's wealth was known by the size of the animal herds. The question probed in the present study is whether animals (including birds) have still a role to play in the socio-economic status of rural people.

METHODOLOGY

The study was conducted in Farah Block of Mathura district of Uttar Pradesh between the years 1986 and 2001. All the villages in this block were listed and 13 villages were selected by simple random sampling. All the heads of the families in these 13 villages were interviewed personally and thus the data were collected from 1473 households using an interview schedule.

The data were collected on 52 variables for each family. The list of variables is shown in Appendix I. The Intercorelations among the variables were worked out (Table 1). The items were subjected to successive item analysis as per Guilford (1987). With this analysis, seven items were selected. The original intercorrelation matrix of the seven items selected to form the scale, was given in Table 2. Factor analysis was carried out by Thurstone's centroid method (Guilford, 1987). Only one factor could be extracted. The item-total correlations and the communalities of the seven items are presented in Table 3.

Validity and reliability of the scale

The procedure adopted for the construction of the scale showed high validity of the scale. The validity was also tested by known-group method. Out of the total families selected in the sample, four villages in which the lab-to-land programme was going on, were selected and all the heads of households in these villages were requested to name some individuals other than themselves whom they considered to be of high socio-economic status and some individuals of low socio-economic sttaus, in their own village. The results showed that some individuals were ambiguously classed by some as belonging to high socio-economic status whereas the same individuals were judged by others to be belonging to low socio-economic status. However, there were others who were unambiguously classed either way by all those who judged them. The latter group were classified. There were 27 high and 27 low socio-economic status individuals (as nominated) in these four villages. The same 54 individuals were classified into high and low socio-

Table 1. Intercorrelations among the original 52 variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1.00																	
2	.51	1.00																
3	-.08	-.06	1.00															
4	-.23	-.20	.07	1.00														
5	-.08	-.04	.06	.46	1.00													
6	.17	.17	-.08	-.31	-.14	1.00												
7	.32	.29	-.08	-.50	-.32	.35	1.00											
8	.19	.16	-.09	-.45	-.27	.20	42	1.00										
9	-.01	.05	-.09	-.16	-.19	.08	.08	.03	1.00									
10	-.01	.06	-.09	-.17	-.19	.08	.09	.04	.99	1.00								
11	.12	.01	.01	-.20	-.20	.08	.14	.09	.50	.51	.100							
12	.05	.13	-.03	-.21	-.22	.11	.18	.12	.59	.60	.68	1.00						
13	11	.11	.04	-.14	-.17	.01	.05	.07	.28	30	.46	.31	1.00					
14	.17	.02	.00	-.23	-.24	.12	.17	.13	.53	.53	.71	.67	.51	1.00				
15.	.09	.14	-.02	-.21	-.20	.14	.17	.13	.57	.56	.61	.74	.26	.83	.100			
16	.08	.14	.04	-.14	-.16	.01	.10	.07	.26	.27	.38	.27	.78	.51	.23	.100		
17	-.21	-.24	.01	-.07	-.07	.02	.02	.03	-.16	-.15	.02	.00	.02	-.03	-.06	-.03	1.00	
18	-.23	-.05	-.12	.09	-.05	.04	.06	.02	-.14	-.14	.01	.04	.05	.04	.04	.02	.72	1.00
19	.03	-.12	.04	-.06	-.07	.05	.06	.02	-.02	-.02	.07	.05	.04	.06	.04	.04	.49	.12
20	.10	-.28	-.06	-.02	-.02	.02	.04	.04	-.06	-.06	.04	-.06	-.05	.05	-.04	-.05	.13	.01
21	.31	.29	-.06	-.46	-.32	.31	.49	.35	.11	.12	.16	.19	.19	.18	.16	.15	.08	.10
22	.27	.25	-.06	-.44	-.33	.33	.49	.40	.14	.15	.19	.23	.21	.21	.19	.17	.07	.08
23	.17	.18	-.01	-.18	.08	.05	.16	-.02	-.04	-.04	-.03	-.02	-.01	-.03	-.03	.00	-.03	.07
24	.05	.02	-.02	-.01	.04	-.02	.01	.01	.01	.00	.01	.01	-.01	.00	.00	.00	-.02	-.01
25	.13	.09	-.07	-.50	-.32	.28	.40	.49	.08	.08	.14	.20	.09	.17	.15	.11	.06	.08
26	.03	.05	.00	-.04	.03	-.04	-.02	-.14	-.02	-.01	-.05	-.03	-.03	-.03	-.01	-.03	.04	.05
27	.06	-.01	-.03	.04	.08	-.06	-.05	-.06	-.01	-.02	-.03	-.04	-.04	-.02	-.04	-.04	-.03	-.03
28	-.06	-.08	-.04	-.37	-.25	.17	.28	.28	.06	.06	.09	.13	.07	.07	.05	.05	.31	.30
29	.80	.74	-.07	-.23	-.08	18	.32	.20	.00	.00	.07	.08	.12	.10	.11	.12	-.28	-.19
30	.41	.35	-.04	-.35	-.22	.19	.31	.29	.18	.19	.28	.28	.29	.26	.22	.21	.02	.04
31	.26	.25	-.06	-.43	-.31	.31	.46	.36	.13	.14	.18	.20	.18	.20	.18	.14	.06	.08
32	.31	.25	.01	-.04	.01	-.06	-.03	.05	.14	.15	.25	.21	.30	.19	.15	.18	-.06	-.03
33	.09	.04	-.03	-.29	-.19	.13	.22	.24	.06	.06	.09	.09	.07	.10	.09	.08	.06	.04
34	-.12	-.14	-.02	-.19	-.13	.04	.09	.16	.11	.11	.15	.14	.12	.10	.07	.07	.28	.23
35	-.24	-.35	.08	.10	.00	-.05	-.12	-.07	-.10	-.10	.00	-.03	-.03	-.06	-.10	-.10	.42	.30
36	.25	.36	-.09	-.06	.02	.08	.10	.05	.11	.10	-.03	-.02	-.03	.03	.09	.06	-.47	-.35
37	.32	.28	-.08	-.50	-.33	.35	.95	.42	.07	.08	.14	.19	.05	.17	.17	.09	.02	.06
38	.18	.21	-.08	-.31	-.15	.78	.37	.22	.07	.08	.10	.14	.03	.13	.15	.05	.03	.05
39	.26	.23	-.06	-.23	-.22	.18	.27	.15	-.02	-.02	.05	.07	.02	.04	.05	.01	-.03	-.01
40	.22	.15	-.03	-.25	-.15	.18	.43	.17	-.05	-.04	.01	.01	-.02	.03	.02	.03	.03	.04
41	.34	.36	-.05	-.32	-.21	.23	.46	.21	.08	.09	.14	.16	.07	.15	.16	.09	-.05	-.01
42	.21	.16	-.04	-.23	-.14	.15	.26	.23	.00	-.01	.12	.11	.10	.14	.11	.11	.04	.05
43	.00	.02	-.01	.02	.02	.01	-.02	-.02	-.04	-.04	-.03	-.03	-.01	-.05	-.05	-.02	-.03	-.01
44	-.02	.00	.04	.09	.12	-.04	-.08	-.06	-.04	-.04	-.04	-.03	-.03	-.06	-.04	-.04	.02	.00
45	-.01	-.05	.03	.06	.16	-.03	-.08	-.07	-.06	-.06	-.06	-.07	-.03	-.07	-.09	-.04	-.01	-.01
46	.00	.00	.05	.00	.12	-.03	-.06	-.06	-.01	-.02	-.03	-.03	-.02	-.04	-.04	-.04	-.01	-.01
47	.07	.07	-.01	-.01	.02	.02	.01	.06	-.03	-.03	-.01	-.02	.04	-.01	-.01	.04	-.01	-.01
48	.06	.01	.00	.11	.19	-.01	-.08	-.07	-09	-.09	-.07	-.09	-.03	-.06	-.06	-.03	-.02	-.03
49	.03	.01	.00	.12	.12	-.02	-.07	-.08	-.04	-.04	-.04	-.06	-.04	-.04	-.04	-.04	-.02	-.02
50	.08	.05	.00	.02	.07	.05	-.03	-.02	-.08	-.08	-.06	-.08	-.03	-.07	-.08	-.01	-.02	.02
51	.13	.10	.01	.08	.17	.01	-.03	-.04	-.10	-.11	-.08	-.09	-.07	-.10	-.08	-.07	-.04	-.04
52	.23	.20	-.02	-.13	.00	.14	.21	.09	-.06	-.06	.01	.00	.01	.01	.00	.01	-.04	-.01

contd... 1

Variable No.	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
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18																		
19	1.00																	
20	.02	1.00																
21	.07	-.02	1.00															
22	.07	.00	.91	1.00														
23	.01	-.01	.44	.08	1.00													
24	.01	.16	.06	-.02	-.01	1.00												
25	.03	-.01	.36	.50	-.19	-.11	1.00											
26	.01	-.01	.09	-.16	.64	-.04	-.35	1.00										
27	.02	.05	-.02	-.09	-.04	.59	-.16	-.03	1.00									
28	.04	.10	.63	.59	.28	.01	.30	.08	.01	1.00								
29	-.06	-.10	.39	.34	.20	.03	.16	.05	.01	-.08	1.00							
30	.05	-.01	.58	.61	.13	.00	.28	-.05	-.02	.32	.47	1.00						
31	.07	.01	.80	.81	.20	-.01	.41	-.05	-.04	.52	.33	.62	1.00					
32	.01	-0.2	.02	.06	-.06	.01	-.04	-.03	.01	-.11	.33	.61	.04	1.00				
33	.05	.04	.17	.20	-.03	-.03	.43	-.05	-.04	.16	.08	.20	.29	-.04	1.00			
34	.06	.08	.26	.30	.02	-.02	.15	-.02	-.05	.49	-.16	.40	.33	.26	.122	1.00		
35	.00	.20	-.08	-.06	-.05	-.02	-.02	-.03	-.03	.18	-.36	-.07	-.08	-.02	.00	.25	1.00	
36	.02	-.22	.06	.04	.05	.03	.02	.04	.02	-.22	.38	.05	-.05	.02	.00	-.28	-.73	1.00
37	.06	.00	.48	.48	.15	.01	.42	-.02	-.04	.28	.32	.31	.47	-.03	.24	.10	-.12	.09
38	.05	-.03	.32	.33	.05	-.01	.27	-.04	-.05	.14	.21	.21	.32	-.04	.13	.03	-.08	-.09
39	.00	-.04	.23	.20	.14	-.01	.16	.02	-.03	.06	.28	.15	.20	-.03	.07	-.03	-.09	.07
40	.03	.04	.22	.17	.13	.05	.15	.04	-.01	.07	.20	.10	.15	-.04	.08	-.02	-.03	.02
41	.02	-.05	.37	.35	.14	.02	.24	-.01	.00	.16	.33	.28	.33	.03	.16	.02	-.15	.13
42	.06	.00	.21	.21	.04	-.02	.17	-.02	.00	.09	.22	.22	.21	.06	.10	.04	-.04	.07
43	-.03	-.03	-.01	-.02	.02	-.01	.02	.00	-.01	-.02	-.01	-.01	-.02	.01	.01	-.02	.00	.00
44	.04	-.03	-.05	-.05	-.02	-.01	-.08	.01	-.01	-.03	-.01	-.03	-.05	.01	-.05	-.02	.00	.00
45	.00	.04	-.06	-.05	-.02	.00	-.06	-.03	-.01	-.05	-.03	-.06	-.06	-.03	-.05	-.04	.01	-.01
46	.02	-.02	-.04	-.05	-.02	.03	-.06	-.03	.08	-.03	-.01	-.04	-.04	.00	-.04	-.03	-.02	.02
47	-.02	.01	.00	.00	.00	-.01	.0	.00	-.01	-.01	.03	.02	.02	.01	.02	.00	-.02	.02
48	.00	-.01	-.06	-.06	-.02	.01	-.06	-.01	.03	-.07	.02	-.05	-.06	-.01	-.03	-.06	-.06	.06
49	-.01	.01	-.03	-.06	.06	.00	-.09	.11	.01	.03	.02	-.03	-.06	.02	-.05	-.05	-.02	.01
50	-.04	-.03	-.04	-.04	.01	-.01	-.06	.01	-.01	-.04	.03	-.03	-.02	-.02	-.03	-.04	-.04	-.04
51	-.02	-.05	-.03	-.06	.04	.00	-.08	.05	.02	-.06	.09	-.02	-.03	-.01	-.04	-.07	-.06	.08
52	.01	-.03	.16	.14	.09	.01	.11	.00	.01	.03	.20	.12	.13	.01	.06	-.05	-.10	.09

contd... 1

Variable No.	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
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36																
37	1.00															
38	.37	1.00														
39	.27	.20	1.00													
40	.40	.21	.27	1.00												
41	.46	.22	.16	.16	1.00											
42	.27	.16	.12	.06	.25	1.00										
43	-.02	.02	.10	.01	.05	.00	1.00									
44	-.08	-.05	-.03	-.03	-.05	-.01	.03	1.00								
45	-.08	-.03	-.05	-.04	-.04	-.01	.00	-.01	1.00							
46	-.06	-.03	-.03	-.03	-.02	.01	.00	.00	.21	1.00						
47	.01	.02	.04	.0	.07	.00	.02	.00	.00	.00	1.00					
48	-.08	-.01	.09	.01	.00	-.05	.22	.00	-.02	.09	.25	1.00				
49.	-.08	-.01	.03	.00	-.01	-.02	.01	-.01	.01	-.01	-.01	.37	1.00			
50	-.03	.04	.02	.02	.05	-.04	.18	.00	.00	.07	.25	.25	.13	1.00		
51	-.03	.00	.07	.05	.07	-.03	.20	.00	.00	.17	.18	.40	.23	.60	1.00	
52.	.21	.15	.37	.23	.40	.26	.72	.04	.15	.18	.16	.58	.24	.25	.35	1.00

Table 2. Intercorrelation matrix of the seven items in the final scale

Variable No.	1	43	47	48	50	51	52
1	1.00						
43	0.00	1.00					
47	0.07	0.02	1.00				
48	0.06	0.22	0.25	1.00			
50	0.08	0.18	0.25	0.25	1.00		
51	0.13	0.21	0.18	0.40	0.60	1.00	
52	0.23	0.72	0.16	0.58	0.25	0.35	1.00

Table 3. Item-total correlations and communalities of the seven items in the final sacle

Item No.	Correlation with total score	h^2	Name of the item
50	998	.628	No. of goats reared so far
51	.645	.686	Goat rearing experience (in years)
52	.312	.789	No. of all animals
48	.318	.660	No.of goats
47	.258	.462	No.of ducks
43	.255	.561	No. of sheep
1	.117	.376	No. of males

economic status on the basis of the scale constructed as mentioned earlier. The classification by both methods was the same. Thus, the scale was found to be valid.

The scale was also analysed with respect to reliability by the split-half technique and the reliability was found to be acceptable (reliability coefficient = 0.98). The 54 known-group members as mentioned above were also subjected to a retest. The test-retest reliability was found to be perfect (reliability coefficient = 1.00).

Implications for future research

It was clear that villages are differentiated by the degree of their development. In areas like the one studied here, crop farming might not be as remunerative in terms of economics and also in terms of nutritional requirements as compared to animal farming. It was significant that in the socio-economic status scale developed in the present study, six out of seven items were related to animals including birds. It was clear, therefore, that in such areas, emphasis in extension work should be laid on animals and birds. Moreover, in the delineation of agro-climatic zones, sufficient emphasis should be laid on animal (including birds) farming and its productivity.

At what point of time or stage of development did animal farming gave way to land holding and other non-animal parameters in the determination of socio-economic status? This question should be probed in future research. In this, special attention should be paid to shifting cultivation practices, yak and mithun husbandry.

What was the place of large organized poultry farms in the rural areas as far as socio-economic status was concerned? Did the dominant type of farming determine food habits of the particular area?

Results of the present study showed that there was only one factor in socio-economic staus. Other studies had revealed two and three factors. Did the number of factors in socio-economic status change with a change in the development stage of a society? This needed further research.

In case of organized poultry farms, most such farms had come up in the hinterland areas of big cities like Hyderabad. What was the role of such farms in determining the socio-economic status of their owners? Did absentee-ownership affect this relationship? Such studies needed to be taken up in future.

What with the government's increasing emphasis on animal farming and with the steady growth in the poultry and dairy sectors, the role of animal farming in determining urban as well as rural socio-economic staus needed to be studied with changes over time. We also needed to keep data on the number of vegetarian and non-vegetarians over time and note the changes occuring therein among the domestic consumers. In which areas of the country and among which castes was non-vegetarianism changing the socio-economic status of the consumers?

The caste-bound and religion-bound farming of some species of animals was slowly undergoing a change. How would it go on in the future?

Was backyard poultry farming getting slowly replaced by organized poultry farming or not? The trends needed to be studied with longitudinal data.

The relationship between the speed of adoption of innovations in animal farming (including poultry) and the contribution of animal farming in socio-economic status needs to be studied in future.

APPENDIX-1

List of variables studied: 1. No. of male, 2. No. of females, 3. Sex of head of the family, 4. Occupation of head of the family, 5. Caste, 6. Whether member of any organization, 7. No. of unemployed members, 8. Whether source of irrigation is own or hired, 9. Education of head of the family (in year), 10. Class passed by the head of the family, 11. Average education of the family (in years), 12. Average education per male, 13. Average education per female, 14. Proportion of literates, 15. Proportion of males literate, 16. Proportion of female literate, 17. Average age, 18. Average age per male, 19. Average age per female. 20. Proportion of males, 21. Total land (in *bighas*), 22. Irrigated land (in *bighas*), 23. Unirrigated land (in *bighas*), 24. Barren land (in *bighas*), 25. Proportion of irrigated land, 26. Proportion of unirrigated land, 27. Proportion of barren land, 28. Land per family member, 29. Family size, 30. Total income (in thousands of rupees). 31. Income from farming, 32. Income from other source, 33. Income from farming per bigha, 34. Income pr family member, 35. Proportion of member in paid occupations, 36. Proportion of unemployed members, 37. No. of implements, 38. No. of organizations in which the head of the family is a member, 39. No. of cows, 40. No. of bullocks, 41. No. of buffaloes, 42. No. of he-buffaloes, 43. No. of sheep, 44. No. of donkeys, 45. No. of pigs, 46. No. of poultry, 47. No. of ducks, 48. No. of goats, 49. No. of bucks, 50. No. of goats reared so far, 51. Goat rearing experience (in years), 52. No. of all animals.

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Axiomatic Theory of Communication Behavior

Dipak De[1] and R.S.P. Singh[2]

ABSTRACT

An attempt has been made to formulate a macro theory of communication behaviour through the use of axiomatic technique. Nine variables representative of the three dimensions were included within the theoretical system. The selected variables were based on past resources and through the use of Q sort technique. These variables were socio-economic status, education, training, knowledge of communication techniques, use of channel, presentation skill, communication competence, interpersonal interaction, and innovation proneness. The postulates were selected on the basis of already established empirical findings and they were deduced from the conceptualization of communication behaviour. Empirical test of the postulates and hypotheses of this theory revealed that one variable namely innovation proneness was not systematically related to the other's in the system. Predictive analysis revealed that three variables namely, knowledge of communication techniques, communication competence, and interpersonal interaction were the sine qua non in the system.

The function of theorizing in communication research according to Gudykunst (1983) is (i) to predict, (ii) to explain or (iii) to control the phenomenon under study. The explanation - prediction - control view of theory is the characteristics of positivistic approach to theory building. The central aspect of theory has not got dominant place in theory construction. According to Dubin (1969) theories of social and human behavior address themselves to two distinct goals of science: i) prediction and ii) understanding. In the usual case of building theory in the behavioral sciences, understanding and prediction are not often achieved together, and it therefore becomes important to ask why? According to him prediction is concerned with outcomes and understanding is concerned with interaction among variables (the unit of a theory). Theorizing is necessary in communication research because of the need of conceptual frameworks which will give direction to the diverse research effort taking place within it. According to Gudykunst (1983) theorizing is necessary to understand the process of communication. He also argues that initial goal of theory in communication is understanding rather than prediction or control.

The axiomatic approach to theory building is one of the positive theories which refers to consisting of a propositional statements ranging from postulates to hypotheses with built in logical system for explaining and predicting social and human behaviours of an individual. According to Zetterberg (1965) the advantages of axiomatic format over the other theoretical model are (i) the concepts and postulates offer the most. Parsimonious summary of research findings, (ii) it has the highest plausibility per amount of empirical data, (iii) it helps to locate strategic research problems, (iv) the source of failure of an hypothesis is to meet empirical test may be efficiently discerned and (v) it permits clear distinction below propositions which are definitions and those which are hypotheses. Keeping the advatages of axiomatic theory building in mind, an attempt has been made to propose axiomatic theory of communication behavior of farmers.

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METHODOLOGY

Steps involved in axiomatic theory of communcation behaviour

Different authors (Zetterberg 1965, Schwirian and Prehn 1962, Hage 1972, and Singh 1975) have suggested different steps to be followed for constructing theory in an axiomatic format. But, the steps followed in the present study for constructing theory in an axiomatic format has been discussed in detail.

In an axiomatic theory building technique, first an idea or a social phenomenon is selected. By idea or social phenomenon to the problem of interest to the investigator in the present problem is communication behaviour of farmers. Theory then can be started in many ways. The simplest way to begin is to search for some theoretical concepts *i.e.* variables or characteristic to describe the social phenomena. The theoretical concepts are the foundation of any theory. The first task in constructing a theory, therefore is to find some concept to use in theoretical statements. The most useful kind of theoretical concept is the general variable, a continuum that applies to any culture and at any point of time to societies that have ceased to exist; those presently exist and have yet to come into existence. The concepts are basic and derived. Basic concepts are fundamental and derived concepts are obtained through combination of the basic concepts, in other words operationalisation of the fundamental concepts. Concepts are ways of perceiving phenomena. A clear concept offers the same meaning to all those who use it. In an ideal sense, concept to be used in a theory should be readily understandable to all others who are familiar with the general perspective of frame work.

To construct theory, an investigator has to define all concepts in their basic abstract as well as in their working/concrete term. Such explicit definitions would avoid confusion that might ensure in lack of concept clarity. An operational definition of an abstact concept usually consists of procedures explicate the activities to arrive at real world indications. These activities can include asking questions, observations, sensory perception etc.

The next building block of a theory is the system of proposition. However, much we can describe social phenomenon or with a theoretical concept, we cannot use it to explain or predict. To explain or predict we need a theoretical statement, a connection between two or more concepts. The key point in stating a proposition is that it must contain statements concerning the existence of concept to be used and these concepts must be stated in relational terms. Propositional statements are relational as well. Concepts are atoms of any theory and the theoretical statements are the bonds between them.

The next stage is to formulate a certain number to be the postulates of the theory. The postulates should be chosen so that all other hypothesses/the theorems should be capable of derivation from these postulates. Specifically, the postulates should be chosen so that they become consistent and independent. In other words, no postulate should contradict any other and no postulate should follow from any other postulate as a theorem/ hypothesis.

Then, if one would like to further verify the theory one should select a certain number of propositions to be tested empirically. If the empirical test is favorable and no mistake has been made in the derivation, one can claim empirical validity for the whole theory.

With this reasoning, and considering the advantages of axiomatic theory building, this technique has been adopted for theory construction whose procedure can be summarily put up as follows:

1. Select an idea or social phenomenon;
2. Selection of variables or theoretical concepts;
3. Definition of the concepts;
4. Formulation of postulates and hypotheses with appropariate statistical technique;
5. Testing of postulates and hypotheses;
6. Validation/verification of the theory.

The above discussed theoretical model has been used in constructing the theory of communication behaviour of farmers.

RESULTS AND DISCUSSION

Step 1 Selection of an idea or social phenomenon

The theory formulated here is a macro theory of communication behaior. It consists of information input, process and output. As a substantive domain, it deals with three dimensions namely input, process and output. A minimally adequate initial theory within the substantive domain of communication must treat variables representative of the three dimensions of communication behaviour.

Step 2 Selection of variables

Selection of variables was based on basic concepts, assumptions and derived concepts. The past studies of communication behavior of farmers have indicated about 93 variables related to communication behavior. The following criteria were used for selection of variables:

(a) All the non significant variables were rejected.

(b) All the positively significant variables were selected.

(c) Definitions of the variables were studied and it appeared that many of the variables could be clubbed together. Through these procedures 33 variables were eliminated and 60 variables remained for final selection.

(d) Finally the variables have been selected through Q-sort technique. The following variables were selected named as predictor variables:

1. Socio-economic status
2. Education
3. Training
4. Knowledge of communication techniques
5. Use of channel
6. Presentation skill
7. Communication competence
8. Interpersonal interaction
9. Innovation Proneness and communication behavior is the response variable.

Step 3: Definition of the concepts

As already stated, a clear concept offers the same meaning to all those who use it. Hence, it is essential to define the theoretical concepts of the above mentioned variables. The operational definitions have been given in the step-5 i.e., testing of postulates & hypotheses.

Socio-economic status

It refers to the position of a farmer occupies in comparison to others with respect to caste, occupation, education, family type and farming size, type of house, material possession, farm power, farm implements and social participation.

Education

It is the process through which an individual is able to comprehend the group relationship between facts and ideas, and between one idea and another, to place facts and ideas in a system of values and to see their relevance to one's own life and to his society.

Training

It is the process of inclucating knowledge, skill and attitude in an individual for keeping pace with the accelerating life involvement and the enlarging one's own capability.

Knowledge of communication techniques

It is defined as the awareness, extent and manner of use of elements of communication process.

Use of channel

It has been defined as the degree to which people and agencies are sought as sources of information.

Presentation skill

It has been defined as the ability of an individual to encode and decode the message for making effective communication.

Communication competency

It has been defined as the ability to make effective and appropriate communicative interaction.

Interpersonal interaction

It is defined as a communication situation in which one transmits message that is received by another one to act upon it in a face to face relationship in most of the cases.

Innovation proneness

It is degree to which an individual is interested in and desired to seek change in one's own enterprise.

Communication behaviors

It has been defined as a composite of information input, processing and output. Information input refers to all the activities performed by an individual for the acquisition of information from different sources. Information processing refers to all the activities performed by an individual for evaluation, storage and transformation of information in suitable form. Information output refers to dissemination of information to others.

Step 4: Formulation of postulates and hypotheses

The axiomatic technique function develops a relatively complex system of hypotheses. The next step followed for theory construction is the formulation of postulates and hypotheses.

A fundamental principle of an axiomatic technique is that given (n-1) postulates where 'n' equals the number of variables and given that all variables appear in at least one of the (n-1) postulates that all other hypotheses within the theoretical system may be deployed. The total number of postulates and hypotheses is therefore, n(n-1)/2. Thus in the present study with nine predictor variables and one response variable, there will be 9 postulates and 36 hypotheses to be tested 10 (10-1) 12 = 45(9+36).

Postulates

Postulates of the axiomatic technique are those assertions of relationships between the variables of the system which are chosen on the basis of existing empirical knowledge, or some justifiable deductive process. The postulates are chosen and stated in such as manner that all the logical possibilities of relationship among all of the variables in the system may be deduced from them. Also, the postulates must be such that no one postulate could be deduced from a combination of any two other postulates (Zetterberg 1965).

Postulates

(n-1) = 9 postulates were formulated. As the fundamental principle of formulating postulates stand in the formula (n-1) where n = number of variables. Formulated postulates are:

P1 = Higher the socio-economic status, higher the education.

P2 = Higher the education, higher the training;

P3 = Higher the training, higher the knowledge of communication techniques;

P4 = Higher the knowledge of communication techniques, higher the use of channel;

P5 = Higher the use of channel, higher the presentation skill'

P6 = Higher the presentation skill, higher the communication competence;

P7 = Higher the communication competence, higher the Interpersonal interaction;

P8 = Higher the interpersonal interaction, higher the innovation proneness.

P9 = Higher the innovation proneness, higher the communication behavior.

Hypotheses

By applying the deductive technique for formulating the hypotheses from postulates stated above, all the logical possible relationships between the variables in the system are deduced and presented below:

HO1 = Higher the socio-economic status, higher the training.

HO2 = Higher the socio-economic status, higher the knowledge of communication technique;

HO3 = Higher the socio-economic status, higher the use of channel;

HO4 = Higher the socio-economic status, higher the presentation skill.

HO5 = Higher the socio-economic status, higher the communication competence;

HO6 = Higher the socio-economic status, higher the Interpersonal interaction;

HO7 = Higher the socio-economic status, higher the innovation proneness.

HO8 = Higher the socio-economic status, higher the communication behavior;

HO9 = Higher the education, higher the knowledge of communication techiques;

HO10 = Higher the education, higher the use of channel;

HO11 = Higher the education, higher the presentation skill;

HO12 = Higher the education, higher the communication competence;

HO13 = Higher the education, higher the Interpersonal interaction;

HO14 = Higher the education, higher the innovation proneness;

HO15 = Higher the education, higher the communication behavior;

HO16 = Higher the training, higher the use of channel;

HO17 = Higher the training, higher the presentation skill;

HO18 = Higher the training, higher the communication competence;

HO19 = Higher the training, higher the Interpersonal interaction;

HO20 = Higher the training, higher the innovation process;

HO21 = Higher the training, higher the communication behavior;

HO22 = Higher the knowledge of communication techniques, higher the presentation skill;

HO23 = Higher the knowledge of communication technique, higher the communication competence;

HO24 = Higher the knowledge of communication technique, higher the interpersonal interaction;

HO25 = Higher the knowledge of communication technique, higher the innovation proneness;

HO26 = Higher the knowledge of communication technique, higher the communication behavior;

HO27 = Higher the use of channel, higher the communication competence;

HO28 = Higher the use of channel, higher the interpersonal interaction;

HO29 = Higher the use of channel, higher the innovation proneness;

HO30 = Higher the use of channel, higher the communication behavior;

HO31 = Higher the presentation skill, higher the interpersonal interaction;

HO32 = Higher the presentation skill, higher the innovation proneness;

HO33 = Higher the presentation skill, higher the communication behavior;

HO34 = Higher the communication competence, higher the interpersonal interaction.

HO35 = Higher the communication competence, higher the communication behavior;

HO36 = Higher the interpersonal interaction, higher the communication behavior.

These hypotheses are syllogistically deduced from postulates. Together, the postulates and hypotheses are the propositions of the theory which are subjected to empirical tests.

Step 5 Testing of postulates and hypotheses

To test the developed postulates and hypotheses an ex post facto research technique was followed. The study was conducted in the Ramgarh block of the Alwar district of Rajasthan. Ramgarh block is consisted of 78 villages. Out of 78 villages, four villages namely: Nariana, Boraj, Kair and Khartal were selected by random sampling techniques. Out of the exhaustive list of the farmers in the four villages 100 farmers were finally selected by the random sampling technique.

Measurement of response and predictor variables

Response variable- Communication behavior

It has been operationally defined as an index which is an aggregate of scores obtained on information input index, processing index and output index of an individual. It has been measured with the help of an index developed by Vijayaragavan (1976).

Predictor variables

1. Socio-economic status

Operationally it refers to the items namely - caste, occupation, education, family size and family type, social participation, land holding, house, farm power, farm implements, material possession. It has been measured with the help of a scale developed by Trivedi (1963).

2. Education

It has been operationalized as number of years of formal education attended by the individual. It is measured with the help of scale developed by Trivedi (1963).

3. Training

Operationally it refers to number of years all types of training attended by an individual. It was measured with the help of a schedule specially developed for this study.

4. Knowledge of communication technique

It has been operationalized as the knowledge of an individual about the elements of communication process. It has been measured with the scale developed by Sobhana (1990).

5. Use of channel

Operationally it refers to the accessibility and suitability of the channel. It has been measured as per the scale developed by Sobhana (1990).

6. Presentation skill

Operationally it has been defined as the use of simple and local words, clarity of voice, maintaining logical sequence, need based timely and accurate information and dealing with practical problems. It has been measured with the help of a scale developed by Sobhana (1990).

7. Communication competence

Operationally it refers to the ability of an individual to plan and organize communication activities. It has been measured by the scale developed by Sobhana (1990).

8. Interpersonal interaction

Operationally it refers to face to face interaction between and among individuals. It has been measured with the help of a scale developed by Bhople (1985).

9. Innovation proneness

Operationally it refers to the degree of an individual's desire to seek change. It has been measured with the help of a scale developed by Chaudhary (1973).

The data were collected with the help of a schedule specially constructed for the study proposes. The statistical methods employed for testing postulates and hypotheses were namely correlation and regression. The level of probability of the acceptance or rejection of postulates and hypotheses was on 0.01 and 0.05.

Relationships among the variables were tested with the help of zero order correlation. the Intercorrelation matrix has been given in Table 1.

The data had rejected two postulates and seven hypotheses and accepted seven postulates and twenty nine hypotheses. Accepted postulates and hypotheses are as follows :

P1 = Higher the socio-economic status, higher the education;

P2 = Higher the education, higher the training;

P3 = Higher the training, higher the knowledge of communication techniques;

P4 = Higher the knowledge of communication techniques, higher the use of channel;

P5 = Higher the use of channel, higher the presentation skill;

P6 = Higher the presentation skill; higher the communication competence;

P7 = Higher the interpersonal interaction, higher the innovation proneness.

Hypotheses:

HO1 = Higher the socio-economic status, higher the training;

HO2 = Higher the socio-economic status; higher the knowledge of communication techniques;

Table 1. Inter-correlation matrix

	1	2	3	4	5	6	7	8	9	10
(1)	SES	1.000								
(2)	ED	0.651	1.000							
(3)	TR	0.593	0.460	1.000						
(4)	KCT	0.548	0.573	0.433	1.000					
(5)	UC	0.422	0.483	0.329	0.873	1.000				
(6)	PS	0.563	0.597	0.446	0.678	0.554	1.000			
(7)	CC	0.536	0.483	0.526	0.626	0.564	0.652	1.000		
(8)	IPI	0.177	0.265	0.138	0.047	0.089	0.217	0.195	1.000	
(9)	IP	-0.32	-0.030	0.119	-0.36	-0.16	-0.010	0.003	0.004	1.000
(10)	CB	0.486	0.447	0.420	0.692	0.609	0.646	0.625	0.104	1.000

HO3 = Higher the socio-economic status, higher the use of channel;

HO4 = Higher the socio-economic status, higher the communication competence;

HO5 = Higher the socio-economic status, higher the interpersonal interaction;

HO6 = Higher the socio-economic status, higher the communication behavior.

HO7 = Higher the education, higher the knowledge of communication techniques;

HO8 = Higher the education, higher the use of channel

HO9 = Higher the education, higher the presentation skill;

HO10 = Higher the education, higher the communication competence;

HO11 = Higher the education, higher the interpersonal interaction;

HO12 = Higher the education, higher the communication behaviour

HO13 = Higher the training, higher the use of channel;

HO14 = Higher the training; higher the presentation skill;

HO15 = Higher the training, higher the communication competence;

HO16 = Higher the training, higher the interpersonal interaction;

HO17 = Higher the training, higher the innovation proneness

HO18 = Higher the training, higher the communication behaviour;

HO19 = Higher the knowledge of communication technique, higher the presentation skill;

HO20 = Higher the knowledge of communication technique, higher the communication competence;

HO21 = Higher the knowledge of communication technique, higher the interpersonal interaction;

HO22 = Higher the knowledge of communication technique, higher the communication behaviour;

HO23 = Higher the use of channel, higher communication competence;

HO24 = Higher the use of channel, higher the interpersonal interaction;

HO25 = Higher the use of channel, higher the communication behaviour;

HO26 = Higher the presentation skill, higher the interpersonal interaction;

HO27 = Higher the presentation skill; higher the communication behaviour;

HO28 = Higher the communication competence, higher the communication behaviour;

HO29 = Higher the interpersonal interaction, higher the communication behaviour.

Rejected postulates and hypotheses are as follows:

P1 = Higher the interpersonal interaction, higher the innovation proneness;

P2 = Higher the innovation proneness, higher the communication behaviour

Hypotheses:

HO7 = Higher the socio-economic status, higher the innovation process;

HO14 = Higher the education, higher the innovation proneness;

HO20 = Higher the training, higher the innovation proneness;

HO25 = Higher the knowledge of communication technique, higher the innovation proneness;

HO29 = Higher the use of channel, higher the innovation proneness;

HO32 = Higher the presentation skill, higher the innovation proneness;

HO34 = Higher the communication competence, higher the innovation proneness.

To develop predictive axiomatic theory, the technique of multiple regression was used. This technique was used to determine the effect of the

predictor variables on response variable i.e. communication behaviour. The findings have been presented in the Table 2.

It is evident from the Table 2 that the nine predictor variables taken together explained to the extent of 59.2 per cent of the variation in communication behaviour of farmers. The respective 'F' value (significant at 1 per cent level) at degrees of freedom given in parenthesis was 34.52 (9.0). Thus, the results implied that all the nine predictor variables would account for a highly significant amount of variation in the communication behaviour of farmers.

From the above observations 't' test of significance indicates that the coefficients of regression (b value) are found significant only for knowledge of communication technique (X 8). It is also evident from the table that variable (X2) education, variable (X3) traning, variable (X5) use of channel, variable (X6) presentation skill have got negative regression coefficients. Negative regression coefficient for variables education (X2), training (X3), and use of channel (X5). Presentation skill (X6) (though statistically non-significant) are contrary and unaccountable or unexpected. However, from the correlation tables (no 2 to 11) it is very clear that these predictor variables one to nine are highly correlated with each other. The high correlations among the variables introduce the effect of multi-collinarity.

To remove the effect of multi-collinarity by dropping non-significant variables a step down regression analysis was carried out which finally resulted in the regression equation as, X4 knowledge of communication technique X7 communication competence and X8 Interpersonal Interaction, predictor variables are included in the final multiple regression equation is set 2.

Setp 2 : Multiple regression equation with significant predictor variables related to communication behavior of farmers.

The communication behaviour of farmer has been assessed by the significant variables from set 1 which have been incorporated in Table 3.

From Table 3, it is obvious that a multiple regression equation with three predictor variables explained to the extent of 56.6 per cent of variation in communication behaviour of farmers. The 'F' value was 41.75 and 3 and 96 degrees of freedom which was significant at 0.01 level of probability. It was, therefore, indicated that the three finally selected predicator variables explained a highly significant amount of variation in the communication behaviour of farmers.

Comparison between Table 2 and 3 shows that there is a little difference in the values of percentage of variation explained by the regression equation. Regression coefficient for Knowledge of Communication

Table 2. Multiple regression analysis of nine predictor variables with the response variable, communication behaviour

S. No.	Characteristics	b value	S.E. of b	t value
1.	Socio-economic status	0.105	0.12	0.90NS
2.	Education	0.973	1.27	0.77NS
3.	Training	01.485	5.27	0.09NS
4.	Knowledge of communication techniques	1.22	0.39	3.45**
5.	Use of channel	0.170	0.90	0.19NS
6.	Presentation skill	0.007	0.12	0.06NS
7.	Communication competence	1.07	0.37	2.93*
8.	Interpersonal interaction	1.876	0.87	2.15*
9.	Innovation proneness	2.38	1.33	1.79NS

R^2 - 0.592; a (intercept constant) = 5.364; F = 34.52** with 9.90 d.f.; NS = Non significant.
** Significant at 0.01 level; * Significant at 0.05 level.

Table 3. Multiple regression equation with significant predictor variables related to communication behaviour

S. No.	Significant predictor variables	b value (RC)	S.E. of b value	t value for b
1.	Knowledge of communication techniques	0.070	0.018	3.827**
2.	Communication competence	0.093	0.031	2.934**
3.	Interpersonal interaction	0.056	0.026	2.144*

R^2 - 0.566; a (intercept constant) = 4.901; F value = 41.757** with 3.96 d.f.; NS = Non significant.
** Significant at 0.01 level; * Significant at 0.05 level.

Technique (X4), communication competence (X7) and Interpersonal Interaction (X8) are most important and they are in order of Knowledge of Communication Technique (X4), communication competence (X7) and interpersonal interaction (X8) and they are stable too. The prediction analysis brought out the importance of selected predictor variables viz. Socio-Economic Status, Training, Knowledge of Communication Technique, Education, Presentation Skill, Interpersonal Interaction, Communication Competence, Innovation Pronneness and Use of Channel characteristics of farmers influencing the communication behaviour. After eliminating non significant ones the significant variables were selected for predicting the communication behaviour of farmers. The variation due to these were almost nearer to that obtained by the entire set of nine variables, indicating that the remaining variables did not contribute significantly in explaining the variation in communication behaviour. The three variables explaining more than 56 per cent variation in communication behaviour of farmers were knowledge of communication technique, communication competence and interpersonal interaction.

Thus it could be inferred that the communication behaviour of farmers can be predicted from the knowledge of communication technique, communication competence and interpersonal interaction.

Step 6: Validcation of the theory

The conditioins for the validation of the theory are that i) empirical test must be favourable and ii) no mistake has to be made in the derivation while formulating postulates and hypotheses in the present study. All the above mentioned conditions were fulfilled and it can be claimed as an empirical validity for the whole theory. Therefore, we can propose an axiomatic theory based on empirical verification and validation of the whole theory.

Reformulated theory

Higher the knowledge of communication techniques, communication competence and interpersonal interaction, higher the communication behaviour.

The findings have been able to bring about the causal effect of different predictor variables on response variable. It has been adequately observed that knowledge of communication technique, communication competence and interpersonal interaction are important predictor variable in the sphere of communication behaviour. knowledge of communication technique in any sphere provides adequate strength to the innate faculty of an individual or a group to think of the pros and cons of phenomena and to take a considerable decision on it. Those who are having ability to organize a plan the communication activities are more competent in communication leading them into more interactional process between and among individuals in a face to face situation. Hence, it is quite natural that these variables have exercised a conspicuous role in the communication behaviour of farmers.

Conclusion can be drawn from the prediction analysis that the knowledge of communication technique, communication competence and interpersonal interaction are the most contributing factor for the communication behaviour of farmers. Therefore, the three predictor variables viz., knowledge of communication technique, communication competence and interpersonal interaction are the sine qua in communication behaviour of farmers.

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Development and Testing of Interactive Electronic Media on Beekeeping

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ABSTRACT

An interactive CD-Rom in Hindi along with printed version and documentary was prepared as it is a highly useful information storage device. Standard steps for preparation of CD-Rom were followed. The prepared interactive media was found to be effective for all the parameters as high mean scores for almost all the messages were obtained.

Beekeeping has great scope in our country to develop as prime agro-horticulture based rural cottage industry, ideally suited to the rural, tribal, youth and other categories of the weaker sections of society. In Haryana, beekeeping is a relatively recent phenomenon but it has been gaining popularity among farmers. The climatic conditions and flora in some parts of Haryana are suitable for adopting bee keeping on commercial basis. The potential of beekeeping for income generation is beginning to be realized by Government and non-Governent agencies, beekeeping associations and extension services which are looking at ways of improving small scale beekeeping by building on people's knowledge and skill.

In this age of information revolution, new technologies are revolutionizing the field of education. The devices such as computers, internet and video which seemed far flung a few years back are now available in rural areas. Hence, there is a need to design suitable and relevant media for rural masses so as to make learning experience more pleasurable, easier, understandable and long lasting. As the technology reaches the villages, more and more people are likely to undertake commercial beekeeping. CD-ROM and other forms of multimedia have now become very popular among trainers as a handy reference for making training programmes more effective. Further individual farmers, educated unemployed youth and anybody who is interested in undertaking this enterprise can make use of this media for interactive self-learning. Therefore, keeping this factors in mind, the present study was planned to design, develop and standardize interactive CD-ROM on beekeeping.

METHODOLOGY

An interactive CD-Rom in Hindi along with printed version and documentary was planned, as it is a highly useful information storage device. Standard steps for preparation of CD-Rom 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 referred 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 messages were broken down into subsequent critical sub messages. The front page (HOE) 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 many times for reviewing, after which the final text was published in Microsoft Flash Programme and recorded in CD-Rom.

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The media so prepared were subjected to 30 judges to assess their effectiveness. The effectiveness of CD was measured through modified scale of Midha 2001 on selected parameters such as accuracy, coverage, objectivity, contents presentation, illustrations, linking, compatibility, understandability. 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.

RESULTS AND DISCUSSION

Accuracy of various beekeeping messages for CD perceived by judges

Accuracy of beekeeping messages was assessed under six attributes of accuracy. Table 1 indicates that accuracy in terms of 'understanding of the title', 'free from grammatical spelling and other typographical errors', 'clarity of printing', 'size of typing', 'appropriateness of language', 'clarity of directions', was perceived to be high for all the messages viz., 'Importance of beekeeping' (M_1); 'Preliminary information about the beekeeping' (M_2); 'Identification of bee diseases, enemies and their control' (M_7); 'Management of bee colonies in different seasons' (M_6); 'Hive products and their values' (M_4); 'Honey extraction, filtration, storage and sale' (M_8); 'Bee colonies examination' (M_5) and 'Economics of beekeeping' (M_{10}). Whereas accuracy in terms of understanding of the title was found perfect for M_1, M_2, M_3, M_6, M_7 & M_8.

Regarding 'free from grammatical spelling and other typographical errors' maximum score was given to M_1 and M_5, least score was given to M_7 and M_8 may be because of presence of technical words in the message. 'Clarity of printing', size of typing' and 'appropriateness of language' was perceived high for all the messages. 'Clarity of directions' scored maximum for M_1 and the least for M_7.

Overall weighted mean score showed that 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 various beekeeping messages for CD as perceived by judges

The data presented in Table 2 reveals that coverage of information on beekeeping was found to be high for all the messages and the mean score for ten messages ranged between 2.82 to 2.98. M_3 scored highest for coverage of various topics followed by M_5 and M_9. Other messages, M_5, M_6, M_7, M_4, M_9, M_2 and M_{10} also scored high for coverage. Thus it clearly indicates that contents related to these messages were covered properly by all the topics.

As regards objectivity high scores were obtained for 'write up of all the messages clearly stated/self explanatory' attributes for all the messages, maximum for M_3 and minimum for M_9. Similarly 'information appears to be valid and well researched' also scored high for all the messages.

It is further revealed from Table 2 that overall 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_9. 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 of various beekeeping messages for CD as perceived by judges

Overall mean scores related to content presentation are presented in Table 3. The data clearly indicates that as far as judges' opinion on its attributes was concerned they reported that the attributes 'material managed in a logical sequence and grouping', scored high score for all the messages, maximum for M_4. 'Usefulness of the information' and 'searching the links of files easily', were perceived to be high because these two parameters attained maximum mean score value (ranging 2.84 to 2.99) for all the messages indicating that no change was required as far as these parameters were concerned.

As far as ease in reading was concerned, comparatively low mean scores were achieved for M_3, M_5, M_8, M_9 and M_{10}. It may be due to reason that messages like enemies and disease were more scientific and had technical information thus slight modification was done to increase its effectiveness in terms of readibility. The 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 & M_8.

Illustrations of various beekeeping messages for CD as perceived by judges

The data in Table 4 clearly indicates that overall effectiveness in terms of illustration of various messages related to CD was perceived to be high (ranging from 2.88

Table 1. Accuracy of various beekeeping messages for CD perceived by judges

Sr. No.	Attributes of Accuracy	Weighted mean score									
		Messages									
		M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
1.	Understanding of the title	3.0	3.0	3.0	2.89	2.92	3.0	3.0	3.0	2.93	2.96
2.	Free from grammatical spelling and other typographical errors	2.91	2.74	2.83	2.84	2.91	2.81	2.73	2.64	2.76	2.85
3.	Clarity of printing	2.93	2.91	2.90	2.94	2.89	2.96	2.92	2.93	2.91	2.88
4.	Size of typing	2.86	2.88	2.91	2.86	2.85	2.88	2.89	2.90	2.94	2.83
5.	Appropriateness of language	2.95	2.86	2.78	2.86	2.84	2.81	2.75	2.87	2.86	2.89
6.	Clarity of directions	2.98	2.81	2.85	2.96	2.88	2.93	2.66	2.69	2.88	2.79
	Overall mean score	2.93	2.86	2.87	2.91	2.88	2.89	2.82	2.83	2.88	2.86

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

Table 2. Coverage and objectivity of various beekeeping messages for CD as perceived by judges.

Sr. No.	Attributes of coverage and objectivity	Weighted mean score									
		Messages									
		M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
A.	Coverage										
	1. All topics covered the concept of beekeeping	2.91	2.90	2.98	2.88	2.97	2.91	2.91	2.90	2.94	2.82
B.	Objectivity										
	1. Write up of all topics/messages clearly stated/ self explanatory	2.83	2.74	2.86	2.82	2.73	2.82	2.71	2.83	2.62	2.71
	2. Information appears to be valid	2.83	2.72	2.81	2.72	2.81	2.74	2.81	2.84	2.83	2.72

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

Table 3. Content presentation of various beekeeping messages for CD perceived by judges

Sr. No.	Attributes of content presentation	Weighted mean score									
		Messages									
		M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
1.	Material managed in logical sequence and grouping	2.89	2.89	2.88	2.91	2.89	2.88	2.86	2.88	2.89	2.88
2.	Usefulness of information	2.96	2.98	2.95	2.94	2.96	2.86	2.96	2.99	2.96	2.98
3.	Ease in reading	2.98	2.95	2.84	2.96	2.84	2.84	2.84	2.74	2.86	2.82
4.	Links of files easily searchable	2.97	2.96	2.89	2.94	2.96	2.96	2.84	2.86	2.98	2.94
	Overall mean score	2.95	2.94	2.89	2.93	2.91	2.88	2.87	2.86	2.92	2.90

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

Table 4. Illustrations of various beekeeping messages for CD as perceived by judges

Sr. No.	Attributes of Accuracy	Weighted mean score									
		Messages									
		M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
1.	Layout of pictures/illustrations/graphics is appropriate	2.93	2.90	2.88	2.85	2.89	2.96	2.84	2.97	2.89	2.92
2.	Suitability of pictures/illustrations to contents	2.98	2.96	2.94	2.93	2.92	2.94	2.93	2.90	2.90	2.85
	Overall mean score	2.95	2.93	2.91	2.89	2.90	2.94	2.88	2.93	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 5. Writing style and compatibilityof varioius beekeeping messages for CD perceived by judges

Sr. No.	Attributes of writing style and compatibility	Weighted mean score									
		Messages									
		M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	M_9	M_{10}
A.	Writing style										
1.	The main points were more emphasized	2.93	2.94	2.96	2.97	2.86	2.94	2.88	2.84	2.88	2.86
2.	All the topics/main headings are differential from each other	2.96	2.96	2.98	2.99	2.96	2.92	2.90	2.96	2.95	2.96
3.	Topics or information of messages are simple in nature	2.98	2.95	2.98	2.96	2.84	2.84	2.89	2.84	2.90	2.92
4.	Repetition avoided	2.89	2.88	2.90	2.95	2.91	2.84	2.80	2.86	2.89	2.94
	Overall mean score	2.94	2.93	2.95	2.96	2.89	2.91	2.86	2.87	2.90	2.92
B.	Compatibility										
1.	Presentation of various messages is according to audience background	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

to 2.95) for all the messages. Though comparatively low weighted mean score was achieved by M_7 and M_{10} i.e. 'Identification of bee diseases and their control' and 'Economics of beekeeping' which indicated that layout of pictures, illustration, suitability of picture and illustration to content need to be modified. Thus, modification was done for this message. The table thus clearly reveals that both layout and suitability of pictures was perceived high for all the ten messages. 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.

Writing style and compatibility of various beekeeping messages for CD perceived by judges

Regarding writing style it can be observed from Table 5 that majority of the judges observed that main points in CD were emphasized and all the headings were also differentiated from each other. It may be due to the reason that all heading and sub headings were properly linked with home page and in different colours resulting in case of searching the related contents. Majority of the judges opined that repetition of words (2.80-2.95) was avoided carefully and 'topic or information of messages are simple in nature'. 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 followed 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, interest, customs and value system.

CONCLUSION

The prepared interactive media *i.e.* CD Rom was found to be effective for all the parameters and was found to have high mean score for almost all the messages.

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Development of e-Learning Module on Mud Crab Fattening

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ABSTRACT

The e-Learning techniques have drastically changed the way of information dissemination especially in the field of agriculture and aquaculture. Today, e-Learning is fast becoming a reality through Information Communication Technology (ICT) projects like e-Choupal, I-Kisan, n-Longue, and Information Village Research Project of M.S. Swaminathan Research Foundation (MSSRF). Identifying information needs of Knowledge Centre users and aqua farmers at regular intervals followed by an appropriate e-learning module could be a viable strategy for the improvement of knowledge and skills. Based on the overall assessment of the Village Knowledge Centres (VKCs) in Pudhucherry, the asynchronous e-learning module in Tamil on mud crab (fattening) which has been identified as one of the species for diversification in brackishwater aquaculture was developed. The module addresses the needs of knowledge workers, knowledge centre users, aqua farmers, and extension educators for improving the knowledge and skills related to mud crab fattening.

The e-Learning techniques provided a fast and low-cost method to increase outreach to the vast community of users. The American Society for Trainers and Development (ASTD) defines e-learning as instructional content or learning experiences delivered or enabled by electronic technology. Electronic technology encompasses everything from Computer-Based Training (CBT), to compact disks (CDs), to Web-based applications (Werner, 2001). As with any other forms of learning, e-Learning depends on its delivery method and content to ensure its success. For this reason, e-Learning modules have to be interesting, interactive and informative in order to be effective. e-Learning can be done using an internet connection, a network, an intranet, or a storage disk (Mason, 1998).

Moreover, e-Learning can be done anywhere and anytime as long as the user has the proper hardware. Today, e-Learning is fast becoming a reality through ICTs projects like e-Choupal, I-Kisan, n-Longue and Information Village Research Project of M.S. Swaminathan Research Foundation (MSSRF) and others.

In e-Choupal and Information Village Research Project of M.S. Swaminathan Research Foundation (MSSRF), e-learning is enabled via synchronous (online) and asynchronous (offline) delivery system in respect of information on coastal aquaculture. In both ICT projects, synchronous e-learning takes place via web based videoconferencing, net meeting, audio conferencing with presentation material, and on-line chat. In e-Choupal Project users elicit the aquaculture information through internet based, network based on storage disk based, asynchronous e-learning modules.

MSSRF Information Village Knowledge Centre is in possession of asynchronous e-learning modules in the form of CDs in agriculture, horticulture, animal husbandry and value added products. To date, however, there is no asynchronous based e-learning module for aquaculture.

Information needs to be tailored to suit the needs of the Village Knowledge Centre (VKC) users in aquaculture. Based on the overall assessment of the Village Knowledge Centres in Pudhucherry, the asynchronous e-learning module on Mud Crab Fattening in Tamil was developed. The module addresses the needs of knowledge workers, knowledge Centre users, aqua farmers, and extension educators for improving the

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knowledge and skills related to one of the species for diversified aquaculture species i.e. fattening of mud crabs.

METHODOLOGY

The frame work for development of an e-learning module on mud crab fattening is depicted in Figure 1.

Needs Assessment

A field trip was undertaken to Pudhucherry during November 2006 and January 2007 to assess the information needs of users of Village Knowledge Centres. The investigation was carried out in four VKCs namely Veerampattnam, Pannithitu, Periyakalapet, and Ganapathychettikulam, which are located in coastal areas. At each Centre needs were assessed through structured questionnaire.

In order to identify the information needs, the entire information needed on aquaculture had been divided into five categories viz., culture aspects, e-Aquaculture, extension activities, fisheries allied information, and base information. This includes awareness programmes, e-Learning module on different species, extension materials, marketing information, training on culture practices and value added products, information on coastal zone laws, acts and policies, information on fisheries related educational institutions and their course details, subsidies and other facilities given by government to the aqua farmers etc. This need assessment questionnaire was used for recording the responses of 103 sample VKCs users. The respondents were asked to give their responses on a three-point continuum, viz. mostly needed, some what needed and not at all needed (Sailaja and Reddy, 1999). After recording the responses from all users, the total rank score of each item was obtained by multiplying the frequencies with the respective weights and summing up. On the basis of rank score of each item, ranks were assigned to all the items to ascertain their importance.

During discussions, it was noted that the selection of communication channels, includes media and language, would depend on their availability to the different target groups and the preferences of the users of the knowledge centres.

Design and Development

The module structure was designed as simple as possible to deliver the required information to the end users, including the extension educators, about the significance of the mud crabs, their benefits and culture systems. For optimization of communication, very careful consideration was taken by the experts and designers to the messages to be conveyed to the target groups. Experts in mud crab fattening reviewed the materials prior to creation of an information base for this module. The information base in mud crab fattening was converted to asynchronous e-learning module via electronic format using variety of media like audio, text, images and animation. The module was designed to consider the limitations of the rural market, such as computer hardware and software. A simple module layout and limited animation and images allow for faster loading and access.

RESULTS AND DISCUSSION

Need assessment

Identifying information needs of users of knowledge centre and aqua farmers at regular intervals followed by an appropriate e-learning module could be a viable strategy for the improvement of knowledge and skills. The information needs of users of knowledge centre and aqua farmers in the order of ranking are presented in Table 1. On the basis of data presented in Table 1, it could be inferred that the mud crab fattening e-Learning module with a total rank score of 135 ranked first, followed by seabass e-Learning module (107), and shrimp e-learning module (103).

The users showed keen interest to know the different types of culture systems in brackishwater area, economics, contact addresses for training centres, hatcheries, exporters details, and banks, which are providing the loan facilities for mud crab fattening. The respondents suggested that Tamil was the preferred language for all users of centres. The knowledge workers expressed that the text attached with audio is suitable for illiterates. Media suggested for users of centres are asynchronous e-Learning module with auto-run facilities.

e-Learning module

The module was named Mud Crab Fattening (*Scylla Tranquebarica)*. This module offers the following main topics on mud crab fattening to users, viz. Introduction, culture systems and Contact addresses. In order to narrow the topics, these topics are subdivided into additional topics (Fig. 2).

The introduction topic provides information about salient features, basic details of mud crabs and its

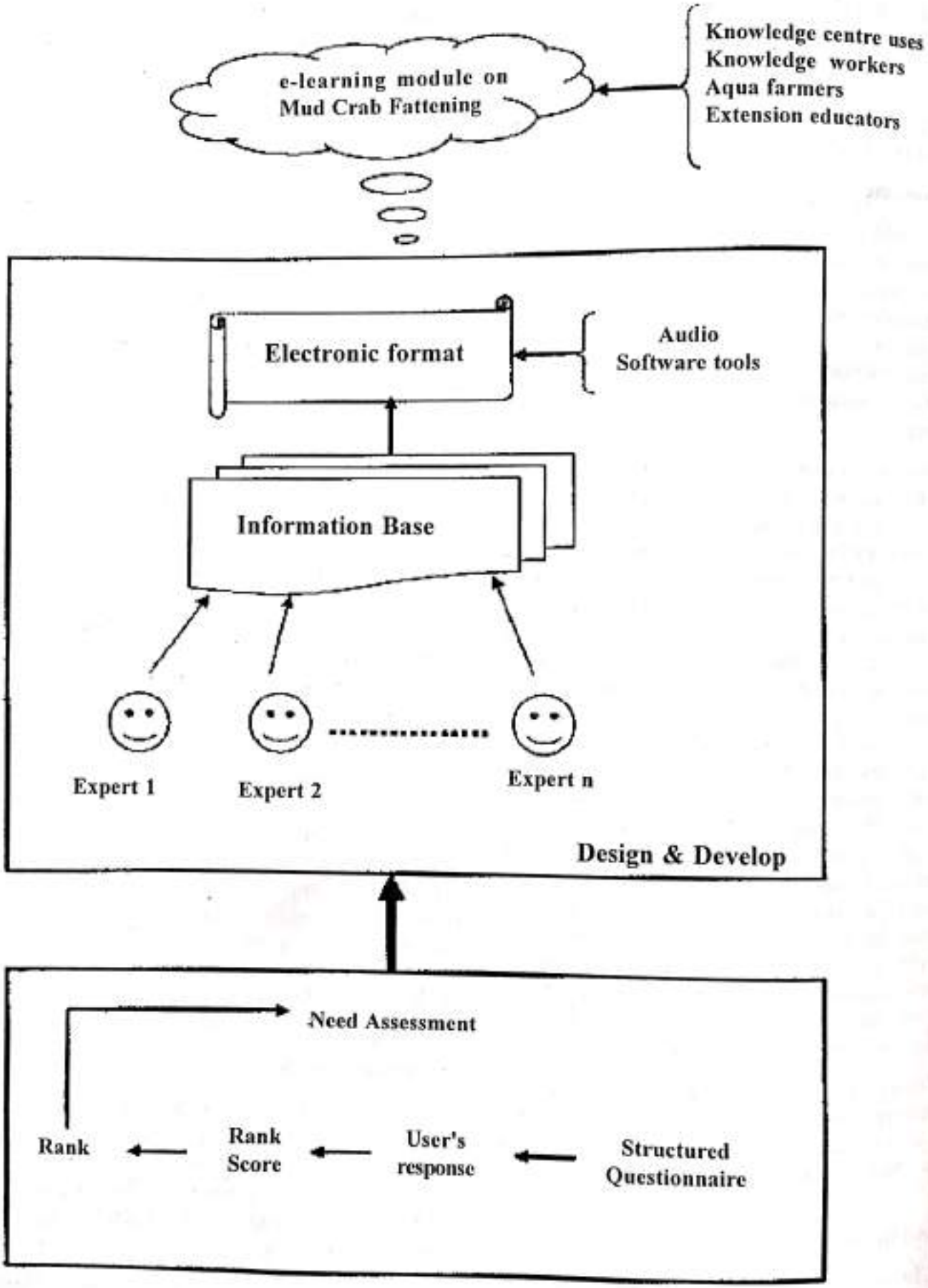

Figure 1. Frame work for development of an e-learning module on Mud Crab Fattening (*Scylla Tranquebarica*)

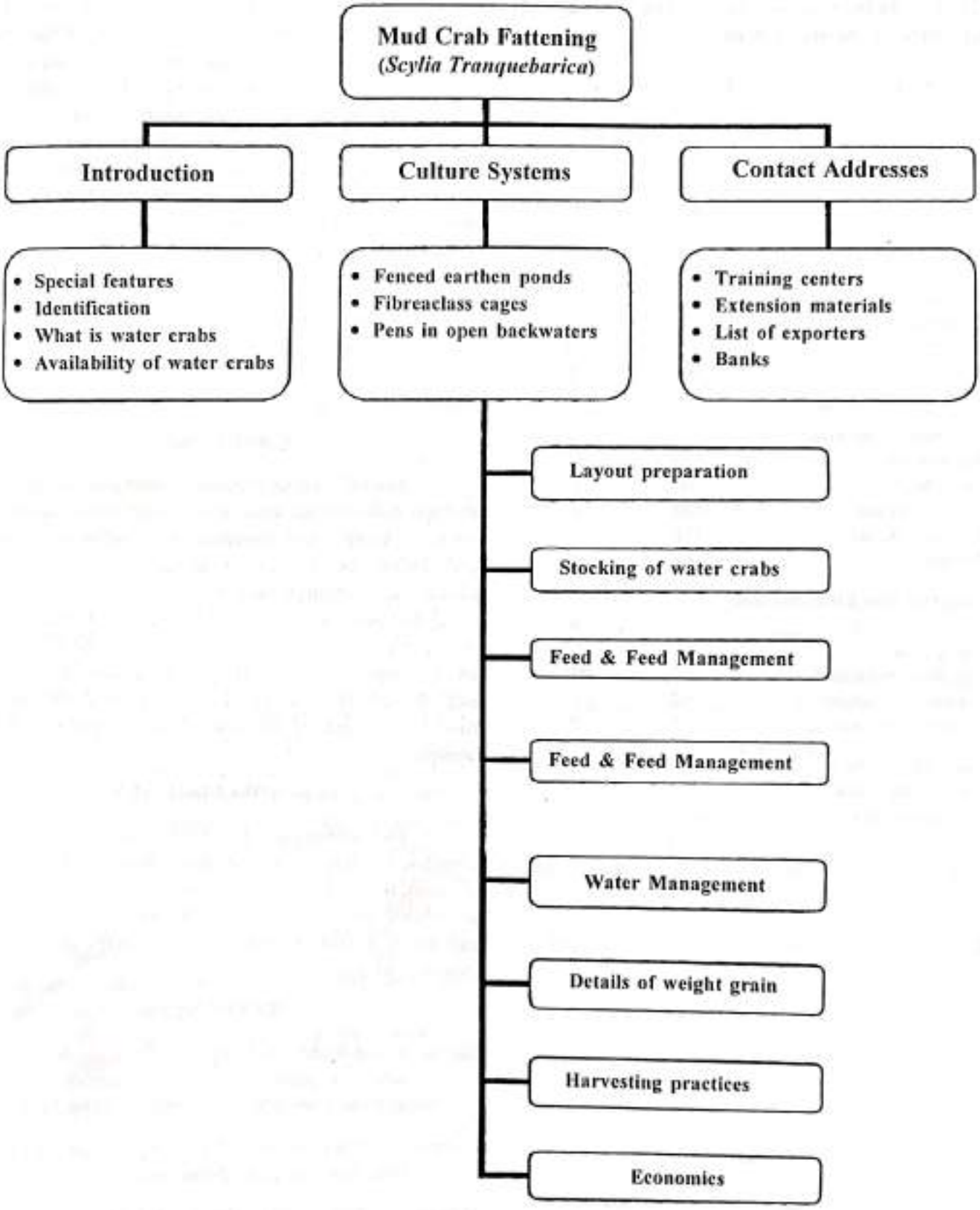

Figure 2. Structure of Mud Crab Fatting (*Scylia Tranquebarica*) e-Learning module

Table 1. Information needs assessment of aquaculture in the study area

Partiuclar	Total rank score	Rank
A. Awareness programme in culture aspects		
Shrimp	103	III
Seabass	109	II
Mud crab fattening	138	I
B. e-Learning module in aquaculture		
Shrimp	103	III
Seabass	107	II
Mud crab fattening	135	I
C. Extension activities		
Publications	119	II
Fact sheet	103	V
Training (Value)	135	I
Training (Mud)	110	III
Posters	108	IV
D. Fisheries allied information		
Ornamental fishing	120	V
Mangroves	131	IV
Dry fish preparation	137	III
Market information	200	I
Coastal zone laws, acts	173	II
E. Base information		
Address-education	223	III
Address-offices	256	I
Subsidies	226	II

availability. Users can look for information regarding three different types of culture systems in brackishwater area, such as "fenced earthen ponds", "fibreglass cages", and "pens in open backwaters". Each culture system is subdivided into areas covering layout preparation, stocking of water crabs, feed & feed management, water management, details of weight gain, harvesting practices, packing methods, marketing and economics. Layout preparation provides information about the requirements and designing structure for the culture systems. Feed & feed management highlights the types of feed, feed rate and timings. Harvesting methods provides information about gears used for harvest, harvesting by hand picking, and methods of handling of crabs. Containers used for packing the fattened crabs for transportation across the country and for exports were highlighted in the packaging methods topic. Detailed economics were given for each culture system. In addition to this, the module highlights water management and weight gain information. The page on contact addresses, lists the addresses, like training centres, the location of availability of extension materials, hatcheries, list of exporters, and banks. This is used as a ready reference volume for users.

In this module, messages are simple, clear and free of non-essential detail that may confuse target groups they provide only the needed information to the users of the centres, knowledge workers and extension educators.

CONCLUSION

The e-Learning module on mud crab fattening is an attempt to deliver accurate, high quality information in the form of simplified version to knowledge workers, knowledge centre users, aqua farmers, and extension educators. Although face to face meetings, workshops, group discussions and demonstrations remain the mainstay of extension, new technology and electronic media can provide opportunities to extension educators for innovative and cost-effective ways of information distribution to knowledge workers, knowledge centre users and aqua farmers.

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Early Transplantation of Rice in Punjab: Reasons and Some Suggested Measures

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ABSTRACT

Punjab has been making a significant contribution in the production of rice but due to its early transplantation, the declining water table has posed a serious problem. The study conducted on 135 respondents selected from six identified early rice transplantation pockets viz. Zira, Verka, Sultanpur Lodhi, Shahkot, Nadala and Samana revealed that availability of uninterrupted supply of electricity at sowing time, less occurrence of insect-pests and diseases at that time, easy availability of labour at low wages, prevalence of already existing early rice plantation practice, remunerative prices of the produce, etc. encouraged the farmers to go for early rice transplantation. A holistic approach based on extension, technology, legislation and policy measures needed to be followed besides discouraging farmers from early transplantation of rice.

Rice is the main kharif crop of Punjab State. With the introduction of improved package of technology coupled with increased irrigation facilities, it is being cultivated in all districts of the State. During the last two decades or so, the area and production under rice have increased five times and more than ten times, respectively. The State has been making significant contribution of 40 to 50 per cent to the central pool (Anonymous, 1995). Though rice is a remunerative crop for the farmers, yet the declining water table in the state has posed a serious problem. The water table in about two-third area of the State is declining at an alarming rate of 20 cm per year. Therefore, if the immediate steps to arrest the present trend of declining water table particularly in this part of the State are not taken, the agricultural productivity would be in great danger (Khepar and Sondhi, 1992). Keeping this in view, the present study was undertaken with the following specific objectives :

1. To determine the reasons for early transplantation of rice in Punjab.
2. To elicit suggestions from the respondents for checking early rice transplantation.
3. To design/frame suitable strategies to check early rice transplantation in the State.

METHODOLOGY

The study was conducted in purposively selected early rice transplantation pockets of Punjab. The pockets were identified with the help of extension personnel of the State Department of Agriculture and Farm Advisory Services (Punjab Agril. University, Ludhiana) at the district level. For the present study the early rice transplantation pocket was conceptualized as a contiguous area of 20 villages or more where atleast 50 per cent rice growing area is transplanted by the end of May. Thus, a total of six early rice transplantation pockets were identified throughout the State. A proportionate sample of 135 respondents was taken from the selected pockets for the purpose of the present study. The data were collected with the help of well structured and pre-tested interview schedule by personal of interview technique.

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RESULTS AND DISCUSSION

Reasons for early transplantations of rice crop

The reasons for early rice transplantation as expressed by the respondents are depicted in Table 1. A critical look at the data revealed that availability of uninterrupted supply of electricity at sowing time was the main reasons as expressed by 87.41 per cent of the respondents which otherwise would not have been possible if they had decided to go for timely sowing. More than three-fourths of the respondents (76.29%) reported that there was less occurrence/attack of insect-pests and disease at that time and there remains a sufficient availability of water for irrigation (57.03%).

About 50 per cent of the rice growers expressed that 'high intensity cropping pattern' (taking more than two crops) and 'easy availability of labour at low wages' were the other reasons for early rice transplantation. Prevalence of already existing early rice transplantation practice in the area also encouraged them to go for early rice transplantation (37.04%). Prolonged maturity period of Pusa-44 variety of rice and minimizing the losses due to floods were also the reasons for early rice transplantation. It was also evident from the data that early transplantation of rice facilitates marketing of the produce and can fetch better prices thus, influencing the farmers to go for early transplantation of rice. These findings were in agreement with those of Chatha *et al.* (1994) who reported that easy availability of labour at cheaper rates and greater supply of electricity were the main reasons for early rice transplantation.

Table 1. Reasons for early transplantation of rice crop

Reasons*	Pocket-wise number of respondents													
	Zira (n=25)		Verka (n=45)		Sultanpur (n=24)		Shahkot (n=10)		Nadala (n=10)		Samana (n=20)		Overall (N=135)	
	f	%	f	%	f	%	f	%	f	%	f	%	f.	%
Availability of uninterrupted supply of electricity at sowing time	21	84.00	44	97.78	18	72.00	9	90.00	7	70.00	19	95.00	118	87.41
Less occurrence of insects and diseases	23	92.00	30	66.67	14	56.00	10	100.00	7	70.00	19	95.00	103	76.29
Sufficient availability of water for irrigation	19	76.00	22	48.89	1	4.00	10	100.00	8	80.00	17	85.00	77	57.03
High intensity cropping pattern followed	1	4.00	44	97.78	16	64.00	4	40.00	2	20.00	-	-	67	49.63
Availability of labour at cheaper rates	15	60.00	24	53.33	8	32.00	6	60.00	4	40.00	9	45.00	66	48.89
Early rice transplantation prevalent in the area	17	68.00	8	17.78	4	16.00	2	20.00	8	80.00	11	55.00	50	37.04
To minimize losses due tofloods	-	-	-	-	22	88.00	-	-	-	-	-	-	22	16.29
Prolonged maturity period of Pusa-44	-	-	-	-	-	-	-	-	-	-	16	80.00	16	11.85
Facilitates marketing of the produce	-	-	-	-	2	8.00	1	10.00	-	-	8	40.00	11	8.15
The produce fetches better prices	-	-	-	-	-	-	-	-	-	-	1	5.00	1	0.74

* Multiple Response

After a cursory look at the pocket-wise distribution, the major reasons for early rice transplantation in the Zira, Shahkot and Samana pockets were found to be less occurrence of insects and diseases which needs to be critically examined by the scientists concerned through research trials in order to know the rationality of this reason. So far as Sultanpur Lodhi pocket was concerned, the main reason for easy rice transplantation was to minimize losses due to floods. This seems to be justified in the sense that the farmers were growing rice in low lying areas. As a result, the water accumulates/stagnates in their fields during monsoon season. That was why the farmers may be sowing early so that the rice plants attain sufficient height before the onset of monsoon. Regarding availability of labour at cheaper rates as one of the reasons, for early transplantation of rice, the study implied that efforts should be made by the scientists/ engineers of PAU, Ludhiana to design improved paddy transplanter as per the needs of the farmers and the same should be popularized for its use by the University and Extension Agencies of the State Department of Agriculture (Punjab) through conducting demonstrations at the farmers' along with the provision of subsidies for its purchase.

Suggestive measures for checking early rice transplantation

The suggestions for checking early rice transplantation were sought from the respondents and presented in Table 2.

A majority of the respondents (54.07%) suggested that there should be uninterrupted supply of electricity during the month of June (recommended time). Those who suggested that group meetings for popularizing timely rice transplantation be organized in the villages were 47.41 per cent. State Government should pass legislation prohibiting early sowing of rice and the same must be strictly implemented (22.96%). Short duration varieties of rice to be developed so that three crops could be taken in a year. Media should highlight the demerits of early rice sowing. Flood control measures in the low lying areas be undertaken by the Government, insect pest and disease resistant varieties be developed and there should be frequent power cuts during April-May to discourage early rice growers were some of the other suggestions for checking early rice transplantation in the State.

Strategies for checking early transplantation of rice in Punjab

A strategy in the present study has been operationalised as identified plan of action to be undertaken by the agencies concerned like Punjab Legislative Assembly (PLA); Punjab Agricultural University, Ludhiana (PAU), State Department of Agriculture (SDA), Punjab State Electricity Board (PSEB); Punjab State Marketing Board (PSMB) and Punjab State Irrigation and Drainage Department (PSID) with respect to policy measures, supplies, services, marketing etc. with a view to check the early rice transplantation.

The suggested strategies for checking early rice transplantation have been presented in Table 3 under the following three sub-heading:

a) Extension Strategy

b) Technological Strategy

c) Strategy based on Legislation and Policy measures

(a) Extension strategy

It comprises of the following aspects:

Conducting group meetings in the villages:

Village level group meetings in the early rice growing areas should be frequently conducted wherein the farmers should be familiarized with the advantages of the timely rice transplantation. They should also be taught that besides checking the falling water table in the State, timely rice plantation would fetch them higher yields more returns and facilitate procurement of their produce by the Government at pronounced prices.

Use of mass media

Mass media like newspapers, Radio, T.V., Video Films must highlight demerits of early sowing of rice. Punjab Agricultural University (P.A.U.) and the State Department of Agriculture, Punjab (S.D.A.) should prepare special video clips of 30 to 60 second duration for telecasting during the month of May, with the sole purpose of checking early rice transplantation in the State. These films should be shown repeatedly on the Doordarshan Kendra, Jalandhar and Cable Channels before the sowing season of rice in Punjab.

Training of extension personnel

P.A.U. and S.D.A. should trail the Field Extension functionaries dealing with the farmers regarding the challenging task of checking early rice transplantation. The

Table 2. Respondents' suggestions for checking early rice transplantation

Suggestions	Pocket-wise number of respondents													
	Zira (n=25)		Verka (n=45)		Sultanpur (n=24)		Shahkot (n=10)		Nadala (n=10)		Samana (n=20)		Overall (n=135)	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Uninterrupted supply of electricity during the month of June may be ensured	22	88.00	12	26.67	21	84.00	5	50.00	4	40.00	9	45.00	73	54.07
Group meetings for popularizing timely rice plantation among the farmers shouild be organized in the villages	13	52.00	10	22.22	18	72.00	8	80.00	4	40.00	11	55.00	64	47.41
Government legislation not to sow the rice earlier maybe passed and implemented	6	24.00	20	44.44	5	20.00	-	-	-	-	-	-	31	22.96
Short duration varieties of rice should be developed so that three crops are grown ona field during a year	-	-	25	55.56	-	-	-	-	1	10.00	1	5.00	27	20.00
Media should highlight the demerits of early sowing of rice	5	20.00	9	20.00	-	-	2	20.00	2	20.00	4	20.00	22	16.29
Flood control measures need to be taken by the Govt. so that farmers are able to transplant rice timely in the low lying areas	-	-	-	-	19	76.00	-	-	-	-	-	-	19	14.07
Insect and disease resistant varieties should be developed to sow the timely grown crop	4	16.00	9	20.00	-	-	-	-	-	-	-	-	13	9.63
There should be frequent power cuts during April-May	-	-	1	2.22	-	-	-	-	-	-	-	-	1	0.74

training should include conducting of group meetings in villages and handling of audio-visual devices like Video, Video Cassette recorders (VCRs), Film Projector, Computer, etc. Research based data highlighting the demerits of early rice transplantation, specialized nursery raising (Mat type seedlings) for the paddy transplanters, and in actual working of these mechanical devices, etc. The training should enable extension workers to successfully conduct demonstrations of paddy transplanters on the farmers' fields.

Table 3. Suggested strategies to check early rice transplantation in Punjab

Suggested strategy	Implementing Agency
1. Extension Strategy	
Frequent village level group meetings in the early rice growing areas	S.D.A.
Extensive use of mass media highliting not to grow rice early	P.A.U. and SDA
Training of farmers	P.A.U. and SDA
Training of Extension personnel	P.A.U. and SDA
Organization of social groups to exert social pressure not to grow rice early	S.D.A.
The rice transplanters be popularized	S.D.A.
II. Technological strategy	
High yielding short duration varieties of rice be developed	P.A.U.
Rice varieties that need less water be developed	P.A.U.
Insect and disease resistant varieties be developed	P.A.U.
Paddy transplanters acceptable to farmers should be designed	P.A.U. and S.D.A.
III. Strategies based on legislation and policy measures	
Govt. should pass legislation not to transplant rice before 10th June	P.L.A.
Regular supplyof electricity should be ensured from 10th June in rice growing areas	P.S.E.B.
Canal water should be made available from 10th June in sufficient quantityin the rice growing areas	P.S.I.D.
Purchase of rice by sheller owners and by Govt. should be started from 1st of October	P.S.M.B.
Seed sale of rice should not be allowed before 1st of May	P.A.U., PUNSEED, NSC
Repair of river 'bunds' to minimize losses of paddy during monsoons	P.S.I.D.

Training of farmers

Once the extension personnel are trained in the selected areas, they are supposed to train the farmers in all these areas. They should extensively make use of video films specially prepared for the purpose of checking early rice transplantation, the demonstration regarding the working of paddy transplanters in the farmers' fields should be conducted by the extension workers and farmers need to be guided in the area of nursery raising.

Organization of groups in the villages

Social groups (intellectuals, politicians, traditional leaders, etc.) in the villages should be identified and organized. These groups should be properly educated regarding the demerits of early sowing and sustainability of agriculture in Punjab, keeping in view the decreasing water levels year after year. Such groups should be used for exerting social pressure on farmers for sowing rice timely.

Technological strategy

Development of high yielding short duration varieties

Efforts should be made by the scientists of P.A.U. to develop short duration high yielding varieties which can help the farmers to sow the succeeding crop in time. The scientists of P.A.U. should test and recommended the varieties which can survive for some days under the water-logged conditions, so that the farmers in the flood prone areas may adopt these varieties during the recommended dates of transplantation. International Rice Research Institute (IRRI), Phillipines have already developed some varieties which can flourish under the submerged conditions without sacrificing yield (Khus, 1996) which can be tried on the farmers' fields.

Insect and disease resistant varieties of rice

The varieties of rice namely PR 111 and PR 110 released by PAU and which are resistant to the predominant bacterial blight pathogen need to be tested at farmers' fields. However, the variety having resistance to both insects (particularly stem-borers) and disease (bacterial blight) need to be evolved so that the farmers can save a lot of money spent on pesticides.

Concerted efforts should be made by the scientists to explore/develop the variety that needs less water. In view of the receding water table in the state, water is going to become a limiting factor for increased production of rice in the coming decades.

Designing of paddy transplanter

Since availability of labour at cheaper rates during the month of May has been one of the main reasons for early transplantation of rice, hence to overcome this problem a 6-row manually operated paddy transplanter using 'Mat' type of seedlings developed at P.A.U. should be tested as the scientists perceived that its use can save 60 per cent labour and 40 per cent money over manual transplanting of rice. The extension functionaries of the State Department of Agriculture should demonstrate its use on the farmers' fields and feed back of the results or the reasons (if any), for its non-adoption by the farmers of Punjab, to the scientists of PAU so that it may be redesigned/modified as per the needs of the farmers.

(c) Strategy based on legislation and policy measures

The Punjab Government should pass a legislation in the Legislative Assembly that no farmer would transplant rice before 10th June in future.

Ensuring regular supply of electricity from 10th June onwards

The policy of the Punjab State Electricity Board (PSEB) need to be revised so that more supply of electricity may be provided to the industrial sector till May and thereafter uninterrupted supply of electricity be provided to the agricultural sector from the second week of June till the onset of Monsoons. In this way, the major reason leading to early rice transplantation can be rightly tackled.

Canal water availability

The Punjab State Irrigation Department (PSID) should take adequate steps to ensure that canal water in sufficient quantity is made available in the rice growing areas from 10th June onwards.

Postponing seed sale of rice

It has been observed that the rice growers usually purchase fresh seed from the registered seed agencies like PAU, PUNSEED and NSC. One of the steps for checking early rice transplantation would be that the sale of seed of rice from the registered seed agencies should be postponed till the end of April every year.

Repair of river bunds

The Punjab State Drainage Department should take appropriate measures for repairing the river bunds in the low lying areas (Kapurthala District) so that the losses of rice due to floods can be minimized.

Procurement of rice by the Government and the sheller owners

Purchase of rice by sheller owners by the Government should be started every year from the 1st of October onwards. Punjab State Marketing Board (PSMB) should direct the sheller owners not to purchase rice before 1st October so that marketing of early sown rice produce can be discouraged.

CONCLUSION

It has been concluded from the study that in order to check the declining water table in Punjab due to early transplantation of rice, a holistic approach based on Extension, Technology, Legislation and Policy measures should be followed. Concerted efforts should be made to create awareness among the farmers about the timely sown rice crop through mass media like Radio, T.V., Video clips, demonstrations, village meetings, trainings, besides developing short duration high yielding, less water requiring and insect pest and disease resistant varieties of rice. The Government should discourage early procurement of rice from the farmers.

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Correlates of Adoption of Weather Forecasts by Farmers

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ABSTRACT

Weather is the critical factor and essential for the success of agricultural enterprises. Weather forecasts need to be specific to agriculture and locations for enhancing their applicability. The purpose of this article is to ascertain extent of adoption of weather forecasts by farmers and its associated relationship with different demographic and psycho-social variables. The study was carried out in Ananthapur, Rangareddy and Visakhapatnam districts of Andhra Pradesh with a sample of 180 farmer respondents. Majority of the farmers possessed medium followed by low and high levels of adoption of agricultural weather forecasts respectively. The variables viz., farm size, knowledge of weather, innovativeness, scientific orientaion, economic motivation, attitude, value orientation and risk orientation of the farmers showed positively significant association with extent of adoption of weather forecasts. Regression analysis showed that education, farm size, knowledge of weather, attitude and value orientation contributed positively and significantly towards extent of adoption of weather forecasts by farmers. Results are discussed in terms of their implications for enhanced adoption of weather forecasts and technology transfer activities to farmers.

The objective of providing weather forecasts is to disseminate information to the farmers on farm operations in time so that they can utilize the beneficial aspects of weather information to increase crop production and/or minimize the crop damage (Rao, 2003). Better understanding of weather and its variability on the overall effect of the different processes contributing to agricultural production is necessary to adopt appropriate cropping system as well as soil and water management practices. Weather forecasting is essential especially when farm management strategies provide mitigation techniques to crops/livestock. Forecasts were more likely to be adopted and to be useful science, if the values, perceptions and preferences of potential users became an integral part of the forecast process (Letson *et al.*, 2000). Extent of adoption in the present study refers to the degree to which farmers adopt the recommended practices in weather forecasting in relation to agriculture and allied activities. Psycho-social environment evolves from social and interpersonal relations between organizational actors and, is a result of formal and informal interactions among employees and between employees and management (Hammer *et al.*, 2004). Psycho-social characteristics of farmers directly influence their adoption behaviour (Somasundaram, 1995; Joy Prakash, 2000; Kumar, 2002; Latha 2002; and Sohngen *et al.*, 2003). The present study was undertaken with the specific objectives to ascertain the extent of adoption of weather forecasts by farmers and its associated relationship with different demographic and psycho-social characteristics.

METHODOLOGY

The study was carried out in Andhra Pradesh state. Ananthapur, Rangareddy and Visakhapatnam districts representing three different regions of the state were selected randomly. Of the 63, 37 and 43 mandals of Anantapur, Rangareddy and Visakhapatnam districts respectively, three mandals from each district were selected. Two villages from each mandal making a total of eighteen villages were selected. A sample of 180

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farmer respondents @ 10 from each village was selected. The samplilng procedure followed for selection of districts, villages and farmers was random. A draft interview schedule with scales, tests etc. for measuring the variables of the study was first developed and pre-tested before data collection. The psycho-social variables (independent variables) viz., age, education, farming experience, extension contact, mass media exposure, farm size, market orientation, knowledge of weather, innovativeness, scientific orientation, economic motivation, attitude towards weather forecasts, achievement orientation, value orientation, level of aspiration and risk orientation were included to analyse their influence on extent of adoption (dependent variable) of farmers. Adoption index was developed for measuring the extent of adoption of weather forecasts by farmers. The index contained 16 items with a three-point continuum. The respondents were classified into three groups of low, medium and high level of adoption based on the minimum and maximum obtained scores. Statistical procedures like frequency & percentages, mean, standard deviation, correlation and multiple linear regression were employed to analyze and interpret the data.

RESULTS AND DISCUSSION

Extent of adoption of agricultural weather forecasts

Majority (69.00%) of the farmers had medium level of adoption followed by low (19.00%) and high (12.00%) levels of adoption of agricultural weather forecasting (Table 1). Majority of the farmers adopted the recommended practices in weather forecasting for activities like sowing, fertilizer/pesticide application and harvesting only. The probabilistic nature of forecasts makes it even more difficult to adopt. Further, forecasts were more likely to be adopted if the needs preferences of farmers became an integral part of scientific methods. The finding is in line with those of Letson *et al.* (2000).

Table 1. Distribution of farmers on the basis of their adoption index

(N = 180)

S.No.	Category	Frequency	Percentage
1.	Low adoption	34	19.00
2.	Medium adoption	124	69.00
3.	High adoption	22	12.00
	Total	**180**	**100.00**

Activity-wise extent of adoption of agricultural weaher forecasts by farmers

Land preparation and sowing activities were fully adopted by majority of farmers *i.e.* 82.78 % and 69.44 % respectively since land preparation was to take advantage of early onset of rains and subsequent sowing operations (Table 2). Activities like fertilizer/pesticide application, irrigation scheduling, and crop monitoring were also fully adopted by majority of farmers in relation to weather conditions like rains received, temperature, cloudiness, relative humidity and wind speed. Harvesting activity was fully adopted by 73.33 per cent of farmers because harvesting the crop according to crop stage and prevailing dry weather is of utmost importance and majority of them were fully aware and recognized the importance of this activity. Processing and storage were also fully adopted by majority of farmes because after harvest, they expected prevalence of humid conditions and possible occurrence of rain. Based on that, they either retained the produce or transported for processing and marketing. This activity reflects the importance of value addition given to the food chain for the purpose of getting remunerative prices by the farmers.

Activities like selection of crops, cropping systems and area to be sown were partially adopted by majority of farmers, because these are such routine operations that the importance of weather conditions especialy, rain is partially attributed to these operations. This underlines the importance of other factors like credit, availability of inputs etc., in addition to factors concerned with weather. Urea top dressing and intercultural operations were partially adopted by 78.89 per cent and 71.67 per cent of farmers respectively. This shows the inadequate understanding of farmers about the operations like top dressing of urea, ridge and furrow preparation for rain water conservation. The researchers noticed less practice of ridge and furrow system in Visakhapatnam district. Farm diversification and disaster mitigation measures were partially adopted by majority of farmers because in a drought situation, many factors hindered diversification like lack of credit, awareness and resources. Only those farmers possessing livestock, sheep and goats derive alternative source of income. Farmers need to be trained in the shifts in cropping systems, alternate land use systems etc., especially under drought conditions. Trainings in disaster management like for cyclones coupled with accurate cyclone forecast warnings were required for the farmers to minimise crop losses and livestock damage. Working out relative benefits of

Table 2. Activity-wise extent of adoption of agricultural weather forecasts by farmers

(N=180)

S.No.	Practices*	Full adoption		Partial adoption		Non adoption	
		f	%	f	%	f	%
1.	Land preparation	149	82.78	31	17.22	-	-
2.	Selection of crops and cropping systems	20	11.11	152	84.44	8	4.45
3.	Area to be sown	41	22.78	139	77.22	-	-
4.	Sowing operations	125	69.44	45	25.00	10	5.56
5.	Fertilizer application	101	56.11	71	39.44	8	4.45
6.	Urea top dressing	35	19.44	142	78.89	3	1.67
7.	Irrigation scheduling	108	60.00	70	38.89	2	1.11
8.	Intercultural operations	45	25.00	129	71.67	6	3.33
9.	Crop monitoring	126	70.00	54	30.00	-	-
10.	Application of pesticides/fungicides	121	67.22	53	29.44	6	3.34
11.	Harvesting	132	73.33	46	25.56	2	1.11
12.	Processing and storage	128	71.11	47	26.11	5	2.78
13.	Diversification of farm	50	27.78	115	63.89	15	8.33
14.	Conservation of water	20	11.11	24	13.33	136	75.56
15.	Disaster mitigation measures	52	28.89	98	54.44	30	16.67
16.	Workingout relative benefits of forecast information	27	15.00	10	5.56	143	79.44

* Multiple responses

weather forecasts in farming was not adopted by large majority of farmers because they were more awae of the direct and immediate impacts of weather events on crops like cyclone, delayed onset of monsoon and hence they followed the same. It was also due to the qualitative nature of information led to difficulty in quantifying the benefits of weather forecasts.

Correlates of adoption

Majority of the farmers were old, without formal education, having 21-30 years of farming experience, with medium extension contact & mass media exposure, small farm holdings, high market orientation, medium knowledge of weather & innovativeness, high scientific orientation, medium economic motivation, neutral attitude towards weather forecasts, medium achievement orientation, high value orientation, medium level of aspiration and high risk orientation. Coefficient of correlation between extent of adoption and 16 selected variables was computed and compared (Table 3). Farm size, knowledge of weather, innovativeness, scientific orientation, economic motivation, attitude, value orientation and risk orientation were found to be positively significant at 0.01 level of probability. Farm size had a positive and significant relationship with extent of adoption. Farmers with large acreage usually experiment the weather forecasts on a small scale in the beginning. When the forecasts turn to be true once or twice, they adopt the recommended practices in weather forecasts on a wider scale. Whereas, farmers with small holdings can not afford to experiment or adopt the forecasts, because in the event the forecasts fail, they can not cope up with the loss. Similar observations were reported by Marimuthu

Table 3. Correlation coefficients between extent of adoption and independent variables of respondents

S.No.	Independent variables	'r' value
X_1	Age	0.026
X_2	Education	0.009
X_3	Farming experience	0.058
X_4	Extension contact	0.038
X_5	Mass media exposure	0.054
X_6	Farm size	0.413**
X_7	Market orientation	0.027
X_8	Weather kowledge	0.212**
X_9	Innovativeness	0.278**
X_{10}	Scientific orientation	0.202**
X_{11}	Economic motivation	0.201**
X_{12}	Attitude	0.263**
X_{13}	Achievement orientation	0.064
X_{14}	Value orientation	0.347**
X_{15}	Level of aspiration	0.046
X_{16}	Risk orientation	0.250**

** Significant at 0.01 probability level

* Significant at 0.05 probability level

(2001), for farmers adopting tea-growing technologies. Weather knowledge exhibited a positively significant relationship with extent of adoption. With the amount of information, understanding gained about weather forecasts, farmers were more convinced and confident to adopt them. Value orientation was found to have a positive and significant relationship with extent of adoption. Farmers think, feel and act based on the values they hold which form important components of their behaviouir. Accordingly, farmers scoring high on values like cosmopoliteness, liberalism, scientificism and aspiration tend to experiment and adopt weather forecasts. Whereas, farmers scoring low on the above dimensions, do not often experiment and reach the adoption stage.

Further, in order to determine the combined effect of all the independent variables in explaining variation in extent of adoption of the farmers, multiple linear regression analysis was carried out and the results have been presented in Table 4. Out of the sixteen independent variables fitted in the regression equation, education, farm size, knowledge of weather, attitude and value orientation were found to be contributing positively and significantly at 0.01 level of probability to the variation in extent of adoption. Education had positive and significant relationship with extent of adoption. It was quite logical that respondents with high education could discern the recommended practices in weather forecasts and further adopt the same. This finding was in conformity with those of Sohngen *et al.* (2003), who reported that more educated farmers were more likely to adopt the forecasts. Though positive, the t values of age, farming experience, extension contact, mass media exposure, market orientation, innovativeness, scientific orientation, economic motivation, achievement orientation, level of aspiration and risk orientation reflect their contribution not useful for prediction purposes.

Table 4. Regression coefficients of independent variables with extent of adoption

S. No.	Independent variables	Regression coefficient	Standard error	't' value
X_1	Age	0.336	0.355	0.947
X_2	Education	0.355	0.144	2.463**
X_3	Farming experience	0.005	0.023	0.219
X_4	Extension contact	0.080	0.185	0.430
X_5	Mass media exposure	0.081	0.185	0.430
X_6	Farm size	0.076	0.014	5.342**
X_7	Market orientation	0.009	0.201	0.043
X_8	Weather kowledge	0.249	0.099	2.523
X_9	Innovativeness	0.083	0.236	0.350
X_{10}	Scientific orientation	0.033	0.096	0.344
X_{11}	Economic motivation	0.263	0.171	1.541
X_{12}	Attitude	0.215	0.092	2.333**
X_{13}	Achievement orientation	0.241	0.495	0.486
X_{14}	Value orientation	0.309	0.105	2.946**
X_{15}	Level of aspiration	0.067	0.336	0.200
X_{16}	Risk orientation	0.054	0.122	0.441

$R^2 = 0.545$; F ratio = 7.486**

** Significant at 0.01 probability level

* Significant at 0.05 probability level

The value of coefficient of multiple determination (R^2) was 0.54, implying that all the independent variables could explain more than half of the variation in the dependent variable, *i.e.* extent of adoption to the tune of 54 per cent. The 'F' ratio showed that this variation was found to be significant at 1 per cent level of significance.

CONCLUSION

Majority of the farmers had medium followed by low and high levels of adoption of agricultural weather forecasting. The variables *viz.*, farm size, knowledge of weather, innovativeness, scientific orientation, economic motivation, attitude, value orientation and risk orientation of farmers were found to establish positive and significant association with extent of adoption. Regression analysis showed that variables *viz.* education, farm size, knowledge of weather, attitude and value orientation contributed positively and significantly towards extent of adoption by the farmers. The findings have implications for the understanding of demographic, psychos-ocial factors and their bearing on extent of adoption by farmers. From the perspective of farmers, the above factors are key ingredients for adoption. This was especially true for farmers in terms of thinking, feeling and acting towards weather forecasts based on the values they hold, possessing information regarding weather, and the degree of positive or negative feeling they harbour towards forecasts that reflects in good value orientation, knowledge of weather and attitude respectively. The relative importance of these variables reflects both internal environment and external social relations of farmers that pave way for enhanced adoption. Extension and meteorological organizations should pay attention to the above contributing factors in designing their interventions relating to adoption of weather forecasting among farmers.

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Knowledge of Field Staff and Their Constraints in Transfer of Technologies in Watershed Programmes

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ABSTRACT

Watershed development programme is the well known approach for rural development. But, field level staffs of NGO and State department are unable to utilize this approach to its maximum capacity due to some constraints. It is imperative to assess those constraints, which prevent them in transfer of technologies. It is equally important to study their knowledge level with regard to those technologies and their opinion on the most suitable extension methods for their transfer. With these objectives a research project was run at Bellary district of Karnataka. The results showed that the knowledge level of field staff ranged between 40 to 70 percent, in which state department staff bettered the NGO staff. Group meetings (91.67%) and study tours (90.28%) were considered as the most effective methods for transferring soil and water conservation technologies in watershed programmes. Irregular release of fund, insufficient staff, changes in guidelines and difficulty in convincing farmers were the predominantly quoted constraints by the majority of the field staff.

Watershed development is increasingly seen as the lynchpin of rural development in dry land areas – one that integrates sectors and provides the foundation for subsequent development (Joy *et al*, 2006). It is considered as one of the time tested approaches to the progress of rainfed areas by various government and non-government organizations. The Karnataka state government runs a separate commission for watershed development and almost all the NGOs in the state involve themselves in various projects.

The role of filed level staff of NGOs and state department is very crucial in any watershed development programme. In order to make watershed development projects participatory and sustainable, it is suggested that bottom-up planning by involving reputed local NGOs must be encouraged from the beginning of the project (Sudan, 2002). It is equally important to ensure that the knowledge base of those staff is strong enough to carry out such a quality and process-intensive programme.

In the tracts of arid and semi-arid regions, the knowledge base is not sufficient or at any rate not systematically documented in an accessible form. The extent of interaction between filed level agencies and the research system and between different NGOs active in this arena to exchange experiences, identify field level problems that need further study and get researchers to provide feedback on solutions must increase. A systematic and sustained effort to collate and update the knowledge from research stations and field experience, identify gaps needing further research, keep updated and promote closer interactions between the agencies involved is therefore essential to make watershed programmes more effective (Vaidyanathan, 2006). So, it is essential to identify the resource centres from which these staffs access their technologies and the level of their knowledge with regard to those technologies.

In spite of having a rich knowledge, gained from the research stations and field experience, there may be some constraints, which prevent these staffs in transferring those technologies. So, it is also important to identify and analyze those constraints, which are refraining them in executing their work. Being a research organization on Natural Resource Management, the Central Soil and

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Water Conservation Research and Training Institute (CSWCRTI), Dehradun, sought to find out these information. Hence, a research project was initiated by considering the issues given below to get an overall vision of the reasons behind this problem.

1. What are all the resource centres available for developing transferable technologies for the watershed development programmes in a given region?
2. What are all the technologies developed by those resource centres?
3. To what extent the functionaries working in the field are aware or known of those technologies?
4. What is the opinion of those functionaries regarding the best suited extension approaches for transferring those technologies?
5. What are all the constraints faced by them in dealing with those technologies in the watershed development projects?

This project was started in the year 2005 and simultaneously run in all the eight regional centres of CSWCRTI, Dehradun. This paper deals with the results obtained from the study conducted at the regional centre in Bellary, Karnataka, a semi-arid region of India.

METHODOLOGY

Two watersheds, namely, Upparahalla (sub watershed-IV) and Kalvi-I, Bellary, were selected for carrying out the study. The Upparahalla watershed was under KAWAD (Karnataka Watershed Development) project, governed by the NGO, MYRADA at Hosahalli from 1999-2004. The Kalvi watershed was under Desert Development Project (DDP-VI) maintained by the NGO, SNEARDS, at Hadagalli, from 2001-2005.

The possible resource centres of technologies available for developing these watersheds were identified. Subsequently, those technologies were collected and compiled into a coherent document. The technologies were categorized into different classes based on their nature such as agronomical, mechanical, and vegetative, or on the basis of their usage such as individual-oriented, group-oriented or organization-oriented. Further, the details of those technologies were shown to and scrutinized by the experts of the concerned fields, in order to bring out a logical set.

Later, a questionnaire was developed by incorporating this scrutinized logical set of technologies for the purpose of interviewing the field staff. Further, field level functionaries (staff of both the NGOs and State Government) were identified and interviewed using this questionnaire. Major focus of these interviews was to know the level of their knowledge with regard to these technologies. They were also asked to give their opinion on the most suitable approaches to transfer soil and water conservation (SWC) technologies in watersheds and the constraints faced by them in this regard.

RESULTS AND DISCUSSION

Following are the identified resource centres which were considered to have accessibility to NGOs and State Government organizations located in this region, i.e., Bellary district of Karnataka, for likely transfer of technologies to their fields.

1. Central Soil and Water Conservation Research and Training Institute (CSWCRTI), Research Centre, Bellary.
2. Central Research Institute for Dryland Agriculture (CRIDA), Hyderabad.
3. University of Agricultural Sciences (UAS), Dharwad.
4. All India Coordinated Research Project for Dryland Agriculture (AICRPDA), Bangalore.
5. Operational Research Project (ORP-Watershed), Bangalore.
6. All India Coordinated Research Project for Dryland Agriculture (AICRPDA), Bijapur.
7. Karnataka State Department Training Centre for Soil and Water Conservation (KSDTCSWC), Bijapur.

The technologies were classified as shown in the Table 1.

It is known from the Table 1, that agronomical technologies are mostly individual oriented (94%), rather than that of group or organization. The fact that agronomical measures form the basis of crop production, which was followed by the farmers from time immemorial, naturally they were of predominantly individual oriented. Whereas, majority of the mechanical measures, by the nature of high cost involved in them, could possibly be implemented by a group or an organization. So, the results depict the fact that they were mostly of group or organization oriented (58.5%). In case of vegetative technologies also, an individual can go for

Table 1. Classification of soil and water conservation technologies

Nature of Technology	Orientation of Usage				
	Individual f (%)	Individual/ Group f (%)	Group/ Organization f (%)	Individual/ Group/ Organization f (%)	Total f
Agronomical	47 (94)	1 (2)	0	2 (4)	50
Mechanical	14 (29)	0	28 (58.5)	6 (12.5)	48
Vegetative	22 (82)	0	3 (11)	2 (7)	27
				Grand total	125

it with out much need for any group action or help from any organization. So, maximum technologies (82 %) were of individual oriented.

The knowledge exposure of field level functionaries regarding the above stated technologies was assessed and presented in Table 2. In total 24 numbers of respondents were studied (10-NGO staff, 14-State department staff).

The level of knowledge of NGO staff was almost equal in all the three types of technologies i.e. agronomical (40.4 %), mechanical (43.3 %) and vegetative (42.6 %). This might be due to the reason that the NGOs had their staff equally distributed in all the above mentioned specialized areas. Though their level of knowledge was comparatively lower (less than 50 %) than the state department staff (more than 50 %), they apparently had equal level of knowledge in all the three fields.

In case of State department staff, their knowledge level was more with regard to agronomical measures (77.9 %) followed by mechanical (70.2 %) and vegetative measures (50.8 %). This shows that similar to farmers, the state department staffs also posses more knowledge with regard to agronomical measures as they are mostly of production oriented activities and their interaction with the farmers was predominantly on the issues of crops and cropping system.

Further, despite the reason that mechanical technologies were mostly of protection oriented, their knowledge was almost closer (70.2 %) to that of agronomical measures. This could be due to the reason that they might have undergone specialized training programmes on these aspects, unlike farmers.

In case of vegetative technologies, their level of knowledge was comparatively low (50.8 %). This shows that their intervention in the field with regard to vegetative measures was much low. Role of vegetation to stabilize the engineering structures was mentioned as very vital in many studies. In the new approach and technology, the ultimate aim is to establish vegetation and a series of filtering and flexible structure-gabions, loose boulder structures are installed to promote the growth of vegetation for sustainable conservation of the natural resources (Joshi, 2005). As improvement in the vegetation is one of the main concerns of any watershed development programme, this result proves that the importance given to this aspect was comparatively less.

With regard to the opinion of watershed staff on suitable extension methods (27 in numbers) for transfer of SWC technologies, analysis was carried out using effectiveness index and rank ordering method and the results are given in the Table 3 and 4.

Table 2. Knowledge level of watershed staff (NGO and State department) with regard to SWC technologies

Particulars	Agronomical Technologies (50 No.)		Mechanical Technologies (48 No.)		Vegetative Technologies (27 No.)	
	NGO	State Dept.	NGO	State Dept.	NGO	State Dept.
Technologies known by the staff (Mean)	20.2	38.9	20.8	33.7	11.5	13.7
Percentage	40.4	77.9	43.3	70.2	42.6	50.8

Table 3. Opinion of watershed staff regarding the most suitable extension methods for transfer of SWC technologies

No.	Methods	Total Score	Effectiveness Index (%)*	Rank
1.	Group Meeting	66	91.67	1
2.	Study Tour	65	90.28	2
3.	Formation of Groups (SHGs & UGs)	60	83.33	3
4.	Farm and Home visit	59	81.94	4
5.	Result demonstration	58	80.56	5

Table 4. Opinion of watershed staff regarding the least suitable extension methods for transfer of SWC technologies

No.	Methods	Total Score	Effectiveness Index (%)*	Rank
6	Farm publication	44	61.11	16
7	Campaign	44	61.11	16
8	Radio	43	59.72	17
9	Signing of MoU	43	59.72	17
10	Personal letter	42	58.33	18

$$\text{*Effectiveness Index} = \frac{\text{Total score given to a particular method} \times 100}{\text{Total number of respondents (24)} \times \text{Maximum possible score (3)}}$$

The results show that Group Meeting (91.67%) ranks first among all the extension methods suitable for transferring SWC technologies to the farmers, followed by Study tour (90.28%), Formation of groups like SHGs and UGs (83.33%), Farm and Home visit (81.94%) and Result demonstration (80.56%). These results once again proved the significance of time tested methods like group meeting and study tour in imparting awareness and knowledge to the farmers. As per the famous quote "Seeing is believing", it is ensured from the results that methods like study tour and result demonstration were considered as most suitable approaches especially for programmes of watershed development. Similarly, personal interactions are also equally important in these activities, as it is revealed that formation of SHGs and UGs and farm and home visits were considered as two of the most suitable approaches.

On the other side, methods like personal letter and farm publication were not considered by them as much suitable for transfer of SWC technologies. The reason might be the demand of literacy knowledge among the stake holders in order to exercise this method, which is still a distant dream in many parts of rural Karnataka. The transfer of information through Radio has also lost its significance, owing to the probable reason that less interest among the farmers in listening to Radio. The campaign and signing of MoU were also not considered favorable by many of the staffs. This might be due to the reason that the former one was not much suitable, by its very nature, for programmes like watershed development projects and the latter one was recently introduced in watershed programmes by few organizations like NABARD, and thus might not be known by much of the field staffs.

Further, the watershed staffs were also asked about the constraints faced by them in transfer of technologies to the farmers. The results are presented in Table 5. Following are the recommended solutions with reference to above mentioned constraints.

Table 5: Major constraints faced by watershed staff

I.	NGO
1	Irregular release of fund
2	Insufficient staff
3	Making changes in guidelines affecting the process
4	Resistance from farmers for adopting new technologies
5	Caste and political dominance related issues
6	Cost involved for implementation of certain technologies in black soil is comparatively more than the normally prescribed
II.	**State department**
1	Irregular release of fund
2	Difficulty in convincing farmers to adopt new technologies
3	Difficulty in implementation through PRIs (Panchayat Raj Institutions)
4	Insufficient staff
5	Lack of adequate training
6	Encroachment of hills and nalas by farmers

Irregular release of fund

This is a policy related issue. The rules governing the watershed management fund generally prescribes the release of fund for any given year, only after the fund allotted for the previous year got spent. As both central and state governments are involved in these programmes, there were lots of complications built up in release of fund on time. A practical and transparent system of fund management shall be considered at the higher level in order to solve this problem.

Insufficient staff

This is again a policy related issue, as the authority to appoint qualified staffs in watershed departments, where there was always much demand for field work, lies entirely in the hands of concerned state governments. At present, the staffs are being deputed from Agriculture department to watershed department. In future, if the staffs were selected exclusively for watershed department, this constraint might get resolved.

Encroachment of hills and nalas by farmers

This is also an issue concerning legal implications. So, the responsibility of solving this problem rests in the hands of state government.

Making changes in guidelines / Implementation through PRIs

The political dominance was mentioned as one of the main constraints hindering watershed development by many studies. NGO staffs suffer from improper selection of beneficiaries, lack of cooperation among fellow beneficiaries, and political intervention (Reddy *et al*, 2001). This constraint became more severe once the amendments favorable to PRIs were introduced in the latest watershed guidelines. The recent amendment in Hariyali guidelines entrusted more power to the members of PRIs like gram panchayat president and secretary. This led to some unwanted complications like caste and political dominance of ruling party members in the activities of watershed development. The concepts of establishing Watershed Committees (WCs) and Watershed Associations (WAs), comprising the local villagers, were nowadays slowly waning away especially in the state government run watersheds. The NGOs and DWDO (District Watershed Development Officer) have no much say in this matter, especially with regard to monetary and decision making rights, which are almost vested with the members of PRIs. The Parthasarathy Committee suggests restoring the key role of WCs, by positioning them as one of the committees of the gram panchayat (Shah, 2006). If this suggestion were implemented, then this problem raised by the staff might get solved in future.

Resistance from farmers / Difficulty in convincing farmers to adopt new technologies

This is a common constraint mentioned by many staff quoting the reasons like high cost involved in implementation SWC technologies, lost of space in their adoption etc. However, this constraint can be restricted to some extent by following some means as given below:

1. Arranging for more number of field visits and study tours for the farmers to the places where there are visible evidences of success stories. These trips might motivate them to go for SWC practices, though they are comparatively costlier.

2. Recommendation to adopt new technologies on a group mode by forming user groups or farmer field schools etc., would possibly reduce the burden borne by individual farmer and augment the confidence in their minds, which is normally absent when an individual adopt a new technology alone.

Cost involved for implementation

As the black soil in this region possess more clay content, naturally it poses some difficulty in implementing certain technologies like farm pond, trenches etc. So, cost involved in implementing these technologies in this region is more when compared to other regions. It is suggested to increase the prescribed cost parameters at least for these specific technologies, as the constraint is due to a natural phenomenon.

Lack of adequate training

The state department staffs are sent to their own training centres at Bijapur (for Northern Karnataka) or Mysore (for Southern Karnataka). This might result in learning of same technologies, which were taught to the staffs for long years. Rather, they should be encouraged to attend training programmes on recently developed, field tested and location specific technologies, which are adequately conducted in the research centres that are mentioned in this article. This does not mean that the state department training centres are not giving trainings on latest technologies. Instead it can be interpreted that exposure to new centres would certainly bring in some fresh approaches and methods in the thoughts and actions of the staff.

CONCLUSION

The study revealed about the accessible resource centres and their technologies for transferring to the fields in the selected watershed regions. It was also brought to notice that the watershed staffs were predominantly dependent on their own state government run resource centres rather than other national level centres. The knowledge of the staff was also found to be in the range of 40-70 percent. But this might not be taken as a factual

conclusion, as the real figures about their knowledge level with regard to implementation of those technologies could be obtained only by in depth study on the subject, which was not possible by the author due to various project oriented constraints. However, the results brought out a broad idea about the knowledge exposure of watershed staff to those technologies.

In case of opinion about the extension methods, they voted for visual oriented approaches like field visits, study tour, result demonstration and rapport building approaches like formation of groups and arranging meeting among those groups. Though these approaches are widely used in other development projects also, they could play a significant role in WSD programmes as warranted by the staff. On the other hand, approaches like farm publication and campaign could be reconsidered before recommending for transferring technologies in watershed projects, especially in this region of the country.

With regard to constraints faced by the watershed staff in transferring the technologies, some possible solutions are given in the previous section itself. As we have seen, solutions for some constraints rest purely in the hands of state government. But, many other can be solved at the field level itself or with the help of research centres located in that region. However, solutions like bringing farmer friendly amendments in the watershed guidelines are entirely rely on high level policy makers. So, it was hoped that the results obtained from this study would possibly give some clues to those policy makers for bringing out some practical oriented farmers centred decisions at the field level.

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People's Perception on Conservation and Management of Fish Germplasm Resources

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ABSTRACT

Fishing provides livelihood security to the rural people. Over the years, diversity of fishes has gone down due to various reasons. This study was conducted among 331 respondents in the vicinity of Katerniaghat wildlife sanctuary. Results clearly revealed that fishermen were aware of not only the decline of fish diversity, but also its causes and remedies. Coordination among different government departments and active involvement of fishing communities are needed for effective conservation of fish diversity and germplasm.

Over the years, increasing human influences have led to the decline of this vast and varied fish diversity. There is tremendous pressure on fishing in the available water systems in India. Certain stretches of the rivers have remained subjected to intensive exploitation with the result that remunerative capture fisheries of past years no longer exists. In addition to the fishing pressures, there are other natural and anthropogenic pressures, which have contributed to the decline in fish stocks. They are habitat destruction due to over-abstraction of water, construction of dams and barrages, siltation of water bodies, and pollution due to urban, industrial and agricultural run off. The larger impacts of fish diversity decline are much more serious and yet to be visualized, estimated and valued.

Nowadays, protected areas are considered as a potential tool for conservation of biodiversity. The practice of protecting and maintaining natural areas for their scenic beauty and for recreation and enjoyment has been in vogue, since ancient times. Protected areas, in modern sense of the concept, are just a century old phenomenon. The International Union for Conservation of Nature and Natural Resources (IUCN), which has been championing the idea of protected areas since 1959; has defined protected areas as "an area of land and / or sea especially dedicated to the protection and maintenance of biological diversity and managed through legal or other effective means" (IUCN, 1994). The IUCN, through its Commission on National Parks and Protected Areas, has defined ten categories of conservation areas of local, regional and global importance.

The acclaimed and proven contribution of the protected areas towards conservation of biodiversity notwithstanding, it is important to know how these benefits are perceived by the concerned stakeholders - the local people, who are dependent upon the biological resources. A recognition of the fact that conservation is about people as much as it is about species or ecosystems has emerged world over, particularly since the 1990's. Thus, ensuring local support for protected areas is increasingly viewed as an important element of biodiversity conservation. This support, however, can not be predicted merely on the provision of long-term benefits from protected areas, in terms of the biodiversity conservation, as the local people are more concerned with their livelihood for daily survival, than conservation, which promises greater availability of natural resources in future. Therefore, it is necessary to understand the perspective of local people living in, and, around the protected areas about the perceived benefits from the

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protected areas, particularly, with respect to the biodiversity and other related factors. An understanding of this perspective would be of great help to the planners, administrators and managers of concerned biological resources.

Keeping the above perspective in view, a study was undertaken to study the perception of local fishing communities towards conservation of fish germplasm resources in and around Katerniaghat Wildlife Sanctuary (KWS) in UP. The study was done as a part of a larger project carried out to evaluate the potential of selected wildlife protected areas for conserving aquatic biodiversity. The specific objectives of the study were: (i) to document the socio-economic profile of the fishermen residing in and around the water bodies of the Katerniaghat Wildlife Sanctuary. (ii) to document and analyse the perception of local fishing community towards the status of fish diversity and its conservation in relation to the KWS. and (iii) to suggest implications of community perception to the planning and management of fish conservation programmes in the region.

METHODOLOGY

The project team undertook two pilot visits to the study area, before starting the actual fieldwork, to gain familiarity with the study area and develop relevant data collection tools. A total of 331 respondents, comprising of member fishermen of the two fishing cooperative societies, seasonal fishermen, other villagers and local forest department officials (Table 1) were interviewed for the present study, with the help of a specially prepared interview schedule. Based on the pilot visits, eight key informants were identified. Detailed informal interactions were held with these key informants, for obtaining insights into the issues of concern. Besides, two awareness-cum-sensitization field programmes were also organized by the project team, in collaboration with local forest department officials and office bearers of the local fishing cooperative societies. In these programmes, a large number of fishing community people participated and shared their views on different aspects of fish diversity and impact of different factors, including the wildlife sanctuary, upon it. These programmes were utilized as focus groups for gaining further insights.

About the site

The selected sanctuary (KWS) in the Bahraich district is located in the Terai region of UP, close to Indo-Nepal border and is spread over an area of 40009.35 ha. in which about 12,000 ha. is covered by the water resources. Amidst the dense forests of this sanctuary, the river Gerua, which originates from Nepal, passes through the protected area up to a barrage at Girijapuri. At the Girijapuri, two canals are originating from the Gerua river and after the barrage downstream the Gerua river, is known as the Ghagra river. Besides this major river, the remaining water resources include, a beel in barrage area that gets interconnected with Gerua river and a very good network of seasonal and perennial *nalas* (channels), *tals* (ponds) and other wetlands.

Table 1. Type and number of respondents interviewed for collection of socio-economic data.

S. No.	Type of respondents	Number
1.	Local fishing cooperative society members (*Matsya jivi Sahakari Samiti Ltd., Chahalwa*)	75
2.	Local fishing cooperative society members *(Navik evam Matsya jivi Sahakari Samiti Ltd., Soorat nagar, Dist. Lakhimpur Khiri)*	60
3.	Other villagers from vicinity	130
4.	Visiting seasonal fishermen	60
5.	Forest officials	06

There are 10 villages in the heart of the sanctuary which are dominated by the Tharu community - an aboriginal tribe traditionally heavily dependent on forest for their subsistence requirements. The fishing is banned inside the sanctuary area by the state forest department. Even otherwise also, these tribal people have had no relation with the fisheries. They mostly depend upon subsistence agriculture, as well as, labour for their livelihood. However, a few villages, that are immediately outside the sanctuary, are important from the fish germplasm conservation point of view, as majority of their population is dependent upon the water bodies linked with the sanctuary area (Table 2). There are two fishing cooperative societies existing on the periphery of the sanctuary area (i) *Matsya jivi Sahakari Samiti Ltd., Chahalwa,* and (ii) *Navik evam Matsya Jivi Sahakari Samiti Ltd., Soorat Nagar.* Members of these societies belong to the villages situated inside, as well as, immediately outside the sanctuary. These societies are the main support to the local fishing communities. Over the years, these cooperative societies have been fighting for the rights of fishing communities over the fishery resources with state forest and irrigation departments. A

Table 2. Villages outside the KWS not closely linked with water bodies of the sanctuary

S. No.	Village	Human population	Dependence on / Relevance to major water bodies
1.	Manjhra	8,000	60% population of fishing community, depend upon *Majhra tal* and Sharda canal for fishing-both water bodies connected with the *Gerua / Koriala* river of the sanctuary.
2.	Chalwa (consists of 7 purwas/ hamlets)	10,000	Some villagers of this Gram Sabha are member of fishing cooperative society. They depend upon Ghagra river, which is formed after merging of rivers Gerua and Koriala at Girijapuri barrage in the sanctuaray.
3.	Hanuman garhi	500	Situated on the bank of river Ghagra close to barrage, half of the village migrated into sanctuary in last 15 years due to destruction of houses and fields by the river Ghagra. Villagers depend upon river for animal bathing, fishing and supplying boats and nets on contract to the visiting seasonal fishing communities from Bihar and other areas.
4.	Vijay nagar	650	Hamlet of Burma refugees, depend upon Sharda canal-2 for irrigation and animal bathing.

group of seasonal fishermen, particularly from the states of Bihar and West Bengal, also come and stay during September to April, each year, on the bank of river Ghagra, immediately outside the Girizapuri barrage. These fishermen hire boats and nets from the local fishermen and earn their livelihood by fishing in the river. They work under the regulations of the "Matsya Jivi Sahakari Samiti, Chahalwa".

Fish diversity within the sanctuary

Detailed biological studies in the water bodies of the sanctuary revealed the presence of 87 fish species, belonging to 40 genera of 16 families under 7 orders (Sarkar et.al., 2004). The stable populations of 20 fish species, reported to be threatened in other places, were recorded from the protected water bodies of the sanctuary, indicating a good potentiality of these water bodies in harboring threatened species. The study also revealed utilization of water bodies of the sanctuary as breeding ground by the migratory and resident fish species. During study period, new maximum length sizes for six fish species were recorded from the water bodies of KWS. Besides, for four species, total length recorded was at par to that reported in earlier references. The early life stages of 17 important species were sampled inside the sanctuary. This indicated that water bodies of the sanctuary could be a potential source for conservation, as well as, for sustaining fishery in nearby areas (Annual Reports of NBFGR 2001-02 to 2004-05).

RESULTS AND DISCUSSION

A. Socio-economic profile of the fishermen

Majority of the respondents of fishing communities, as well as, the other villagers were middle aged, illiterate or educated up to primary levels, having *kachha* house (Table 3). Major occupation of majority of the people of fishing communities was fishing followed by the small trading (*i.e.*, door to door retail selling of fishes or other household goods in nearby villages). On the other hand, major occupation of other villages interviewed, was agriculture, followed by labours and small trading (Table 3).

Perception of fish diversity and its conservation:

Status of fish germplasm resources

Perception of fishermen and other villagers was sought about the status of fish germplasm resources over last 15 years in the water bodies (*i.e.* River Ghagra, Majhra Tal, Sharda river and Sharda Canals) linked with the major water body of the KWS (*i.e.* River Gerua and Koriala). Reasons perceived by the respondents for

Table 3. Socio-economic profile of the respondents

Variable		Fishing cooperative societies members (n=135)	Other villagers (n= 130)	Visiting seasonal fishermen (n=60)
1.	**Age**			
	Young (<30 years)	24 (18)	28 (21.5)	10 (16.6)
	Middle (30-50 years)	69 (51)	71 (54.6)	30 (50.0)
	Old (>50 years)	42 (31)	31 (23.8)	20 (33.3)
2.	**Education**			
	Illiterate	67 (49.6)	53 (39.2)	42 (70.0)
	Primary	55 (40.7)	42 (32.3)	18 (30.0)
	Middle	11 (8.0)	28 (21.5)	0 (0)
	Matric	02 (1.5)	05 (3.8)	0 (0)
	Above metric	0 (0)	02 (1.5)	0 (0)
3.	**Type of House**			
	Kachha	106 (78.5)	89 (68.4)	44 (73.3)
	Pucca	09 (6.6)	14 (10.7)	0 (0)
	Mixed	0 (14.8)	27 (20.7)	16 (20.6)
4.	**Major occupation**			
	Fishing	70 (51.5)	20 (15.3)	50 (83.0)
	Agriculture	15 (11.0)	45 (34.6)	0 (0)
	Labour	15 (11.0)	30 (23.0)	0 (0)
	Small trading	25 (18.5)	30 (23.0)	10 (17.0)
	Others	10 (7.5)	05 (3.8)	0 (0)

Figures in parenthesis indicate percentage

Table 4. People's perception about status of fish germplasm resources over last 15 years in the water bodies linked with the water bodies of KWS

Perception	Fishing cooperative societies members (both) (n=135)	Other villages (n= 130)	Visiting seasonal fishermen (n=60)
About availability / catch			
Increased	10 (7.5)	11 (8.5)	0
Decreased	102 (75.5)	81 (62)	60 (100)
No change	15 (11)	19 (14.6)	0
Can't say	08 (6)	19 (14.6)	0
About diversity and size of the fishes caught			
Increased	0	0	0
Decreased	108 (80)	74 (57)	50 (83.3)
No change	17 (12.9)	27 (2.7)	5 (8.3)
Can't say	10 (7.5)	29 (22.3)	5 (8.3)

Figures in parenthesis indicate percentage

decline in fish diversity in these water bodies, were also documented, along with the measures suggested by the people for conservation of fish germplasm resources in the concerned water bodies. An effort was also made to seek people's opinion about developing aquatic sanctuaries in the water bodies, like the protected forest areas.

An overwhelming majority of the respondents felt that availability of the fishes in the water bodies immediately outside, but linked, to the sanctuary, have decreased drastically during last 15 years (Table 4). They also reported that diversity of fishes caught and their average size have also decreased. Some of the important commercial fish species, like Catla, Rohu and Mrigala, are rarely caught now. The fishermen were at pain to express the difficulties they are facing in earning and sustaining a livelihood from fishing. Infact, interactions with the key informants brought out that several families from traditional fishing community have left fishing in search of an adequate livelihood in other sectors, like daily wage labourer and migration to cities, for employment. The number of visiting seasonal fishermen has also declined, over the years, due to declining fish catches. This is not a different situation from several other natural freshwater fishing habitats. What makes the situation different here, however, is the fact that, as mentioned earlier, in our biological study of fish diversity in the river Gerua (inside the wildlife protected area) which is directly linked with these water bodies, where these fishermen are fishing, a rich diversity, abundance, richness and good sizes of fishes were recorded. However, this was not the case, as far as the fishermen catches are concerned. Majority of the fishermen reported (and this was physically observed at the landing sites by the project team) that what they get in their catches are small sized fishes, (that too, in very less quantity) which fetch very low price in the market.

Reasons for decline in fish diversity

Major causes of this decline in fish diversity perceived by the fishermen are presented in Table 5. The people reported that opening of the barrage and release of the water into the Ghagra river and the two canals linked to it, is regulated by the irrigation department. The department regulates the water as per the requirements of the irrigation. The water is released from the barrage without any consideration for the requirements of fishes. Therefore, for most of the time, there is very little water for fishes immediately downstream the barrage. When the barrage is opened, the fishes get washed away in the huge flow of water. People also reported a lack of cooperation among different government departments namely, the state forest department, irrigation department and fisheries department. This was clearly evident there. The water bodies were under control of the forest department (within the protected forest territory where fishing is banned) and the irrigation department (outside the protected territory where fishing rights are given to cooperative societies and contractors by the district revenue administration). Obviously, none of the two departments is concerned about either the fish diversity or the dwindling fish catches and consequent socio-economic drudgery of the fishing communities. This is why people also perceived lack of fishery enhancement measures by the government.

The respondent also reported use of fine mesh sized nets by poachers and use of insecticides by the outside people. It was revealed by the fishermen during informal interactions that sometimes, people from outside the jurisdiction of the water area of local fishing cooperative societies, led by a few socio-economically powerful local contractors, illegally enter their water area and catch fishes by using the two destructive fishing methods. This causes huge losses both to the local fishermen, as well as, fish fauna of the water bodies. Pollution of water caused by a local sugar mill was also perceived as a cause for decline in fish diversity by the respondents. They reported that the water from this sugar mill flows into the Ghagra river through a small connecting *nala* (narrow channel) and pollutes the river water. Several fishermen also voiced this concern, during our sensitization programme.

Measures suggested by the people for fish conservation

The people suggested a few measures, which, in their view, could be taken for conservation of fishery resources in the water bodies studied (Table 6). An overwhelming majority of the respondent opined that the government department should undertake fishery enhancement measures in the Ghagra river. People, particularly the fishermen, were of the view that poor fishermen, who are finding it hard to earn a livelihood by fishing, cannot do much on our own for conservation of fishery resources. The fishermen emphasized that the water bodies located outside the protected forest area, should be regularly given on lease to the local fishing cooperative societies. It would be pertinent to mention here that at the time of this study, only one local cooperative society had fishing rights, in its jurisdiction, on lease in the river Ghagra. The other society only had

Table 5. Perceived reasons for decline of fish germplasm resources in the water bodies linked with the water bodies of KWS

	Perceived reason of decline	Fishing cooperative societies members (both) (n=135)	Other villagers (n= 130)	Visiting seasonal fishermen (n=60)
1.	Siltation of the Ghagra river, lack of water in the river/ loss of habitat	91 (67.4) *	105 (80.7)	60 (100)
2.	Incompatibility of the barrage closure/ opening with the requirements of the fishes	86 (60)	49 (37.6)	52 (86.6)
3.	Lack of cooperation among different Govt. depts.	66 (48.8)	42 (32.3)	22 (36.6)
4.	Use of small mesh sized net by poachers	74 (55.5)	51 (39.2)	34 (56.6)
5.	Use of insecticides by outside people	61 (45)	44 (33.8)	42 (70)
6.	Lack of fishery enhancement measures by the Govt.	59 (43.7)	42 (32.3)	43 (71.6)
7.	Water pollution caused by the local sugar mill	68 (50.3)	22 (17)	12 (20)

Figures in parenthesis indicate percentage

* Total percentage exceeds100 as a respondents could tell more than one reason.

Table 6. Measures suggested by people for conservation of fish germplasm resources in the water bodies linked with the water bodies of KWS

	Suggested conservation measures	Fishing cooperative societies members (both) (n=135)	Other villagers (n= 130)	Visiting seasonal fishermen (n=60)
1.	Closure/opening of the barrage to be synchronized with the requirements of the fishes	82 (60.7) *	51 (39.2)	60 (100)
2.	Fishery enhancement measures, particularly the Ghagra River by the Govt. Depts.	105 (77.7)	65 (50)	48 (80)
3.	Regular lease of the water bodies outside the protected area, to the fishing cooperative societies	112 (83)	41 (31.5)	31 (51.6)
4.	Cooperation of Govt. Depts. like Forest and police, to the fishing cooperative societies to stop poisoning, use of small mesh sized nets and illegal poaching of fishes by outside people.	98 (72.5)	49 (37.6)	41 (68.3)
5.	Control measures by the concerned Govt. Depts. to stop water pollution by the local sugar mills	89 (66)	21 (16)	19 (31.6)

Figures in parenthesis indicate percentage

* Total of percentage exceeds 100 as a respondents could tell more than one measure.

a few small ponds on lease from its concerned Gram Sabha – Majhera. The office bearers and member of the Majhera cooperative society mentioned that their society has been given half of a large water body namely, Majhera *Taal*. This *taal* is not protected but it is connected with the river Gerua, which is protected by the forest department. They informed that even demarcation of the water area to be used by the society for fishing and to be protected by the forest department, was conducted by the district revenue administration. But still, the local forest officials do not allow us to do fishing in entire water area allotted to us. The viewpoint of the forest officials was that, if we do not keep a strict vigil, these people enter into the protected area and indulge in poaching.

The people opined that closure and opening of the barrage should be synchronized with the requirements of the fishes. They also sought cooperation of the government departments, particularly, the forest and police departments, with the fishing cooperative societies, to stop poisoning, use of small mesh sized nets and illegal poaching of fishes by the outside people. Finally, the people wanted control measures to be undertaken by the government departments to stop water pollution by the local sugar mills.

Opinion about aquatic sanctuaries

An attempt was made to document opinion of the people about development of aquatic sanctuaries, as a protected area, for enhancing fish germplasm resources in nearby water areas. In this connection, the concept of the aquatic sanctuary was first explained to the respondents and then their opinion was sought on two dimensions: (a) utility and (b) feasibility of developing and sustaining aquatic sanctuaries. To elicit their views, an open-ended question was asked to the respondents. The data revealed (Table 7) that majority of the respondents perceived that aquatic sanctuaries as useful. Once the concept was explained to them, majority of them were able to foresee the benefits that aquatic sanctuaries could provide to them in the form of enhanced and sustainable fish harvests. However, half of the fishermen said that it would not be feasible to establish aquatic sanctuaries effectively as protected areas for fishes. Their major concerns were, as revealed in informal interactions, and in sensitization programmes, regarding the practical problems in implementing the concept in the field. The people were, particularly, skeptical about the efficacy, as well as, intentions of the government officials. They said, if government officials are given the authority to guard such sanctuaries, it will not be effective as; this will lead to corruption and injustice to the poor fishermen. They opined that officials will selectively allow the fishes to be smuggled out of the aquatic sanctuaries by their known powerful / elite contractors, as has happened in case of forest protected areas. The people were also apprehensive that it may turn out another instrument for oppression of the poor fishermen in the hands of the government officials in the name of protecting the fishes. The officials of forest and fisheries departments were of the view that, though the concept is good but, in practice, it would be very difficult to guard such sanctuaries from poaching fishermen. A few of the others villagers also echoed similar concerns.

Table 7. Opinion about aquatic sanctuaries in protected forest areas

Options	Fishing cooperative societies member (n= 130)	Other villagers (n=135)	Visiting seasonal fishermen (n=60)
Utility			
• Useful	89 (66.0)	70 (53.8)	32 (53.3)
• Not useful	32 (23.7)	29 (22.3)	20 (33.3)
• Don't Know/Cant say	14 (10.3)	21 (16.0)	08 (13.3)
Feasibility			
Feasible	45 (33.3)	53 (40.7)	13 (21.6)
Not feasible	69 (51.0)	52 (40.0)	37 (61.6)
Don't know / Cant say	21 (15.6)	25 (19.2)	10 (16.6)

Figures in parenthesis indicate percentage.

CONCLUSIONS

A paradoxical situation exists in the studied area - the benefits of the protection, which the fishes get in the protected waters, are not realized by the local fishermen who are located immediately outside the protected area. The rich diversity and abundance of fishes found in the protected part of the river, though, might be having positive contribution to the fish harvests downstream, however, the fishermen directly linked to the protected water did not benefit. Instead, they find themselves in troubled waters, occasionally, on charges of poaching in the protected waters, which might be true also at times, given the fact that their basic livelihood depends upon these fishery resources. However, the point to be emphasized is that water areas planning of freshwater protected water areas, particularly in the rivers, in the form of aquatic sanctuaries, will require careful consideration of its impact upon the livelihood and

welfare of the fishermen, both immediately on the periphery, as well as, further downstream. In fact, more objective impact assessments would be required in this regard.

Lack of faith in each other is clearly visible between the government departments and the fishing community people. Rather, there was an attitude of antagonism towards each other. The government officials did not see people as the custodians of natural (fisheries) resources. The people are seen as poachers only by the government officials. Fishery resources are a means of survival and earning a livelihood for poor fishermen, as most of them are with no major belongings, but government officials seemed to be only concerned with doing their duty. Therefore, some confidence building measures between the concerned government departments and the fishing communities and their organizations (fishing cooperative societies) are necessary for more effective, efficient and socially acceptable management of fishery resources in the water bodies located in, and around, the protected areas.

The opinion expressed by the fishermen and other villagers indicate that they are aware of, not only the decline of fish diversity, but also its causes, as well as, a few of the remedies. However, they are too occupied with earning a basic minimum livelihood amidst the declining fish catches, to undertake any resource enhancement or conservation measures. Therefore, it would be too naïve, to endorse the commonly held perception that the fishermen are only concerned with maximum exploitation of the resources and, they do not bother for the maintenance of the natural resources. However, these poor fishermen do not feel themselves capable enough to undertake conservation measures. Therefore, what is needed is the commitment and planned initiatives from the government departments for fishery resource enhancement in the riverine habitats with serious concern and commitment to the capacity building and active involvement of fishing communities.

Another important issue, surfaced in this study, is a well-known problem of the lack of coordination among different government departments. In fact, here the problem is very general and basic in nature. The fishes occur in the natural water, however, the state fisheries department has no authority as far as river and canals are concerned. Therefore, the fish, instead of seen as a vital natural resource and biodiversity, to be cared and nurtured, remains a commodity and a source of revenue generation to the Irrigation and Revenue departments. This is a known major issue of relevance to the policy makers. Coordinated policies and actions by different concerned government departments, along with the participation of fishermen, in the form of their grassroots level institutions i.e., fishing cooperative societies or self-help groups, could be undertaken to sustainably manage and enhance fishery resources and conserve fish diversity, in the flowing fresh waters like rivers and canals.

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Perception of Agricultural Scientists About Prevailing and Desired Organizational Climate

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ABSTRACT

The present study was conducted among 100 agricultural scientists of College of Agriculture, PAU, Ludhiana. Organizational climate scale was developed by using Likert technique in the areas of communication, managing rewards, interpersonal relationships supervision and decision making. For measuring organizational climate, different items were prepared in each of the area. Organizational climate was measured in terms of scores obtained by the agricultural scientists on organizational climate scale. The responses were recorded on a five point continuum. Based on the scores, the scientists were classified into three categories viz., average, below average and above average. Mean score of prevailing and desired organizational climate for each area was worked out. Paired t test was used to test the significance of difference in the mean scores. Significant value of 't' indicated a gap between the prevailing and desired organizational climate. There was an urgent need to improve the organizational climate.

The first agricultural university was established at Pantnagar in Uttaranchal in 1960 on the recommendations of University Education Commission and other expert committees. Following the example of university of Pantnagar, the Govt. of Punjab established Punjab Agricultural University at Ludhiana in July, 1962. Punjab Agricultural University has the statewide responsibility for teaching, research and extension in agriculture. Organizational climate serves as a guideline for dealing with scientists and has a major influence on their motivation and productivity. Scientists are engaged in transactions for meeting their professional needs and strengthening their respective disciplines. If congenial work environment prevails, only then the scientists become satisfied with their job, work in harmony as a team and motivate the people to participate in extension and developmental programmes. More favourable the organizational climate, greater will be the productivity. The present study was conducted to assess the prevailing and desired organizational climate as perceived by the agricultural scientists of Punjab Agricultural University, Ludhiana.

METHODOLOGY

A list of the in-position faculty of College of Agriculture, PAU, Ludhiana was prepared. From this list, one hundred agricultural scientists were selected in proportion to the number of scientists engaged in teaching, research and extension. Further, the scientists from professors, associate professors, assistant professors were selected in proportion to each cadre. Organizational climate scale was developed by using Likert technique. Organizational climate was measured in the areas of communication, managing rewards, interpersonal relationships, supervision and decision making. Different items were prepared in each of the area. The response for prevailing climate was recorded on a five point continuum viz. strongly agree, agree, undecided, disagree and strongly disagree with weightage of 5, 4, 3, 2 and 1, respectively for positive statements and 1,2, 3, 4 and 5 for negative statements. The response categories for desired climate were strongly desirable, desirable, neutral, undesirable and strongly undesirable. The organizational climate was measured in terms of scores obtained by the agricultural scientists on organizational climate scale.

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Mean score of the prevailing and the desired organizational climate was worked out. Paired t-test was used to test the significance of difference in the mean scores of prevailing and desired organizational climate.

RESULTS AND DISCUSSION

Perceived prevailing and desired organizational climate in the area of communication

The data pertaining to the perceived organizational climate in the area of communication had been given in Table 1. The data showed that 69 per cent of the scientists agreed to the item 'instructions are issued after due consideration by the authorities and are expected to be carried out' and 61 per cent of the scientists perceived it as a strongly desirable climate. Majority of the scientists agreed to the items 'seniors and subordinates feel free to discuss, faculty members speak with each other rather than writing memo and discussion held at various meetings are free and frank' were also perceived as desirable climate. On the other hand for the item 'information passed from one person to another is distorted', was disagreed by more than half of the scientists and 45 per cent of them perceived it as undesirable.

Perceived prevailing and desired organizational climate in the area of managing rewards

The data with regard to perceived prevailing and desired organizational climate in the area of managing rewards had been presented in Table 2. It is clear from the table that 55 per cent of the scientists disagreed to the item that 'knowledge and expertise have no value' and same percentage of the scientists perceived it strongly undesirable. Majority of the scientists agreed with the items that promotion decisions are based on the suitability of the 'promotee and accomplishment of work is appreciated' was perceived as strongly desirable. Item 'hard work is seldom recognized and appreciated' was disagreed by 46 per cent of the scientists and perceived as undesirable by more than 75 per cent of the scientists. Forty per cent of the scientists disagreed to the item that 'rewards are given strictly on the basis of merit' and perceived it as strongly desirable by 63 per cent of the scientists.

Perceived prevailing and desired organizational climate in the area of interpersonal relationships

A perusal of the data reported in Table 3 revealed that majority of the scientists agreed to the item 'work

Table 1. Distribution of the scientists of PAU according to their perceived prevailing and desired organizational climate in the area of communication (N=100)

S. No.	Items concerning area of communication	Prevailing climate					Desired climate				
		SA f	A f	U f	DA f	SDA f	SD f	D f	N f	UD f	SUD f
1.	Instructions are issued after due consideration by the authorities and are expected to be carried out	17 (17.00)	69 (69.00)	3 (3.00)	7 (7.00)	4 (4.00)	61 (61.00)	39 (39.00)	-	-	-
2.	For taking an important decision, the tendency is to pass the file to somebody else for making the decision	12 (12.00)	39 (39.00)	13 (13.00)	24 (24.00)	12 (12.00)	9 (9.00)	15 (15.00)	-	40 (40.00)	36 (36.00)
3.	The information passed from one person to another is distorted or deliberately misinterpreted	9 (9.00)	22 (22.00)	13 (13.00)	51 (51.00)	5 (5.00)	4 (4.00)	11 (11.00)	-	45 (45.00)	40 (40.00)
4.	Seniors and subordinates feel free to discuss and communicate on all issues without any reservation or hesitation	15 (15.00)	47 (47.00)	11 (11.00)	25 (25.00)	2 (2.00)	58 (58.00)	38 (38.00)	-	4 (4.00)	-
5.	Faculty members speak with each other rather than writing memo	20 (20.00)	63 (63.00)	7 (7.00)	8 (8.00)	2 (2.00)	50 (50.00)	50 (50.00)	-	-	-
6.	Discussion held at various meetings are free and frank.	18 (18.000	54 (54.00)	10 (10.00)	18 (18.00)	-	54 (54.00)	46 (46.00)	-	-	-

Figures in parentheses indicate percentage

SA-Strongly Agree, A-Agree, U-Undecided, DA-Disagree, SDA-Strongly Disagree, SD-Strongly Desirable, D-Desirable, N-Neutral, UD-Undesirable, SUD-Strongly Undesirable

Table 2. Distribution of the scientists of PAU according to their perceived prevailing and desired organizational climate in the area of managing rewards (N=100)

S. No.	Items concerning area of managing rewards	Prevailing climate					Desired climate				
		SA f	A f	U f	DA f	SDA f	SD f	D f	N f	UD f	SUD f
1.	Knowledge and expertise have no value	6 (6.00)	22 (22.00)	10 (10.00)	55 (55.00)	7 (7.00)	6 (6.00)	6 (6.00)	-	33 (33.00)	55 (55.00)
2.	Rewards are given to those who help their colleagues to develop	3 (3.00)	32 (32.00)	26 (26.00)	33 (33.00)	6 (6.00)	35 (35.00)	40 (40.00)	-	15 (15.00)	10 (10.00)
3.	Hard work is seldom recognized and appreciated	13 (13.00)	28 (28.00)	6 (6.00)	46 (46.00)	7 (7.00)	11 (11.00)	13 (13.00)	-	36 (36.00)	40 (40.00)
4.	Rewards are given strictly on the basis of merit	6 (6.00)	32 (32.00)	20 (20.00)	40 (40.00)	2 (2.00)	63 (63.00)	26 (26.00)	-	7 (7.00)	4 (4.00)
5.	Promotion decisions are based on the suitability of the promotee rather than on favouritism	12 (12.00)	43 (43.00)	18 (18.00)	24 (24.00)	3 (3.00)	55 (55.00)	45 (45.00)	-	-	-
6.	Accomplishment of work is appreciated and recorded	8 (8.00)	61 (61.00)	10 (10.00)	18 (18.00)	3 (3.00)	62 (632.00)	38 (38.00)	-	-	-

Figures in parentheses indicate percentage
SA-Strongly Agree, A-Agree, U-Undecided, DA-Disagree, SDA0-Strongly Disagree, SD-Strongly Desirable, D-Desirable, N-Neutral, UD-Undesirable, SUD-Strongly Undesirable

Table 3. Distribution of the scientists of PAU according to their perceived prevailing and desired organizational climate in the area of interpersonal relationships (N=100)

S. No.	Items concerning area of inhterpersonal relationships	Prevailing climate					Desired climate				
		SA f	A f	U f	DA f	SDA f	SD f	D f	N f	UD f	SUD f
1.	Work atmosphere is very friendly	13 (13.00)	58 (58.00)	9 (9.00)	17 (17.00)	3 (3.00)	61 (61.00)	37 (37.00)	-	2 (2.00)	-
2.	Faculty members have strong association mostly with their seniors and look for suggestions and guidance from them.	7 (7.00)	69 (69.00)	9 (9.00)	15 (15.00)	-	56 (56.00)	42 (42.00)	-	2 (2.00)	-
3.	Staff members do not trust each other	-	20 (20.00)	14 (14.00)	52 (52.00)	14 (14.00)	7 (7.00)	7 (7.00)	-	36 (36.00)	50 (50.00)
4.	Psychological climate is very conducive for developing and acquiring new knowledge	15 (15.00)	49 (49.00)	10 (10.00)	24 (24.00)	2 (2.00)	58 (58.00)	37 (37.00)	-	5 (5.00)	-
5.	Staff members deal more with differences on issues and tasks rather than engaging in personality clashes	5 (5.00)	47 (47.00)	19 (19.00)	26 (26.00)	3 (3.00)	40 (40.00)	42 (42.00)	-	6 (6.00)	12 (12.00)
6.	Working as a group is problem	4 (4.00)	33 (33.00)	5 (5.00)	44 (44.00)	14 (14.00)	9 (9.00)	12 (12.00)	-	32 (32.00)	47 (47.00)

Figures in parentheses indicate percentage
SA-Strongly Agree, A-Agree, U-Undecided, DA-Disagree, SDA0-Strongly Disagree, SD-Strongly Desirable, D-Desirable, N-Neutral, UD-Undesirable, SUD-Strongly Undesirable

atmosphere is friendly and faculty members have strong association with their seniors' and was perceived as strongly desirable climate. On the other hand 52 per cent of the scientists disagreed to the item that 'staff members do not trust each other' and 50 per cent perceived it as strongly undesirable climate. The item 'working in a group is problem' was disagreed by 44 per cent of the scientists and 47 per cent of them perceived it as strongly undesirable climate. Forty nine per cent of the scientists agreed to the item that 'psychological climate is very conducive' and perceived it as strongly desirable by 58 per cent of the scientists. Item 'staff members deal more with differences on issues and tasks' is agreed by 47 per cent of the scientists and 82 per cent of the scientists perceived it as desirable.

Perceived prevailing and desired organizational climate in the area of supervision

Perception of scientists' with regard to prevailing and desired organizational climate in the area of supervision was presented in Table 4. Senior faculty members take pains to see that junior faculty improve skills, seniors are free to express their feelings, senior faculty members ask juniors for new ideas and higher authorities make efforts to identify and utilize the potential of the staff members were the items to which majority of the scientists agreed and perceived as desired climate also. Forty one per cent of the scientists disagreed to the item that 'supervision is done usually to find mistakes' and it was perceived as undesirable climate by 86 per cent of the scientists. More than 60 per cent of the scientists disagreed to the item that 'every staff member do not know who is working under whom' and was perceived strongly undesirable by 43 per cent of the scientists.

Perceived prevailing and desired organizational climate in the area of decision making

The data on the perceived prevailing and desired organizational climate in the area of decision making had been presented in Table 5. The figures in the table revealed that 63 per cent of the scientists agreed to the item that 'decisions are made and influenced by specialists and knowledgeable persons' and perceived it as a desirable climate. Decisions are made keeping in view the welfare of the faculty, faculty have influence in decision making and decisions are taken after discussion with the concerned people were the items on which majority of the scientists agreed and perceived them as strongly desirable climate.

Table 4. Distribution of the scientists of PAU according to their perceived prevailing and desired organizational climate in the area of supervision (N=100)

S. No.	Items concerning area of supervision	Prevailing climate					Desired climate				
		SA	A	U	DA	SDA	SD	D	N	UD	SUD
		f	f	f	f	f	f	f	f	f	f
1.	Supervision is done usually to find mistake and catch the person	9 (9.00)	38 (38.00)	12 (12.00)	41 (41.00)	-	5 (5.00)	9 (9.00)	-	43 (43.00)	43 (43.00)
2.	Senior faculty members take pains to see that junior faculty members improve skills	6 (6.00)	57 (57.00)	18 (18.00)	16 (16.00)	3 (3.00)	50 (50.00)	48 (48.00)	-	2 (2.00)	-
3.	Seniors are free to express or discuss their feelings with their juniors	10 (10.00)	62 (62.00)	12 (12.00)	16 (16.00)	-	43 (43.00)	57 (57.00)	-	-	-
4.	Senior faculty members ask juniors for new ideas	4 (4.00)	60 (60.00)	9 (9.00)	24 (24.00)	3 (3.00)	41 (41.00)	51 (51.00)	-	6 (6.00)	2 (2.00)
5.	Every staff member does not know who is working under whom	-	15 (15.00)	5 (5.00)	63 (63.00)	17 (17.00)	4 (4.00)	9 (9.00)	-	44 (44.00)	43 (43.00)
6.	Higher authorities make efforts to identify and utilize the potential of the staff members	4 (4.00)	56 (56.00)	13 (13.00)	25 (25.00)	2 (2.00)	56 (56.00)	42 (42.00)	-	2 (2.00)	-

Figures in parentheses indicate percentage
SA-Strongly Agree, A-Agree, U-Undecided, DA-Disagree, SDA0-Strongly Disagree, SD-Strongly Desirable, D-Desirable, N-Neutral, UD-Undesirable, SUD-Strongly Undesirable

Table 5. Distribution of the scientists of PAU according to their perceived prevailing and desired organizational climate in the area of decision making (N=100)

S. No.	Items concerning area of decision making	Prevailing climate					Desired climate				
		SA f	A f	U f	DA f	SDA f	SD f	D f	N f	UD f	SUD f
1.	Decisions are generaly made without involving juniors and subordinates	9 (9.00)	47 (47.00)	6 (6.00)	36 (36.00)	2 (2.00)	9 (9.00)	18 (18.00)	-	36 (36.00)	37 (37.00)
2.	Decisions are made and influenced by specialists and knowledegeable persons	6 (6.00)	63 (63.00)	10 (10.00)	19 (19.00)	2 (2.00)	44 (44.00)	47 (47.00)	-	6 (6.00)	3 (3.00)
3.	Decisions are made keeping in view the welfare of the faculty	6 (6.00)	51 (51.00)	17 (17.00)	26 (26.00)	-	50 (50.00)	46 (46.00)	-	4 (4.00)	-
4.	Decisions are taken after discussing with the people concerned	3 (3.00)	46 (46.00)	8 (8.00)	41 (41.00)	2 (2.00)	48 (48.00)	48 (48.00)	-	4 (4.00)	-
5.	Superiors ask subordinates for an informal discussion	6 (6.00)	41 (41.00)	15 (15.00)	36 (36.00)	2 (2.00)	39 (39.00)	56 (56.00)	-	5 (5.00)	-
6.	Faculty members have influence in decision making	10 (10.00)	43 (43.00)	14 (14.00)	29 (29.00)	4 (4.00)	55 (55.00)	45 (45.00)	-	-	-

Figures in parentheses indicate percentage
SA-Strongly Agree, A-Agree, U-Undecided, DA-Disagree, SDA0-Strongly Disagree, SD-Strongly Desirable, D-Desirable, N-Neutral, UD-Undesirable, SUD-Strongly Undesirable

Table 6. Distribution of the scientists of PAU according to their perceived prevailing and desired organizational climate (N=100)

S.No.	Area	Category	Prevailing climate		Desired climate		Gap	
			f	%	f	%	f	%
1.	Communication	Above average	78	78.00	100	100.00	22	22.00
		Average	6	6.00	-	-	-	-
		Below average	16	16.00	-	-	-	-
2	Managing rewards	Above average	62	62.00	98	98.00	36	36.00
		Average	7	7.00	2	2.00	5	5.00
		Below Average	31	3.00	-	-	-	-
3	Interpersonal relationships	Above average	75	75.00	99	99.00	24	24.00
		Average	6	6.00	1	1.00	5	5.00
		Below Average	19	19.00	-	-	-	-
2	Supervision	Above average	70	70.00	98	98.00	28	28.00
		Average	8	8.00	2	2.00	6	6.00
		Below Average	22	22.00	-	-	-	-
2	Decision making	Above average	56	56.00	97	97.00	41	41.00
		Average	9	9.00	3	3.00	6	6.00
		Below Average	35	35.00	-	-	-	-

Score ranges were > 18-30: Above average, 18 Average 6-<18: below average.

Area wise perceived prevailing and desired organizational climate.

Area wise perceived prevailing and desired organizational climate was also worked out. The data in this regard has been presented in Table 6 revealed that more than 70 per cent of the scientists in the area of communication and interpersonal relationships perceived the prevailing climate above average and a gap of 22 per cent and 24 per cent was found in these areas. A gap of 41 per cent was found in the prevailing and desired

Table 7. Gap between the perceived prevailing and desired organizational climate of PAU

Area	Perceived prevailing climate (mean score)	Perceived desired climate (mean score)	Gap (Mean score)	t-value
Communication	20.87	25.94	5.07	11.52**
Managing rewards	19.22	25.25	6.03	12.10**
Interpersonal relationships	20.93	25.57	4.64	11.01**
Supervision	20.76	25.90	5.19	11.54**
Decision making	19.06	25.38	6.32	13.05**
Overall organizatiional climate	100.79	128.04	27.25	15.51**

** Significant at 1 per cent level of significance

organizational climate in the area of decision making. Reddy and Maraty (2003) reported that majority of the teachers of Acharya NG Ranga Agricultural University were grouped under medium category regarding the perception of indicators of decision making and communication. Therefore, it was suggested that there need to make some improvements in the prevailing organizational climate in the area of decision making and managing rewards.

Gap between the perceived prevailing and desired organizational climate

The data regarding the gap between the perceived prevailing and desired organizational climate had been given in Table 7. Areawise mean score was worked out. Gap between the two climate mean scores was found to be 5.07 in the area of communication, 6.03 in the area of managing rewards, 4.64 in the area of supervision and 6.32 in the area of decision making. In each area t-value was found to be significant at 1 per cent level of significance. It indicated that there was significant difference in the mean scores of perceived prevailing and desired organizational climate. These findings were in line with those of Jhamtani and Singh (1987) who reported gap in the existing and the desired organizational environment dimensions.

CONCLUSION

Majority of the scientists perceived the prevailing climate above average in the areas of communication, interpersonal relationships and supervision. There was difference in the mean scores of perceived prevailing and desired organizational climate. It could be concluded that the university scientists desired for better climate than the one which was prevailing at the moment for enhanced motivation and increased productivity.

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Impact of Farmer Participatory Assessment of Integrated Pest management

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ABSTRACT

The productivity of groundnut is low due to various insect-pests and diseases. Farmers usually spray pesticides indiscriminately even when not necessary, which has led to undesirable consequences of pest resistance, pesticide residue and environmental pollution. Hence, to minimize this undesirable consequences IPM is advocated. The on-farm trials (OFT) were conducted to assess the IPM technology with that of farmers practice (FP) of insect-pest and disease control. The OFTs indicated more effective control of major insect-pests and diseases due to IPM compared to FP. The economic returns to farmers were also higher in IPM compared to FP. The adoption of different components of IPM over a period of time indicated that the technology is spreading at a slower pace. The involvement of extension agencies and agriculture departments are required to speed-up the adoption process.

The productivity of groundnut in India is low due to various biotic stresses. Discussions with farmers revealed that insect-pests like *Helicoverpa* and *Spodoptera* and diseases like early leaf spot (ELS), late leaf spot (LLS), rust, stem rot, collar rot, aflaroot, and peanut bud necrosis disease (PBND) were the major constraints in groundnut production. In groundnut, it was estimated that the avoidable yield loss due to insect-pests alone was upto 39.50 percent (Sherasiya, 1998) and diseases was upto 40 per cent (Ghewande and Nandagopal, 1998).

Farmers usually spray synthetic insecticides and fungicides to manage the insects-pests and diseases even though the damage is below economic threshold level (ETL). This indiscriminate use of pesticides has led to several environmental problems such as development of insecticide resistance in pests, pesticides residue and the destruction of beneficial insects such as parasitoids and predators. Hence, integrated pest management (IPM) is advocated to minimize undesirable effects of pesticides. IPM includes a series of steps to keep the population level of the pests and diseases below the ETL and not to over kill them (Nandagopal and Ghewande, 2004).

In general, farmers had low awareness and knowledge on the IPM of groundnut. Hence, the IPM module developed at National Research Centre for Groundnut (NRCG), Junagadh was assessed in farmers field under Technology Assessment and Refinement though Institution Village Linkage Programme (TAR-IVLP) over a period of three years from 1999 to 2002.

The present study was conducted with the objective to assess the impact of IPM in reducing the insect-pests and diseases and increasing the economics of farmers under TAR-IVLP and to know the adoption of different components of IPM by the farmers over a period of time.

METHODOLOGY

Junagadh district of Gujarat was selected for conducting the On-farm trials (OFTs) under IVLP-TAR project. Four villages namely Vadhavi, Umatwada, Nandarkhi and Zanzarda were selected by random sampling. Fifteen farmers were selected in each year making a total of 45 farmers over a period of three years. In OFTs, IPM was compared with the farmers own

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practice (FP) of insect-pest and disease control (spraying pesticides and fungicides only). Another sample of 100 non-IVLP farmer (NIVLP) were selected by proportionate random sampling based on the area from the same four villages for the second objective.

The damage due to insect-pests such as jassids, thrips, defoliators and diseases such as ELS, LLS and rust were measured on a scale of 1-10, one being the lowest incidence and 10, being 100 per cent incidence. The diseases such as collar rot, stem rot, aflaroot and PBND were estimated based on the percentage incidence.

An index was developed to assess the adoption of IPM technology, consisting of eight components. Scores of three, two and one were given to each component according to their importance in consultation with the experts from NRCG and Junagadh Agricultural University. Based on the adoption of the practice completely, partially or not at all, the scores of two, one and zero were given, respectively for each component. Thus, a farmer who had followed all the eight components completely had a score of 30, and the one who had not followed any of the components had a score of zero. The partial budgeting technique was used to assess the economic impact of IPM technology (Birthal, 2003). The important impact indicators used were yield, gross monetary returns (GMR), cost of cultivation, net returns, and benefit cost ratio (BCR).

The IPM module consisted of soil application of *Trichoderma viride* (62.5kg/ha), castor cake @ 500kg/ha for soil borne diseases, seed treatment with carbendazim (bavistin) @ 2g/kg of seeds for seed borne diseases, need based application of 2 per cent crude neem oil in teepol for insects-pests and foliar fungal diseases, installation of pheromone traps (30 days after sowing) for monitoring *Spodoptera* and *Helicoverpa* @ 10 traps/ha each, planting of pigeon pea as trap crop for every 3-4 rows of groundnut, and castor as border crop.

RESULTS AND DISCUSSION

The impact of IPM in reducing the incidence of insect-pests and diseases

The OFTs indicated that the IPM practice gave more effective control of all the diseases compared to FP (Table 1). The IPM practice resulted in higher control of insect-pests and diseases ranging from 26-56 per cent over FP. The highest disease control over FP was achieved in stem rot (56 %), which was a major disease significantly influencing the yield of groundnut in the area, followed by LLS (48 %), collar rot (43 %), ELS (40 %), PBND (39 %), rust (35 %) and aflaroot (26 %). In case of insect-pests, the highest control over FP was observed in defoliators (36 %), followed by thrips (35 %) and jassids (29 %).

Impact on the economics of farmers

Farmers achieved higher groundnut pod and yield of 2416 and 3463 kg/ha, respectively with IPM compared to their own practice (2050 kg/ha and 3114 kg/ha) due to the effective control of insect-pests and diseases (Table 2). The GMR were highest at Rs.53,66/ha with IPM compared to FP of Rs.39,83/ha. Even though the cost of cultivation was higher by 13 percent, the net returns increased by 51 per cent in IPM over FP. The partial budget analysis indicated that the added net returns in the hands of the farmers due to IPM was Rs.11,896/ha. The BCR was 3.12 due to IPM which indicated a 20 per cent increase over FP.

Adoption of different components of IPM

The extent of adoption was assessed in terms of different components of technology and reported in Table 3. It is seen that the overall adoption of IPM was 42 percent. The components which were readily adopted by

Table 1. Effect of IPM components on the control of insect-pests and diseases

Sl. No.	Insect-Pest/ diseases	Insect-pests/ disease score		% control over FP
		IPM	Farmers practice	
I.	**Insect-pests**			
1.	Jassids	1.29	2.04	29.09
2.	Thrips	1.90	3.0	35.5
3.	Defoliators	1.50	2.19	35.7
4.	Spodoptera (nos/trap/week)	27	-	-
5.	Helicoverpa (nos/trap/week)	79	-	-
II.	**Diseases**			
6.	ELS	1.92	3.29	40.84
7.	LLS	1.91	3.21	48.15
8.	Rust	2.41	4.15	34.94
9.	Collar rot (%)	6.81	13.8	43.22
10.	Stem rot (%)	7.09	15.35	56.08
11.	Aflaroot (%)	3.24	4.03	26.14
12.	PBND (%)	2.38	4.38	39.19

Table 2. Economic impact of OFTs of Integrated Pest Management in groundnut

Economic indicators	IPM	Farmers practice	% increase over FP
A. Economic analysis			
1. Yield (kg/ha)			
i. Groundnut pod	2416	2050	17.84
ii. Groundnut fodder	3463	3114	9.6
iii. Pigeon pea	1500	-	-
iv. Castor	980	-	-
2. Total returns (GMR)	53658	39826	34.73
3. Cost of cultivation	16477	15244	13.31
4. Net returns	37181	24582	51.25
B. Partial budget analysis			
5. Added returns	13832	-	-
6. Change in cost	1936	-	-
7. Added net returns	11896	-	-
8. BCR	3.12	2.61	19.54

the farmers were seed treatment, soil application of castor cake, spraying crude neem oil, and pigoen pea as intercrop. The farmers had modified the trap crop as intercrop. The farmers opined that using pigoen pea as an intercrop was beneficial economically and equally effective in controlling the insect-pests and diseases. The farmers also indicated that application of 1000kg/ha of castor cake is very costly and it can be reduced to 500 kg/ha to reduce the cost of cultivation without compromising the disease control. Hence, the technology was refined taking farmers feed back into consideration. The NIVLP farmers adopted seed treatment, spraying of neem oil, castor cake and peigon pea as intercrop. The pheromone traps were adopted by IVLP farmers only, which were supplied under the TAR-IVLP. The pheromone traps were not adopted by the NIVLP farmers because the farmers felt that the traps do not kill the pests and they were a hinderance to the intercultural operations.

The adoption percentage increased from 42 per cent to 48 per cent over a period of three years in case of IVLP farmers, whereas, it increased from 18 per cent to 25 per cent in case of NIVLP farmers. The average adoption scores were higher for IVLP farmers in all the three years compared to NIVLP farmers and the scores were gradually increasing for both IVLP and NIVLP

Table 3. Adoption of different components of IPM by IVLP and Non IVLP farmers

IPM components	IVLP (n=45)			NIVLP (n=100)		
	2003	2004	2005	2003	2004	2005
I. Soil Application						
Trichoderma viride	10 (22.2)	12 (26.7)	08 (17.8)	02 (2.0)	05 (5.0)	06 (6.0)
Castor cake	5 (11.1)	15 (33.3)	35 (78)	28 (28.0)	22 (22.0)	30 (30.0)
II. Seed treatment						
Carbendazim (Bavistin)	40 (88.9)	41 (91.1)	38 (84.4)	73 (73.0)	76 (76.0)	70 (70.0)
III. Spraying						
Crude neem oil 2 % in Teepol	20 (44.5)	25 (55.5)	22 (48.9)	16 (16.0)	21(21.0)	35 (35.0)
IV. Installation of pheromone traps						
Spodoptera	35 (77.8)	32 (71.1)	29 (64.5)	01 (1.0)	02 (2.0)	02 (2.0)
Helicoverpa	18 (40.0)	17 (37.8)	12 (26.7)	01 (1.0)	01 (1.0)	01 (1.0)
V. Trap/border crop						
Pigeon pea	12 (26.7)	17 (37.8)	23 (51.1)	16 (16.0)	20 (20.0)	29 (29.0)
Castor	(22.2)	5 (11.1)	5 (11.1)	7 (7.0)	19 (19.0)	27 (27.0)
Adoption per cent	41.7	45.5	47.81	18	24.9	25.0
Adoption score	6.5	7.1	7.1	1.9	3.3	3.6

farmers. This indicated that the technology is spreading at a slow rate to other farmers who had not participated in the project. Hence, there is need to improve the rate of adoption among NIVLP farmers through the involvement of extension agecies and State Department of Agriculture.

CONCLUSION

The OFTs have shown the potential of IPM in reducing the pests & dieseases and increasing the economies of farmers. Sowing of pigeon pea as trap crop was refined and taken up as an intercrop based on the feed back of the farmers and dose of castor cake was decreased from 1000 kg/ha to 500 kg/ha to reduce the cost of cultivation as desired by the farmers. The technology needs to be popularized and made sustainable by addressing the constraints of availability of required inputs. The adoption study showed that the components were not adopted adequately by the farmers, but slowly the technology is spreading among the NIVLP farmers. In order to speed up the adoption rate there is need to involve the Extension agencies, State Department of Agriculture and input agencies to educate the farmers and supply the required inputs on time and at affordable prices.

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Awareness of the Stakeholders about Rice Export Quality and Standards

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ABSTRACT

Rice occupies larger area of cultivated area in India and vietnam. This study was conducted in two states of India, namely, West Bengal and Punjab and two provinces such as An Giang and Vinn Long of Vietnam. Results showed that awareness of farmer about rice export qualities/standards both in India and vietnam were found to be low to medium. Training is needed for farmers, extension personal, trader and exporters in both the countries to increase the awareness about rice export quality standards.

Agriculture is the backbone of India's economy, providing direct employment to about 70 per cent of working people in the country. It forms the basis of many premier industries of India, including the textile, jute, and sugar industries. Agriculture contributes about 31 per cent to GDP and about 25 per cent of India's exports are agricultural products (www.indiamart.com, 2005). In agriculture, rice is one of the important cereal food crops of India. Rice contributes about 43 per cent of total food grain production and 46 per cent of total cereal production in the country. The Government of India has also fixed high target of export of rice from India including broken rice. It has also fixed the export price of rice quite competitive in the international market. These measures are expected to contribute in boosting the export of rice from India.

Similar to India, rice production in Vietnam plays a crucial role in the Vietnamese rural economy, with nearly 80 per cent of Vietnamese farmers cultivating rice. The geography of Vietnam is diverse, there are high mountain in the North and in the Centre, the vast highland in the Southern Central. The Mekong Delta (Cuu Long) has an area of four million ha with 16.2 million tons of rice production or half of the total rice production in Vietnam (Bui, 2000).

"Export or perish", that is the motto of India and Vietnam. Agricultural export and rice export in particular helps to improve economic development and contributes in the improvement of life condition and income of the farmers. The research issues related to rice production and export in the rice dominated countries such as India and Vietnam are a matter of concern nowadays to promote rice export.

The study attempted to evaluate the awareness level of farmers, extension personnel, traders and exporters to assess the scope of understanding about rice export quality and standards, which are the crucial issues in rice export and formulate appropriate strategy order for compliance.

METHODOLOGY

The study was carried out in two purposively identified states of West Bengal and Punjab of India and two provinces *viz.*, An Giang and Vinh Long belonging to Mekong Delta of South Vietnam. The reasons for selecting above two states and provinces included their being most important rice production and exporting states/provinces of India and Vietnam.

The respondents for the study included four categories and they formed the total sample of 173 for India and 198 for Vietnam, overall total was 371 respondents from both the countries. The respondents consisted of 100 progressive farmers, 145 extension personnel, 67 traders and 59 exporters. In case of extension personnel, a sample of 30 each for district and

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block level for India and 45 and 40 extension personnel for district and village level respectively for Vietnam were selected.

To assess the level of awareness about exporting rice quality and standards of farmers, extension personnel, traders and exporters, a comprehensive questionnaire was developed which consisted 20 questions related to rice quality and standards. These questions were developed based on the handbook/literature on rice export quality and consultation with some prominent scientists and extension personnel. To evaluate the level of awareness the total weightage was 100 score and awareness level was arranged into four categories: Poor (below 25 score), Medium (26-50 score), Fair (51-75 score) and Good (76-100 score). The statements/questions were same for all extension personnel, traders, and exporters but for the farmer they were the simple statement/questions, which were mainly based on their practices related to quality/ standards and rice export marketing awareness. The respondents were asked to respond to each statement in terms of their own degree of awareness. The total score for an individual was obtained by adding the weight of all statements. The data was collected personally on the developed questionnaires/interview schedules and analysed statistically.

RESULTS AND DISCUSSION

Profile of respondents

Profile of the farmers

Table 1 depicts the profiles of Indian and Vietnamese farmers. These are the personal and socio-economic variables, which directly or indirectly have affected the awareness about the rice export and it's marketing. The profiles are discussed step by step.

Age : In case of Indian respondents, the minimum age was 28 and the maximum was 68 and average was 47.56 years. But for Vietnamese respondents these were 24, 78 and 45.92 years, respectively. For the age groups of Indian respondents, Young group occupied 16 per cent, Middle group 42 and Old group 42 per cent. These percentages for Vietnamese respondents were 14, 54 and 32 respectively. The Indian respondents dominated in Middle and Old groups with the same percentages, while the Vietnamese respondents dominated in the Middle group.

Education : In general, the Indian respondents had higher level of education than Vietnamese respondents. The highest education in Indian respondents was M.Sc. (4%) [illegible] and High school (32 and 28 %

Table 1. Profile of the Indian and Vietnamese farmers (%)

Characteristics	Category/range	India	Vietnam
Age (Year) (min 28, max 68, mean 47.56 yrs)	Young (25-35 years)	16	14
	Middle (36-49 years)	42	54
	Old (50 & above)		
Education	Elementary	6	14
	Secondary	20	58
	High school	38	26
	Graduate	32	2
	M.Sc.	4	0
Family head	Male	100	96
	Female	0	4
Total Family members (min 3, max 68, mean 7.06 members)	3-4 members	18	44
	5-9 members	62	54
	10 and above	202	
Working members (min 1, max 6, mean 2.74 Working members)	1-2 W, members	52	34
	3-4 W, members	38	36
	5 and above	10	30
Training Received	No-training	9212	
	Training (1 course)	8	88
Social participation	Member	50	36
	Office bearer	8	8
	Non-members	42	56
Housing status	Solid houise	68	90
	Semi-solid houise	22	10
	Unsettled house	10	0

N=59 for each country (Total N=100)

respectively). The Secondary category was also relatively high at 20 per cent. The Elementary category was low with only 6 per cent.

In case of Vietnam, there were no respondents in category of M.Sc. More than half of them belonged to Secondary group (58 %), followed by High School (26 %) and Elementary group (14 %).

Family head : In case of Indian respondents, it was 100 per cent male family head, whereas it was 96 per cent male family head in case of Vietnam.

Total family members : In both India and Vietnam, more than half of respondents (62 & 54 % respectively) had 5-9 family members. Family with 3-4 members occupied 44 per cent in case of Vietnam, whereas it was 18.00 per cent for India. Indian respondents had more percentage of family above 10 members than Vietnamese respondents (20 % against 2 %).

Working members : In case of India, more than half of respondents had 1-2 working family members (52 %), followed by 3-4 members (38 %) and above 5 members (10 %). These percentages in case of Vietnamese respondent were 34, 36 and 30 per cent respectively.

Training received : Among Indian respondents, a small percentage of farmers had received training programme (only 8% got training 1 course), whereas 88 per cent of Vietnamese respondents got training in 1-4 courses.

Social participation : Most of the Indian respondents took part in social and religious organizations/association. About 50 per cent of them were members, 8 per cent were office bearers and the non-members were 42 per cent. In case of Vietnam, more than half of respondents (56 %) were non-members. 36 per cent of them were members in Village committees; Village people's council, Village co-operative, Farmer's association and Rural youth, and 8.00 per cent of them were office bearers of these organization/associations.

Housing status : With respect to or the housing status of respondents, India had highest respondents with Solid-houses (68 %). followed by Semi-solid houses (22 %). Unsettled-houses were 10 per cent. These percentages in case of Vietnam were 90, 10 and 0, respectively.

Profile of extension personnel

The profile of Indian and Vietnamese extension personnel has been presented in the Table 2.

Age : The age of selected Indian extension personnel ranged from 24 years to 55 years with the average of 39.17 years. The majority of the district extension personnel were in young age (24-35 years; 63 %) followed by middle age (36-49 years; 23 %) and the old age group (50 years & above; 13 %). The major percentage belonged to middle age group (50 %) followed by young group (37 %). The old group was low (13 %).

Gender : Most of the extension personnel at district and block level were males (100% for district level & 97% for Block level), whereas only 1 female extension

Table 2. Profile of the Indian and Vietnamese farmers (%)

Characteristics	Category/range	District		Block/village	
		India	VN	India	VN
Age (year)	Young (24-35 yrs)	63	67	37	33
(min 24, max 55,	Middle (36-49 yrs)	23	29	50	52
mean 39.17 yrs)	Old (50 & above)	13	4	13	15
Gender	Male	100	93	97	93
	Female	0	7	3	7
Education	Elementary	0	0	0	5
	Secondary	0	0	0	33
	High School	0	0	0	37
	Assistant Agril. Officer	0	73	0	25
	B.Sc.	27	27	50	0
	M.Sc.	46	0	50	0
	Ph.D.	27	0	0	0
Service Experience	Low (1-10 yrs)	73	84	46	90
	Medium (11-20 yrs)	7	9	27	10
	High (aove 20 yrs)	20	7	27	0
Income/month	(USD)	399	27	343	69
Training received	No-training	80	0	60	15
	Low (1-4 course)	20	7	40	70
	Medium (5-6 courses)	0	7	0	5
	High (7-10 courses)	0	86	0	10
Social participation	Member	67	2	50	27
	Office bearer	33	2	23	48
	Non-members	0	86	27	25

India : District Level, N=30; Block level, N=30; Vietnam : District level, N=45, Village level, N=40

personnel (3 %) was found at block level in India. This shows wide disparity and a need to increase the number of female extension personnel to keep balance in gender to attend the clients accordingly.

Education : The education levels of Indian extension personnel were found to be high as compared to Vietnamese extension personnel. All the extension personnel at both district and block levels had educational levels of B.Sc., M.Sc., and Ph.D. At district level, M.Sc. extension personnel were highest with 46 per cent, followed by the same percentages for Ph.D and B.Sc. extension personnel with 27 per cent. For the extension personnel at block level, it is drawn from Table 2 that half of them (50 %) had M.Sc. degree and another half (50 %) B.Sc. degree. There were no extension personnel with Ph.D. degree at block level.

Service experience : For service experiences of Indian extension personnel at district level, the large number of the extension personnel (73 %) belonged to low group service experience i.e., less than ten years, followed by high group of service experience (above 20 years; 20 %) and medium group of service experience was low (11-20 years; 7 %). In case of block level, most of extension personnel had low service experience (46 %). The same percentages for both medium and high group of service experiences i.e. 27 per cent were observed.

Monthly income : The data from Table 2 revealed that at both district and block levels, Indian extension personnel had very high monthly income i.e. 399 USD and 343 USD on an average respectively.

Training received: It was observed that in India, only 20 per cent of extension personnel at district level and 40 per cent extension personnel at block level received training programmes in 1 to 4 courses. This percentage was very less as compared to Vietnamese extension personnel.

In general, Indian extension personnel received very less training related to rice production and export and extension activities. The disadvantage was similar to Vietnamese extension personnel as there was the lack of emphasis and opportunities in the area of rice quality standards for export, rice export marketing, value addition and the new economic regime/WTO etc. These issues need more attention and extension personnel should be equipped adequately to help farmers to derive benefits from the new opportunity of globalization of agriculture and WTO's provisions.

Social participation: As compared to Vietnamese extension personnel, most of Indian extension personnel took part in social participation. Majority of district level extension personnel were members in social, religious organization/associations and 33 per cent of them were the office-bearers in the social participation. In case of block level, 50 per cent and 23 per cent were members and office-bearers respectively. Only 27 per cent of extension personnel at block level did not take part in social participation.

Profile of traders and exporters

The profile of traders and exporters for India and Vietnam respondents are depicted in the Table 3.

Age: The age of all the Indian traders ranged from 27 to 60 years and the average, age was 44.4 years. The majority of traders was under old age group (50 yeas & above; 42 %), followed by the middle group (36-49 years; 31 %) and young group (25-35 years; 26 %); whereas for exporters, the major group was old age with 61 per cent, followed by young age (25 %) and old age (14). In case of Vietnamese traders, the middle age was dominated with 47.00 per cent, followed by old group (28 %) and young group (25 %); whereas, for the exporters, more than half of them belonged to old group (61 %), after that was middle group (36 %) and young age group (3 %).

Gender: For the gender, the female traders were dominated in Vietnam (53 %), whereas, for India it was marginal (3 %). But in case of exporters, the percentages of male exporters were relatively similar for India and Vietnam (100 % and 94 %, respectively).

Education: Level of education was having a large disparity between traders and exporters in the two countries. In India, these percentages were dominated with high level of education and *vice versa*. In Vietnam, the population with high education were still marginal in spite of the population with popular literature were high in Vietnam. Level of education for Indian traders started with secondary but this number was small (6 %), even high school and graduate levels also had small percentages (14 % and 3 % respectively). Indian traders were mainly with high level of education: 6 per cent were M.Sc. and 11 per cent were Ph.D.

In contrast to this, Vietnamese traders were mainly with high school (47 %) and elementary level (31 per cent). Graduate level was low with 22 per cent. In case of exporters they ranked under two education levels of high school (81 %) followed by graduate (19 %). There were no traders and exporters under educational levels of M.Sc. and Ph.D.

Table 3. Profile of the Indian and Vietnamese traders and exporters

Characteristics	Category/range	India (%)		Vietnam (%)	
		Traders	Exporters	Traders	Exporters
Age (min 27/29, max 60/59 mean 44.4/42)	Young (25-35 yrs)	26	25	25	3
	Middle (36-49 yrs)	31	61	47	36
	Old (50 and above)	43	14	28	61
Gender	Male	97	100	47	94
	Female	3	0	53	6
Education	Elementary	0	0	31	0
	Secondary	6	0	47	0
	High School	14	0	22	81
	Graduate	3	11	0	19
	M.Sc.	66	22	0	0
	Ph.D.	11	67	0	0
Experience (min 3/2 max 40/30, mean 15.8/16)	Low (1-10 yrs)	46	36	94	16
	Medium (11-20 yrs)	20	28	6	81
	High (<20 yrs)	34	36	0	3
Family labours	1-2 persons	79	50	79	50
	3-5 persons	21	50	21	50
Renting labours/ staffs (Persons)	Minimum	1	4	0	9
	Maximum	500	350	50	45
	Mean	371	114	3	25
Capital (USD)	Minimum	16110	230150	632	3500
	Maximum	16110472	23014960	5052	378908
	Mean	2208991	2287925	2297	124845
Income/month (USD)	Minimum	8000	15000	316	3158
	Maximum	2500000	3222094	5852	239975
	Mean	15322	191715	1478	30439
Training receivedNo-training	100	93	100	53	
	Training (1 course)	0	7	0	47
Social participation	Member	66	39	0	0
	Office bearer	26	32	0	0
	Non-members	8	29	0	0

Service experience: Service experiences of Indian traders ranged from 3 to 40 years, with average of 15.8 years, whereas for Indian exporters they were having minimum 2 years of experiences and maximum of 30 years, with average of 16 years. From Table 3 it is clear that a large number of Indian traders were ranked under low experiences (1-10 years; 46 %); followed by high service experience (above 20 years; 34 %) and medium service experience (11-20 years; 20 %). The percentages of service experiences for exporters were the same for low and high service experiences (36 %), followed by medium service experiences (28 %).

For the service experiences of Vietnamese traders, data from Table 3 indicated that service experiences ranged from 1 to 20 years; and 3.8 years in average; whereas, these numbers for exporters were 8, 35 and 3.9 respectively. Majority of Vietnamese traders were under low experiences (94 %), followed by medium service experiences (6 %) and no one under high service experiences. However, for exporters, the majority were ranked under medium service experiences (81 %), followed by low group (16 %) and fewer in high group of experiences (3 %).

Family labour: Total family labour was divided into 2 groups i.e. 1-2 members and 3-5 members for both traders and exporters and both the countries. In India the number of traders and exporters, who had 1-2 members were 79.00 per cent and 21.00 per cent had 3-5 members, whereas it

was the same 50 per cent for two groups in case of Vietnam (Table 3).

Renting labour: Minimum renting labour for Indian traders was the lowest at one and highest at 500, with average of 371 labours. These numbers for Indian exporters were 4, 350 and 114 respectively. In case of Vietnam, traders had lowest renting labour at 0 and highest at 50, with the average of 3 renting labours; whereas these numbers for exporters were 9, 45 and 25 renting labours respectively.

Capital investment: The capital investment for business for traders and exporters in the two countries was calculated under USD. The time for calculation was August 2005 (That time 1 USD=43.45 Rs. and 1 USD = 15835 Dong Vietnam). The capital investment counted only working capital and not included fixed capital. The data are presented in the Table 3 for both India and Vietnam respondents.

Capital of Indian traders ranged from the lowest at 16110 USD to highest 6110472 USD, with the average of 2208991 USD; whereas for Indian exporters, these numbers were 230150, 23014960 and 2287925 respectively. The capital investment of Vietnamese traders ranged with the lowest at 632 USD, highest at 5052 and average was 2297 USD. The lowest capital for exporters was 5300 USD, highest 378908 USD and average was 124845 USD.

Through the data of renting labours and capital investment for traders and exporters of India and Vietnam, we can say that Indian traders and exporters have large business activities in rice export than those of Vietnam. The capital investment business between traders and exporters in India were not so wide as in case of those of traders and exporters in Vietnam.

Income per month: Monthly income for Indian traders ranged from 8000 to 2500000 USD and average was 153222 USD; whereas, it ranged from 15000 to 3222094 and average was 191715 USD in case of exporters. The monthly income of Vietnamese traders ranged lowest at 316, highest at 5852 and average was 1478 USD; whereas these numbers are 3158, 239975 and 30439 USD respectively for Vietnamese exporters.

Training received: The number of training received was very low (7% for Indian exporters and 47.00 per cent for Vietnamese exporters). The traders in both countries did not receive any training course. This problem might be the main constraints in getting awareness about rice export quality/standards and its marketing, which has been discussed later in this paper.

Table 4. Awareness of farmers about rice export quality/standards

Respondent	Level of awareness (scores)				
	Low (0-25)	Medium (26-50)	High (51-75)	Very high (76-100)	Total (%) (N=100)
Indian respondents	12 (24)	19 (38)	17 (34)	2 (4)	50 (100)
Vietnamese respondents	18 (36)	11 (22)	16 (32)	5 (10)	50 (100)
Total (N=100)	30 (30)	30 (30)	33 (33)	7 (7)	100 (100)

Social participation: The data presented in the Table revealed that Indian traders and exporters took part actively in social participation with 66 per cent membership, 26 per cent office-bearers and only 8 per cent were non-members. These percentages for Indian exporters were also high with 39, 32 and 29 per cent respectively. In contrast to this, no one in traders and exporters of Vietnam got membership in any social and religious organization and association.

Awareness about rice export quality and standards of the stakeholders

Awareness of the farmers

More than half of respondents in both India and Vietnam had from low to medium levels of awareness (30%) about rice export quality and standards (Table 4).

As shown in the Table 4 more than one third of respondents in both the countries got high to very high level of awareness (total 40% in which 33% for high and only 7% for very high level of awareness).

The results of more than half of farmers who got low to very low levels of the awareness seek attention of the extension and other concerning people and organizations to put in their planning and action so as to educate farmers of the both countries to improve the awareness about rice export quality and standards for promoting rice production and export in the future.

Awareness of extension personnel about rice export quality/standards

The study revealed that most of them (80%) had 'poor' and 'medium' levels of awareness (37.00 and 43.00% of respondents respectively). Very few district level

extension personnel had 'fair' level (20%) and no one was under 'good' level of awareness about rice export quality/ standards.

In case of block level, the results of 50.00 per cent of extension personnel were ranked under poor category of awareness. The percentages for 'medium' and 'fair' levels of awareness were 37.00 and 13.00 per cent respectively. It was also found that under block level, there was no extension personnel with 'good' level of awareness about these issues.

In general, the study concluded that 43, 40, 17 and 0 per cent of Indian extension personnel had 'poor', 'medium', 'fair' and good levels of awareness about rice export quality/standards, respectively.

In case of Vietnamese extension personnel, majority of them got 'poor' level of awareness (80 %) and remaining 20.00 per cent got 'medium' level. The very unhappy situation was that there were no extension personnel at village level ranked under 'fair' and 'good' levels. In case of district level, the result was much better than village level. They did not have 'poor' level but the number of extension personnel under 'medium' level was comparatively high (53 %). In comparison to village level, another good thing that they got 'fair' and 'good' level of awareness with 42 and 5 per cent (round number) respectively. However, the level of 'good' awareness was still very low.

The very low awareness level at block/village level and the number of nearly half of district levels both India and Vietnam's extension personnel under 'medium' level of awareness were a matter of concern, because they were the extensionists, who directly used to contact farmers to educate, encourage and mobilize them in rice production and export. Therefore, it needs to be emphasized upon training - especially on rice quality/ standards for export to improve awareness level of these extension personnel.

Awareness of traders and exporters about rice export quality and standards

Awareness of traders: The study showed that almost all Vietnamese traders were ranked under 'poor' level of awareness (81 %), whereas, this category for Indian traders was 23.00 per cent. However, the 'medium' category had high percentage for Indian traders (69 %) and Vietnamese traders got only 13.00 per cent. The 'fair' category was similar as very few were found in this in India as well as in Vietnam (8 and 6 % respectively). There were no traders in the two countries ranked under 'good' category.

The overall analysis for all traders, revealed that the highest percentage was in 'poor' category (43 %), followed by 'medium' category (40 %) and 'fair' category (17 %) and no trader in both the countries got 'good' level of awareness.

Awareness of exporters

The investigation further showed that more than half of Indian exporters got under 'medium' level of awareness (57 %), followed by 'poor' level (39 %) and 'fair' level of awareness was with only 4 per cent. Among Vietnamese exporters two third were under 'medium' level with 77.00 per cent, followed by 'poor' level with 16 per cent and then 'fair' level with 7 per cent.

On overall, 27.00 per cent exporters got 'poor', 68.00 per cent got 'medium' and 5.00 per cent were ranked under 'fair' level of awareness. There were no exporters, who had 'good' level of awareness in both the countries.

CONCLUSION

The study on the awareness of farmers found that more than half of respondents in both India and Vietnam ranked under low to medium levels of awareness about rice export qualities. In general, this number is 30 per cent each for low and medium levels of awareness.

The findings emphasize the immediate need for planning in the long term to improve the level of education of Vietnamese traders and exporters. It is highly imperative to plan and organise the training programmes to impart the knowledge regarding to rice export for all the farmers, extension personnel, traders and exporters in India and Vietnam to improve the awareness about rice export quality/standards for promoting rice export of the two countries.

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Effectiveness of Extension Services Delivered Under IVLP in Himalayan Hills

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ABSTRACT

This study was conducted to evaluate the performance of the extension activities undertaken in Institution-Village Linkage Programme in Almora district in NW Himalayas. The extension services catered in IVLP villages was found effective on elected indicators viz., awareness (73%), visits (18), field meetings (2), regularity (68%), field days (2), and supervision (5). It was observed that there was an increase in grain and straw yield by 39.14 and 31.26 per cent due to high yielding varieties 27.16 and 26.16 per cent due to balanced application of manures and fertilizers, 28.8 and 18.4 due to weed control, 23.57 and 25 per cent due to pest control, and 26.5 and 29.25 per cent due to line sowing. The additional returns were increased by Rs. 6344.35 due to use of improved technologies over traditional practices. This study showed that there was significant effect of adoption of improved agro-technologies over traditional practices.

During last five decades India has marched forward from grow more food campaign to self-sufficiency due to remarkable progress in agricultural research. However, mostly the farmers with large holding and better resources were benefited from the outcome of the green revolution. It was due to the fact that most of the research and development programmes were intensified for the irrigated plains belonging to resource rich farmers. The small and marginal farmers with small land holding, poor resource and diversified risk-prone farming system were ignored during the planning of research and development (ICAR 1999). Further, the farmers' actual perception, socio-economic conditions and resources were not taken care of during the course of technology generation. As a result, most of the technologies developed during the period could not prove their potential at farmers' fields. Keeping these points in view, the project Technology Assessment and Refinement through Institute Village Linkage Programme was initiated by ICAR to initiate research on farmers' field and assess the existing recommended technologies and identify the constraints in the adoption of particular technology.

Agricultural extension has been proved one of the major components of successful green revolution in India. But critics pointed about regional impact of green revolution which resulted in regional disparity particularly in deprived area like complex, diverse and risk prone (CDR) agriculture in hill agriculture (Singh and Jha, 2005). Hill agriculture has several other difficulties which make extension service together and challenging. Several extension programmes were launched by Government of India at national level concerned to state extension functionary among which training and visit lab to land programme (LLP).

Farmer's have evolved specific particular agricultural practices based on local situations and their vast experiences through ages and this project aims to incorporate their rich experiences in the assessment and refinement of technologies to make them more relevant and suitable to the farmers. Three villages, i.e., Pururа, Tallihat and Pulwari-Gunth in Garur block of district Bageshwar were selected to find out the problems in the existing farming system through participatory rural appraisal (PRA).

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But, despite all such programmes functioning by state agricultural department, it was felt that some more effective programme could be launched at national level and implemented through ICAR and SAUs so that the technological gaps of village areas could be made. With above impression, Institute Village linkage programme (IVLP) was launched. This institute also implemented the project in three villages of Almora district of Uttarakhand. The project has completed its full term, therefore, evaluation of effectiveness and productivity of extension services in the selected villages was carried out.

METHODOLOGY

This study was conducted in the villages representing hill and mountain agro-ecosystem. This is an ex-post facto study. All villages adopted under IVLP were selected for this study; besides, the adjoining villages were also selected to measure the impact of extension service in the adopted area. Except project interventions, other programmes were common in both IVLP and non-IVLP villages. At total of 200 farmers were selected as respondent for the study, in which 150 were adopted and 50 were non-adopted farmers. The effectiveness and productivity of the extension was measured using indicators suggested by Misra, 1997 and found suitable for this study.

Major problems faced by the farmers were identified through participatory rural appraisal (PRA). Available technologies in relation to each problem were studied and experiments were laid out to test these technologies for solving the problems of farmers belonging to different categories. These technologies were compared with farmers' practice to test their efficacy at farmers' fields and to refine them if needed on the basis of feedback received thereafter. For this, trials were conducted between 1999 and 2004 at farmers' field adopted under TAR-IVLP. The selected villages namely-Tallihat, Phulwari-Gunth and Puraura have both, rainfed as well as irrigated fields and farmers were selected to represent different categories and locations in the area. Only the single critical input related to particular intervention like seed of improved varieties, fertilizers, seed drill, herbicide, fungicide and insecticide were provided to the concerned farmers. All the field operations were carried out by the farmers themselves under the supervision of concerned scientist. The performance of intervention was regularly observed and corrective measures were suggested whenever required through on spot discussion.

RESULTS AND DISCUSSION

Effectiveness of extension services

Effectiveness as defined by a handbook on productivity management "the degree to which goals are attained" (Prokopenko, 1987). The IVLP was implemented with well defined social and economic goals. Hence, the attainment of these goals has been considered the effectiveness of the extension services catered under the project. The analyzed data (Table 1) showed that the awareness of the adopted farmers was found 73 per cent as compared to non-adopted farmers 26 per cent. Project workers were visiting frequently as compared to the state extension workers. At least two meetings per month were organized under the project at farmers' field as compared to non-IVLP villages. Project workers were more regular (68%) than village extension worker (5%). For popularizing the proven technology among farmers, two field days per year were organized under project, which was absent in non-IVLP villages. For proper implementation of the project intervention, supervision by the concerned scientist was done five times per month, whereas, the agriculture development officers were visiting once in a month.

The above discussion shows that the extent of the extension services was intensive under IVLP project and it was also effective on the selected indicators. The higher percentage of the indicators in the IVLP villages is the testimony.

Table 1. Effectiveness of extension serices

(N=200)

S. No.	Indicators	IVLP villages	Non-IVLP villages
1.	Awareness of farmers about the new agro-technologies (%)	73	26
2.	No. of visit by the extension workers (monthly)	18	2
3.	Field meetings (monthly)	2	0
4.	Regularity (%)	68	5
5.	No. of field days (per annum)	2	0
6.	Supervision (No. per month)	5	1

Productivity of the extension services

The productivity of the extension has been measured on the basis of two indicators viz., yield and yield index as suggested by Misra (1997). Yield of any crop depends upon several factors, therefore, yield enhancement are being presented along with the factors affecting yield of the selects crops.

Effect of high yielding varieties

Farmer in the adopted area generally uses the seed of local varieties for crop cultivation. Trial conducted to evaluate the performance of different improved varieties at farmers' field clearly showed the superiority of the HYV of targeted crops over local ones. Results illustrated in Table 2 revealed that in the case of spring rice, transplanted rice, irrigated wheat, rainfed wheat and finger millet with the inclusion of improved varieties the enhancement of 30-43, 14-58, 34-48, 25-36 and 29-32 per cent in grain yield; 10-36, 1-20, 23-64, 29-40 and 38-41 per cent in straw yield and additional return up to Rs. 5349, 11944, 11461, 4955 and 5230/ha, respectively were recorded. In case of lentil, grain yield was enhanced by 43 to 50 per cent over local variety and an additional return up to Rs. 5325 were recorded. By now, varieties like, VL Gehun 616 (Wheat); VL Dhan 206 (spring rice); Vivek Dhan 62 and

Table 2. Effect of high yielding varieties

Intervention	No. of farmers	Treatments	Grain			Straw			Additional Returns (Rs/ha)
			Yield q/ha	Add. yield		Yield q/ha	Add. yield		
				q/ha	%		q/ha	%	
HYVs of spring rice	50	Local Variety (FP)	16.5	-	-	30.3	-	-	-
		VL Dhan 206	23.6	7.1	43	41.1	10.8	36	5349
		Majhera 7	21.5	5.0	30	33.4	3.1	10	3046
HYVs of transplanted rice	20	Local Variety (FP)	39.7	-	-	53.7	-	-	-
		Pant Dhan 10	62.9	23.2	58	54.4	0.7	1	11944
		Vivek Dhan 62	51.0	10.3	28	64.7	11.0	20	70.13
		Pant dhan 11	54.7	15.0	38	50.3	-3.4	-	7106
		Vivek Dhan 83	45.3	5.6	14	55.1	1.4	3	3080
HYVs of irrigated wheat	50	Local Variety (FP)	27.1	-	-	42.3	-	-	-
		VL Gehun 829	42.4	15.3	56	55.6	13.3	31	11461
		VL Gehun 616	40.2	13.1	48	61.2	18.9	45	11015
		VL Gehun 421	38.5	11.4	42	69.4	27.1	64	11290
		VL Gehun 804	38.0	10.9	40	52.2	9.9	23	8233
		VL Gehun 738	36.3	9.2	34	62.6	20.3	48	8860
HYVs of rainfed wheat	50	Local Variety (FP)	15.3	-	-	25.3	-	-	-
		VL Gehun 616	20.8	5.5	36	35.3	10.0	40	4955
		VL Gehun 421	19.1	3.8	25	32.6	7.3	29	3486
		VL Gehun 738	19.9	4.6	30	35.3	10.0	40	4406
HYVs of lentil	50	Local Variety (FP)	7.05	-	-	-	-	-	-
		VL Masoor 4	10.05	3.0	43	-	-	-	4500
		VL Masoor 103	10.60	3.55	50	-	-	-	5325
HYVs of Soybean	50	Loval Variety (FP)	15.9	-	-	-	-	-	-
		VL Sya 2	23.6	7.7	48	-	-	-	9240
		VL Soya 21	22.5	6.6	42	-	-	-	7920
		VL Soya 47	24.8	8.9	56	-	-	-	10680
HYVs of Finger millet	50	Local Variety (FP)	16.1	-	-	32.8	-	-	-
		VL Mandua 146	21.3	5.2	32	45.4	12.6	38	5230
		VL Mazndua 149	20.8	4.7	29	46.2	13.4	41	5230

Pant Dhan 10 (transplanted rice); VL Soya 2 (Soyabean); VL Masoor 103 and VL Masoor 4 (lentil) and VL Mandua 146 and 149 (Finger millet) have made wide spread impact among the farmers. As a result most of the area under different crops has been covered by these varieties. Superiority of VL 616 at farmer field was also reported by Ved Prakash *et al.* (2002).

Increase in yield and returns due to balanced application of manures and fertilizers

Under irrigated condition, use of recommended fertilizers along with 10 t FYM/ha recorded additional 32 and 16 per cent grain yield of rice and wheat, respectively and 21 per cent straw yield in both the crop over the farmers practice of using only 20 kg N + 10 t FYM/ha. However, 50 per cent of recommended fertilizer along with FYM was also found to enhance the grain yield by 18 per cent and 8 per cent and straw yield by 14 per cent and 7 per cent in rice and wheat, respectively over farmer's practice. As a result, with the application of recommended fertilizer, additional net returns to the tune of Rs. 8870/ha and Rs.5632/ha were recorded in rice and wheat, respectively. Under rainfed condition, application of 40 kg N in two equal split as basal and top dressing enhanced the grain and straw yield of wheat by 53 and 58 per cent, respectively and provided additional returns of Rs. 7078/ha over farmers' practice of using no fertilizer. However, yield advantage shown by the application of 40 kg N in rainfed wheat and 50 per cent of recommended NPK + 10 t FYM/ha in irrigated wheat and rice convinced the farmer to adopt these practices (Table 3).

Yield enhancement due to weed control

Severe infestation of weeds in wheat under irrigated and in rice under irrigated as well as rainfed condition were reported as a serious problem in the area. Herbicidal treatments suggested were found quite effective against these weeds. Further, these treatments reduced the cost of labours involved in manual weeding. In case of transplanted and rainfed June seeded rice, application of Butachlor @ 1.5 kg a.i./ha enhanced the grain yield by 4 and 16 per cent and provided additional returns of Rs. 1257 and 2147/ha, respectively over farmers' practice (Table 4). In wheat, Isoproturon spray @ 1 kg a.i./ha was found effective against *Ranunculus* and other prominent weeds and enhanced the grain and straw yield by 47 and 41 per cent, respectively and additional returns of Rs. 11510/ha were registered. However, a refinement was made by suggesting sand/soil mixed application of the herbicide in case the sprayer is not available with resource poor farmers and it also provided yield levels comparable to Isoproturon spray. These findings are similar to earlier findings reported by Ved Prakash *et al.* (2002). Farmer in the adopted area as well as in nearby vicinity have adopted these technologies and most of them are applying these herbicides in their crops.

Yield enhancement due to insect/disease control

For insect control in rice and soybean, need based sprays of Ekalux (0.2%) enhanced the grain yield by 30 and 22 per cent and provided additional returns of Rs. 7159 and 4320/ha, respectively (Table 5). In case of

Table 3. Effect of nutrition management on yield and additional returns

Intervention	No. of farmers	Treatments	Grain			Straw			Additional Returns (Rs/ha)
			Yield q/ha	Add. yield		Yield q/ha	Add. yield		
				q/ha	%		q/ha	%	
Irrigated rice	30	20 kg N/ha+10 t FYM (FP)	40.2	-	-	65.7	-	-	-
		NPK (100:60:40)+10 t FYM	53.2	13.0	32	79.7	14.0	21	8870
		NPK (50:30:20)+10 t FYM	47.5	7.3	18	74.6	8.9	14	5147
Irrigated wheat	30	20 kg N/ha+10 t FYM (FP)	35.1	-	-	50.9	-	-	-
		NPK (100:60:40)+10 t FYM	41.5	6.4	16	61.7	10.8	21	5632
		NPK (50:30:20)+10 t FYM	38.9	3.8	8	4.3	8	3006	
Irrigated wheat	30	20 kg N/ha+10 t FYM (FP)	14.7	-	-	24.8	-	-	-
		NPK (100:60:40)+10 t FYM	20.0	5.3	36	33.5	8.7	35	4625
		NPK (50:30:20)+10 t FYM	22.5	7.8	53	39.3	14.5	58	7078

Table 4. Effect of weed control on yield and additional returns

Intervention	No. of farmers	Treatments	Grain			Straw			Additional Returns (Rs/ha)
			Yield q/ha	Add. yield		Yield q/ha	Add. yield		
				q/ha	%		q/ha	%	
Weed control in transplanted rice	15	Manual weeding (FP)	43.8	-	-	82.8	-	-	-
		Butachlor @ 1.5 kg/ha	42.5	-1.3	-	78.6	-4.2	-	-1355
		Butachlor + 1 HW	45.7	1.9	4	84.6	1.8	2	1257
Weed control in June seeded rice	15	Hand weeding (FP)	20.3	=	=	27.5	=	=	=
		Butachlor @ 1.5 kg/ha+1 HW	23.6	3.3	16	30.4	2.9	11	2147
Weed control in wheat	50	2-3 HW (FP)	30.3	-	-	43.1	-	-	-
		Iso. @ 1 kg/ha (spray)	44.5	14.2	47	60.9	17.8	41	11510
		Iso. @ 1 kg/ha (sand)	39.6	9.3	31	48.5	5.4	13	6537
		Iso. @ 1.5 kg/ha	44.1	13.8	46	54.0	10.9	25	10162

HW-Hand weeding; Iso.: Isoprutoran

Table 5. Effect of pest control on yield and additional returns

Intervention	No. of farmers	Treatments	Grain			Straw			Additional Returns (Rs/ha)
			Yield q/ha	Add. yield		Yield q/ha	Add. yield		
				q/ha	%		q/ha	%	
Insect control in rice	15	No control (FP)	36.6	-	-	66.9	-	-	-
		Ekalux @ 0.2%	47.5	10.9	30	76.9	10	15	7159
Insect control in potato	25	No. control (FP)	159.6	-	-	-	-	-	-
		Insecticides (Endosulfan +Phorate 10G)	188.2	28.6	18	-	-	-	14300
Insect control in soybean	15	No. control (FP)	16.1	-	-	-	-	-	-
		Ekalux @ 0.2%	19.7	3.6	22	-	-	-	4320
BLS disease in irrigated rice	15	No control (FP)	33.2	-	-	48.5	-	-	-
		NPK (100:60:40)	46.4	13.2	40	69.9	21.4	44	10156
		NPK (50:30:20) + 1 spray of mancozeb 0.25%	39.7	6.5	18	56	7.5	15	4515
		3 sprays of mancozeb 0.25%	39.6	6.4	19	60.9	12.4	26	5248
Late blight in potato	15	No control (FP)	159.6	-	-	-	-	-	-
		Endosulfan + Phorate 10 G	188.2	28.6	18	-	-	-	14300

potato, application of endosulphan (for defoliator) + phorate 10 G (for white grub) enhanced the tuber yield by 18 per cent, which enhanced the return by Rs. 14300/ ha. Application of Mancozeb (3 sprays @ 0.25% in rice against brown leaf spot and 4 sprays @ 0.2% in potato against late blight disease) enhanced to rice and potato yield by 19 and 54 per cent, respectively. However, in case of BLS of rice, application of recommended NPK showed superior yield levels due to better yield components.

Effect of sowing methods

Line sowing was found to improve the germination and plant stand in different crops. In case of wheat with small manual seed drill and local hand tool *kutla* enhanced the grain yield by 35 and 41 and straw

Table 6. Effect of methods/line sowing on yield and additional returns

Intervention	No. of farmers	Treatments	Grain			Straw			Additional Returns (Rs/ha)
			Yield q/ha	Add. yield		Yield q/ha	Add. yield		
				q/ha	%		q/ha	%	
Testing different methods of sowing	15	Broadcasting (FP)	24.8	-	-	36.7	-	-	-
		Line sowing with Kulta	35.0	10.2	41	51.0	14.3	39	8510
		Line sowing with seed drill	33.4	8.6	35	48.9	12.2	33	7198
Line sowing in June seeded rice	15	Broadcasting (FP)	20.0	-	-	24.3	-	-	-
		Line sowing (seed drill)	21.0	1.0	5	28.0	3.7	15	1102
Line sowing of spring rice	15	Broadcasting (FP)	22.6	-	-	29.5	-	-	-
		Line sowing (seed drill)	28.2	5.6	25	38.3	8.8	30	4264

yield by 33 and 39 per cent, respectively, over broadcast sowing and as a result additional return of Rs. 7198 and 8510/ha, were recorded (Table 6). Besides these benefits, line sowing also facilitated easy intercultural operations. After successful testing of seed drill in wheat, it was also tested in case of spring as well as June seeded rice. Line sowing with small manual seed drill also improved the germination and plant stand resulting in enhancement of 25 and 5 per cent in grain and straw yield by 30 and 15 per cent, respectively over broadcast sowing. These yield enhancements led to better additional returns than broadcast sowing.

CONCLUSION

The above study explicitly proved the effectiveness of Technology Assessment and Refinement through Institute Village Programme in improving the productivity and profitability of hill farming. Moreover, the dividend paid to the farmers due to adoption of improved agro-technologies. The technologies tested with farmers' participation will sustain for longer period as these were evaluated under their system with the resources available with them.

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An Assessment of Self-Esteem Among Women

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ABSTRACT

Self-esteem affects psychological health of women. The present study was carried out to evaluate self-esteem among women as per various socio-economic dimensions. In all, 200 women selected through multistage sampling methods were administered questionnaire and "Self-Esteem Scale for Women" (SESW) constructed by Kapadia and Verma (2000). The study reported that there was highly significant difference between working and non-working women and self-esteem achieved by them. Significant differences were also observed between self-esteem and marital and educational status of women. Highly significant differences were found between women's age and their self-esteem in social relations and career. Self-esteem in family relations had put forth significant association with women's age. Rural and urban women had shown highly significant association with self-esteem in career of women.

Self-esteem which is similar to self-efficacy refers to how we feel about ourselves (Duane, 1997). Self-esteem is the global evaluative dimension of the self. Self-esteem is also referred to as self-worth or self-image (John, 2007). Studies conducted in a western context reported find the relationship between gender and self-esteem and is in favour of male adolescents, with females having lower self-esteem levels (Block and Robins, 1993; Chubb *et al.*, 1997; Harper and Marshall, 1991; Klein 1995; Rumbaut, 1994). Two studies conducted in a non-western context have not found gender differences in self-esteem (Mwamwenda, 1991; Watkins and Yu, 1993). The status of women and their equality are linked with not only recognition and status of feminine tasks, but also recognition for generative functions or services rendered by family unit. Both men and women need to and should participate in the regenerative functions, not only for the sake of women's equality and status, to prevent reducing her to being a house slave, but also for the sake of manhood, to save him for being a money making machine, from getting alienated from himself and for giving him a chance to humanize himself or regenerate himself through the tasks of child care and homemaking (Vidya, 2001).

The objectives of the study were (a) to assess self-esteem among women; (b) to study self-esteem as per various socio-personal factors, and (c) to evaluate the various dimensions of self-esteem as per age and dwelling.

The focus of this study was self-esteem and the process of evaluating the self-negatively or positively. Self-efficacy is the level and strength of an woman's belief that she can successfully perform a given activity, have been examined given the similarity of this construct to self-esteem. This paper is an attempt of understanding and underlying structure of the self-concept which can contribute to the process of mediating change in self-esteem and improving psychological health.

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METHODOLOGY

One hundred respondents were selected through multistage sampling technique for the study, which included 50 working women, out of which 25 were from rural area and 25 from urban area and 50 non-working women, in which 25 were from rural area and 25 from urban area. The tools used to facilitate collection of data include questionnaire and "Self-Esteem Scale for Women" (SESW) constructed by Kapadia and Verma (2000). It comprised 41 items under the response of Most Often (MO), Sometimes (S) and Rarely (R). MO was scored as 3, while S was scored as 2 and R was scored as 1, in case of positive items. Whereas, in case of negative items, (MO) was scored as 1, while (S) was scored as 2, and (R) was scored as 3. The data were analyzed through statistical software namely SPSS computing percentage, chi-square value, levels of significance and degrees of freedom. The levels of significance were obtained at the p-values of <0.01, <0.05 and > 0.05. The p-values of <0.01 was regarded as highly significant. The p-value of <0.05 was considered at significant and p-value of >0.05 was calculated as insignificant. The total score of the scale regarding 'Self-Esteem for Women" was divided into 3 categories i.e., Low, Mdium and High. Low level of self-esteem comprised the scores upto 62 (50 per cent). Medium level of self-esteem comprised the scores up to 63-87 (50-70 per cent) and high level of self-esteem comprised the scores upto 80 (> 70 per cent). The Scale of "Self-Esteem for Women" was divided into 5 categories i.e.

Self-esteem in personal Life which comprised 15 items and levels of low, medium and high. Low level of self-esteem comprised the scores upto 22 (50%) medium level of self-esteem comprised the scores 23-31 (50-70%) and high level of self-esteem comprised the scores more than 31 (> 70%).

Self-esteem in family relations comprised 7 items and levels of low, medium and high. Low level of self-esteem comprised the scores upto 10 (50%), medium level of self-esteem comprised the scores upto 11-14 (50-70%) and high level of self-esteem comprises the scores upto 15 and more than (> 70%).

Self-esteem in social relations comprised 11 items and levels of low, medium and high. Low level of self-esteem comprised the scores upto 16 (50%) medium level of self-esteem comprised the scores upto 17-23 (50-70%) and high level of self-esteem comprised the scores upto 24 and more (>70%).

Self-esteem in career comprised 8 items and levels of low, medium and high. Low level of self-esteem comprised the scores upto 12 (50%), medium level of self-esteem comprised the scores upto 13-16 (50-70%) and high level of self-esteem comprises the scores upto 17 and more (>70%).

Age was divided into 3 categories i.e. low, middle and high. Low age group comprised the women respondents who were upto age of 18-20 years. Middle age comprised the women respondents who were upto age of 20-30 years. High age comprised the women respondents who were above 30 years. Family income was divided into 3 categories i.e., Low, Average and High. Low Family Income means when a family earns Rs. 3000 per month, Average Family Income means when a family earns Rs. 3000-7000 per month, and High Family Income when comprises a family earns of Rs. 7000 per month.

RESULTS AND DISCUSSION

Table 1 showed that women generally had medium or high level of self-esteem as per different variable. The low level of self-esteem was not found among any women. The high level of self-esteem in urban women was found by 24 per cent. Such differences between dwelling and self-esteem, were found insignificant (p-value >0.05) with the χ^2 value of 1.00 at the 1 degree of freedom. Women had medium level of self-esteem upto middle age group by 77.55 per cent. The medium level of self-esteem at high age group of women was also found by 82.35 per cent. Such difference between age groups and self-esteem were found insignificant (p-value>0.05) with the χ^2 value of 0.36 at the 1 degree of freedom.

It was also found that working women had medium level of self-esteem by 74.00 per cent. The high level of self-esteem among non-working women was found by 86.00 per cent. Such difference between status and self-esteem is found high significant (p-value <0.01) with the χ^2 value of 2.25 at the 1 degree of freedom. Women had medium level of self-esteem at graduate level by 90.91 per cent. The high level of self-esteem among highly educated women is found by 26.23 per cent. Such differences between educational status and self-esteem is found significant (p-value >0.05) with the χ^2 value of 3.80 at the 3 degree of freedom.

It was further found that (91.67 per cent) women had medium level of self-esteem in extended families. The high level of self-esteem among women in nuclear

familis was found in 25.58 per cent. Such difference between family type and self-esteem was found insignificant (p-value > 0.05) with the χ^2 value 1.97 at the 2 degree of freedom. It was observed that all separated women had medium level of self-esteem. The high level of self-esteem among divorced women was found by 33.33 per cent. Such differences between marital status and self-esteem was found by significant (p-value >0.05) with the χ^2 value of 6.86 at the 4 degree of freedom. Women had medium level of self-esteem at high level of family income by 85.00 per cent. The high level of self-esteem at average level of family income was found by 24.32 per cent. Such difference between family income and self-esteem was found insignificant (p-value >0.05) with the χ^2 value of 1.10 at the 2 degree of freedom.

Shamir (1986) hypothesized that gender, age, marital status and socio-economic status matter for depression partly because of associated differences in the availability of and for impact of the personal resources of mastery and self-esteem. Based on a large urban community sample (n=1,390), the findings however, failed to support the availability hypothesis in relation to marital status, provided only modest support in reference to age and gender, but yielded compelling support in relation to socio-economic status (SES). Significant differences were more pronounced among women and unmarried persons, such differences did contribute understanding observed gender or marital status variations in depression.

Self-esteem among women as per their age

Table 2 showed that equal percentage of women i.e. 50 per cent had low self-esteem in personal life upto middle and high levels of age respectively. The medium level of self-esteem in personal life was found among majority of women (51.85 per cent) at high level of age. The high level of self-esteem in personal life of women was found among 53.85 per cent women upto middle level of age. Such differences between self-esteem was personal relations and age was found insignificant (p-value >0.05) with the χ^2 value of 0.14 at the 2 degree of freedom. Thus, women upto middle age had high level of self esteem in personal life. While, women at high level of age had medium level of self-esteem in personal life. Andrew (1982) found the stressful effects of the work environment on personal functioning and the stress buffering value of work and family social resource among a representative community group of men and work. Work stressors had a great impact on women, but supportive social resources provided more attention of such effects among men than among women.

It was also found from Table 2 that majority of women had low self-esteem in family relations upto middle age. Equal percentage of women (50 per cent) had medium self-esteem in family relations upto middle and high levels of age respectively. The high level of self-esteem in family relations was found by 55 per cent women at high level of age. Such differences between self-esteem in family relations and age was found significant (p-value <0.05) with the χ^2 value of 2.31 with the 2 degree of freedom. Whereas women at middle age had low level of self-esteem in family relations. Thus, women at high level of age had high level of self-esteem in family relations.

Table 2 also showed that majority of women i.e. 54.55 per cent have low self-esteem in social relations upto middle age. The medium level of self-esteem in social relations of women was found by 56.72 per cent at high level of age. The high level of self-esteem in social relations of women was found by 63.64 per cent upto middle age. Such difference between self-esteem in social relations and age was found high significant (p-value >0.01) with the χ^2 value of 2.89 at the 2 degree of freedom. Thus, women at middle age had high level of self-esteem in social relations. While, women at high level of age had medium level of self-esteem in social relations. Majority of women i.e. 64.29 per cent had low level of self-esteem in career at high level of age. The medium level of self-esteem in career was found highly among women 66.67 per cent upto middle age. The high level of self-esteem in career of women was found by 63.64 per cent at high level of age. Such differences between self-esteem in career and age was found high significant (p-value >0.01) with the χ^2 value of 9.04 with the 2 degree of freedom. Whileas, women upto middle age had medium level of self-esteem in career.

Majority of women i.e. 52.00 per cent had medium level of overall self-esteem at high level of age. The high level of over all self-esteem of women was found high among 55 per cent upto middle age. Such differences between overall self-esteem and age is found insignificant (p-value >0.05) with χ^2 value of 0.36 at 1 degree of freedom. Women upto middle age had high level of overall self-esteem. While, women at high level of age had medium level of overall self-esteem. Rabin (1990) found that enhancement of self-esteem and self-efficacy can be an important contributing factor to both the prevention of psychological and physical illness and the maintenance of health.

Table 1. Self-esteem among women

(n=10

Variable	Self-Esteem						χ^2-valu
	Medium		High		Total		
	f	%	f	%	f	%	
Dwelling							
Rural	42	84.00	8	16.00	50	100.00	
Urban	38	76.00	12	24.00	50	100.00	1.00_1**
Total	**80**	**80.00**	**20**	**20.00**	**100**	**100.00**	
Age Group							
Low and Middle	38	77.55	11	22.45	49	100.00	
High	42	82.35	9	17.65	51	100.00	0.36_1**
Total	**80**	**80.00**	**20**	**20.00**	**100**	**100.00**	
Status							
Working	37	74.00	13	26.00	50	100.00	
Non-Working	42	86.00	7	14.00	50	100.00	2.250_1*
Total	**80**	**80.00**	**20**	**20.00**	**100**	**100.00**	
Educational status							
Illiterate	17	89.47	2	40.53	19	100.00	
High school	8	88.89	1	11.11	9	100.00	
Graduate	10	90.91	1	9.09	11	100.00	3.808_3*
Higher Education	45	73.77	16	26.23	61	100.00	
Total	**80**	**80.00**	**20**	**20.00**	**100**	**100.00**	
Family Type							
Nuclear	32	74.42	11	25.58	43	100.00	
Joint	37	82.22	81	7.78	45	100.00	1.997_2*
Extended	11	91.67	1	8.33	12	100.00	
Total	**80**	**80.00**	**20**	**20.00**	**100**	**100.00**	
Marital Status							
Unmarried	22	70.97	9	29.03	31	100.00	
Married	38	86.36	6	13.64	44	100.00	
Separated	7	100.00	-	-	7	100.00	6.861_4*
Divorced	10	66.67	5	33.33	15	100.00	
Widow	3	100.00	-	-	3	100.00	
Total	**80**	**80.00**	**20**	**20.00**	**100**	**100.00**	
Family Income							
Low	18	78.26	5	21.74	23	100.00	
Average	28	75.68	9	24.32	37	100.00	1.101_2*
High	34	85.0	6	15.00	40	100.00	
Total	**80**	**80.00**	**20**	**20.00**	**100**	**100.00**	

Row percentage

* p-value < 0.01, (highlysignificant); ** p-value ≤ 0.05, (significant); *** p-value >0.05 (insignificant)

Degree of freedom (d.f.) in subscripts of χ^2-value

Table 2. Self-esteem among women as per their age

(n=100)

Variable	Age Group						χ^2-value
	Medium		High		Total		
	f	%	f	%	f	%	
Self-Esteem in Personal life							
Low	3	50.00	3	50.00	6	100.00	
Medium	39	48.15	42	51.85	81	100.00	0.148_2***
High	7	53.85	46.15	13	100.00		
Total	**49**	**49.00**	**51**	**51.00**	**100**	**100.00**	
Self-Esteem in Family Relations							
Low	2	100.00	-	-	2	100.00	
Medium	29	50.00	29	50.00	58	100.00	2.361_2**
High	18	45.00	22	55.00	40	100.00	
Total	**49**	**49.00**	**51**	**51.00**	**100**	**100.00**	
Self-Esteem in Social Relations							
Low	6	54.55	5	45.45	11	100.00	
Medium	29	43.28	38	56.72	67	100.00	2.897_2*
High	14	63.64	8	36.36	22	100.00	
Total	**49**	**49.00**	**51**	**51.00**	**100**	**100.00**	
Self-Esteem in Career							
Low	5	35.71	9	64.29	14	100.00	
Medium	28	66.67	14	33.33	42	100.00	9.046_2*
High	16	36.36	28	63.64	44	100.00	
Total	**49**	**49.00**	**51**	**51.00**	**100**	**100.00**	
Overall Self-Esteem							
Low	-	-	-	-	-	-	
Medium	38	47.50	42	52.30	80	100.00	0.360_1***
High	11	55.00	9	45.00	20	100.00	
Total	**49**	**49.00**	**51**	**51.00**	**100**	**100.00**	

Row percentage

* p-value < 0.01, (highlysignificant); ** p-value ≤ 0.05, (significant); *** p-value >0.05 (insignificant)

Degree of freedom (d.f.) in subscripts of χ^2-value

Self-esteem among women as per their dwelling

Table 3 showed that majority of women i.e., 66.67 per cent had low self-esteem in personal life in urban areas. The medium level of self-esteem in personal life of women was found among 50.62 per cent in rural areas. The high level of self-esteem in personal life of women was found in 53.85 per cent women in rural areas. Such difference between self-esteem in personal life and dwelling was found insignificant (p-value >0.05) with the χ^2 value of 0.75 with 2 degree of freedom. Thus, women in rural areas had high level of self-esteem in personal life. Whileas, urban women had low level of self-esteem in personal life Hrycaiko (1997) found that self-esteem impacts specific factors such as physical self-efficacy, self-confidence, anxiety and perceived control in both male and females of all ages.

Table 3 also showed that equal percentage of women had low self-esteem in family relations in rural and urban areas respectively. The medium level of self-esteem in family relations was found among majority of women by 53.45 per cent in urban areas. The high level of self-esteem in family relations of women was found by 55 per cent women in rural areas. Such differences between self-esteem in family relations and dwelling was

found insignificant (p-value >0.05) with the χ^2 value of 0.67 with 2 degree of freedom. It is observed that women in rural area had high level of self-esteem in family relations. Thus, women in urban areas had medium level of self-esteem in family relations. Majority of women i.e. 54.55 per cent had low self-esteem in social relations in urban areas. The medium level of self-esteem in social relations of women was found by 53.73 per cent in urban areas. The high level of self-esteem in social relations of women was found by 63.64 per cent in rural areas. Such differences between self-esteem in social relations and dwelling was found insignificant (p-value >0.05) with the χ^2 value of 2.10 with 2 degree of freedom. Women in rural areas had high level of self-esteem in social relations and women in urban areas had low level of self-esteem in social relations.

It was also found from Table 3 that majority of women i.e. 64.29 per cent had self-esteem in career in urban areas. The medium level of self-esteem in career of women was found highly among 57.14 per cent in urban areas. The high level of self-esteem in career of women was found by 61.36 per cent in rural areas. Such differences between self-esteem in career and dwelling was found high significant (p-value ≤ 0.01) with the χ^2 value of 4.27 with the 2 degree of freedom. Majority of

Table 3. Self-esteem among women as per their dwelling

(n=100)

Variable	Dwelling						χ^2-value
	Medium		High		Total		
	f	%	f	%	f	%	
Self-Esteem in Personal life							
Low	2	33.33	4	66.67	6	100.00	
Medium	41	50.62	40	49.38	50	50.00	0.756_2***
High	7	53.86	6	46.15	50	5.00	
Total	**50**	**50.00**	**50**	**50.00**	**100**	**100.00**	
Self-Esteem in Family Relations							
Low	1	50.00	1	50.00	2	100.00	
Medium	27	46.55	31	53.45	58	100.00	0.676_2***
High	22	55.00	18	45.00	40	100.00	
Total	**50**	**50.00**	**50**	**50.00**	**100**	**100.00**	
Self-Esteem in Social Relations							
Low	5	45.45	6	54.55	11	100.00	
Medium	31	46.27	36	53.73	67	100.00	2.100_2***
High	14	63.64	8	36.36	22	100.00	
Total	**50**	**50.00**	**50**	**50.00**	**100**	**100.00**	
Self-Esteem in Career							
Low	5	35.71	9	64.29	14	100.00	
Medium	18	42.86	24	57.14	42	100.00	4.273_2*
High	27	61.36	17	38.64	44	100.00	
Total	**50**	**50.00**	**50**	**50.00**	**100**	**100.00**	
Overall Self-Esteem							
Low	-	-	-	-	-	-	
Medium	42	52.50	38	47.50	80	100.00	1.000_1***
High	8	40.00	12	60.00	20	100.00	
Total	**50**	**50.00**	**50**	**50.00**	**100**	**100.00**	

Row percentage

* p-value < 0.01, (highlysignificant); ** p-value ≤ 0.05, (significant); *** p-value >0.05 (insignificant)

Degree of freedom (d.f.) in subscripts of χ^2-value

women i.e. 52.50 per cent had medium level of overall self-esteem in rural areas. The high level of over all self-esteem of women was found highly among 60.00 per cent in urban areas. Such differences between overall self-esteem and dwelling was found insignificant (p-value >0.05) with the c^2 value of 1.00 with the 1 degree of freedom. It was observed that women in rural areas had medium level of overall self-esteem. Thus, women in urban areas had high level of overall self-esteem. Fontane (1996) studied that individuals with high self-esteem are more likely to engage in exercise regularly. Moreover, substantial number of experimental studies showed that the implementation of a consistent, and long term exercise programme has the effect of increasing self-esteem (Fox, 2000).

CONCLUSION

Women's feelings and thoughts about themselves fluctuate some what based on their daily experiences. Self-esteem was something more fundamental than the normal "ups and downs" associated with situational changes. Women upto middle age had high level of overall self-esteem; while, women at high level of age had medium level of overall self-esteem. Women in rural areas had medium level of over all self-esteem. Illiterate women had medium level of overall self-esteem and educated women had medium level of overall self-esteem. Women with higher educational status had high level of overall of self-esteem. Un-married women had high level of overall self-esteem. Whileas, married women have medium level of overall self-esteem. Working women had high level of overall self-esteem and non-working women had medium level of overall self-esteem. Similarly, women in nuclear families had high level of overall self-esteem, whereas women in joint and extended families had medium level of overall self-esteem. Women upto middle age had high level of self-esteem in personal and social life. While, women at high level of age had medium level of self-esteem in personal and social life. However, women upto middle age had medium level of self-esteem in career. Women in rural areas had high level of self-esteem in personal life, social and family relations. Whereas, women in urban areas had low level of self-esteem in personal life, family relations and social relations.

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Changes in Livelihood Security of Rural Women in Kerala

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ABSTRACT

The study was conducted in the Idukki and Ernakulam districts of Kerala with the general objective to find out the changes in livelihood pattern of the rural women, in context of increasing rate of urbanisation. Two villages were selected randomly from each district by random sampling method. Respondents were selected by random sampling method. Eighty respondents were selected at random from each vilage, which was again divided into two categories, viz., old age group (above 40 years) and young age group (20-40 years). Thus the total sample size constituted 160 respondents. Urban young group was having highest livelihood Security Index (LSI) value at 58.10, followed by urban old ground at 57.50. Rural young and rural old groups had LSI values of 54.74 and 55.98, respectively. Regarding the change in LSI values, there was a positive change in all the four groups over the past five year period. This was the maximum in case of urban old and urban young groups. The changes in the rural area were not much significant.

Agriculture and allied sectors are still considered as a major source of livelihood in Indian situation, where more than 60 per cent of the population depends on it. Earlier it was subsistence farming, where a farmer produced whatever quantity was necessary to sustain his farm and family. With the advancement of tchnology, there are a lot of changes in the society and its waves are reflected in the agricultural sector also. One of the key reasons for the change in the agricultural sector and the resultant change in the livelihood pattern of the society can be attributed to the phenomenon of increasing rate of urbanisation.

A livelihood comprieses the capabilities, assets (both material and social resources) and activities required for a means of living (DFID, 2000). Livelihoods are the sum of ways in which people make a living. A livelihood is environmentally sustainable when it maintains or enhances the local and global assets in which livelihooods depend, and has net benecicial effects on other livelihoods. A livelihoood is socially sustainable which can cope with and recover from stress and shocks, and provide for future generations. (DFID, 2000). In its simplest form livelihood security is the abilityof a household to meet its basic needs like food, health, shelter, and minimal levels of income, basic education and community participation.

In Indian agriculture, rural women plays a vital role and participate in all stages of crop production, as they constitute 50 per cent of rural labour force. Most of the women perform various works for their livelihood and agriculture is considered as the biggest unorganized sector where large number of Indian rural women take part actively.

These rural women who work in the farm participate in a wide range of farm activities by slogging alongside with men in the field as well as taking care of the home and children, thereby performing a dual role that of a homemaker and of a partner in the farming activities outside the home. The 2001 census data indicate that 44.62 per cent of women are working as agricultural labourers and 32.35 per cent as cultivators. Work participation rate by women is 25.67 percent.

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METHODOLOGY

The study was undertaken with the general objective to find out the changes in the livelihood pattern of the rural women, as influenced by the increasing rate of urbanisation. It was conducted, in the Idukki and Ernakulam districts of Kerala. Two villages were selected randomly from each district by random sampling method. Respondents were selected at random from each village, which was again divided into two categories, viz., old age group (above 40 years) and young age group (20-40 years). Thus the total sample size constituted 160 respondents. The four groups of respondents are peri urban young, peri urban old, rural young and rural old group.

The data were collected from the individual women respondents through personal interview with the help of a structured interview schedule. The data regarding the variables for the present situation as well as five year back period were collected from the respondents, by the recall method and the changes during the five year period was found out.

The livelihood security was operationalised as adequate access to income and other resources to meet basic needs including food and nutrition, health facilities, clean environment, habitat facilities, educational opportunities and community participation and social integration. In order to measure the livelihood security of rural households, a Livelihood Security Index (LSI) was developed. Baby and Singh (2003) used similar method to find the household livelihood security in Kerala. The components of LSI were operationalised as given below:

(a) Food security : It was operatinioalised as available and access to balanced food at household level.

(b) Occupational & financial security: It was operationalised as the access to a regular and satisfied employment and sound financial condition of the respondents.

(c) Habitat security: It included housing with basic amenities.

(d) Educational security: It included the educational level of the family and access to educational facilities including higher education.

(e) Health security : It included the health status of the famly and access to health care facilities.

(f) Social security: It involved social participation and social status of the family.

(g) Environmental security : It included a pollution free environemnt, access to water resources, eco-friendly farm management practices and protection from flood or drought conditions.

Thirty eight items covering the seven components of livelihood security were thus selected initially. The selected items were pre-tested on a sample of thirty women in a non-sampling area, the Kollam district of Kerala. The items, which were found irrelevant, were dropped. Thus, thirty two items covering the seven compoents of livelihood security constituted the final indicators for LSI.

RESULTS AND DISCUSSION

The LSI of the respondents was calculated for the individual respondents and the mean index was found out for each group also. Comparison of LSI and its components were done in all the four groups separately.

The data in Table 1 indicate the mean LSI of each group of respondents, at present time as well as before five years. The changes in their livelihood security can be understood from these LSI values. Peri urban young group was having highest LSI value at 58.10, followed by peri urban old group at 57.50. Rural young and rural old groups had LSI values of 54.74 and 55.98, respectively. Regarding the change in LSI values, there was a positive change in all the four groups over the past five year period. This was maximum in case of peri urban

Table 1. Livelihood Security Index of respondents

Particular	2004-05				1999-2000			
	Peri urban young	Peri urban old	Rural young	Rural old	Peri urban young	Peri urban old	Rural young	Rural old
Mean	58.10	57.50	54.74	55.98	54.64	53.65	54.2	55.96
SD	7.97	8.36	8.18	6.75	9.37	9.77	7.46	8.37

Table 2. Comparison of Mean LSI values of the respondents

(N=160, n = 40)

Mean	2004-05	1999-2000	t-value
Peri urban Young	58.10	54.64	2.28**
Peri urban Old	57.5	53.65	2.27**
Rural Young	54.74	54.2	0.4
Rural Old	55.98	55.96	0.02

** Significant at 1% level

old and peri urban young group. The changes in the rural area were not much significant.

From a comparesion of mean LSI values, among the present LSI values and LSI values of five year before period, within the same group of respondents, we can understand whether there was significant improvment or decline in their livelihood security over the past five year period (Table 2). There was significantly positive change in case of both peri urban young and peri urban old groups, which was significant at 1 per cent level, as evident from t-values given in the table. The changes in case of rural young and rural old group were also in the positive direction, but it was not significant statistically.

The data in Table 3 provide the values of seven different components of LSI. Food security was maximum in case of Peri urban old group, which had been improved from past five year period in case of peri urban area respondents, whereas it had been decreased in case of respondents in rural area. The same trend was observed in case of occupational and financial security. But in case of peri urban old group there had been a decrease in occupational and financial security from past five year period. The decrease was shown by both young and old groups in rural area also. This might be mostly due to their retirement in case of old group of respondents. In case of young respondents it might be due to uncertainty in the occupation, especially for those working in private sectors. Regarding health security, rural old group had the maximum index at 0.64, followed by rural young group at 0.63. The health security had not been changed for any of the groups over the past five year period. In case of educational security, maximum index was for peri urban young group at 0.50. Regarding the changes in the educational security over the past five year period, it was most significant positive change in case of respondents from rural area, whereas the change was positive in peri urban areas also. With respect to habitat security, it was the maximum in case of respondents from peri urban area with 0.94 and 0.91 in young and old group, respectively. There was a considerable increase in habitat security of respondents from peri urban area, whereas it had shown decline in respondents from rural areas. In case of environmental security, rural old group was having the highest index at 0.82, followed by rural young group at 0.79. The least index was for peri urban young group at 0.32. Regarding the changes in environmental security, a drastic decrease was shown by respondents from both peri urban and rural areas. In case of social security, the highest index was shown by peri urban young grouip, followed by peri urban old group. Regarding the changes in social security index, there had been an increase in case of respondents from peri urban area and a decrease in case of respondents from rural area.

Table 3. Components of LSI of the respondents

(N=160, n= 40)

Components	2004-05				1999-2000			
	Peri urban young	Peri urban old	Rural Young	Rural Old	Peri urban young	Peri urban old	Rural Young	Rural Old
Food security	0.41	0.46	0.38	0.36	0.39	0.40	0.41	0.43
Occupational/financial Security	0.68	0.58	0.56	0.59	0.63	0.61	0.60	0.64
Health security	0.61	0.59	0.63	0.64	0.61	0.59	0.63	0.64
Educational security	0.50	0.48	0.40	0.42	0.48	0.43	0.36	0.34
Habitat security	0.94	0.91	0.72	0.74	0.74	0.73	0.75	0.77
Environmental security	0.32	0.33	0.49	0.50	0.70	0.68	0.79	0.82
Social security	0.50	0.48	0.32	0.33	0.32	0.23	0.51	0.50

Table 4 revealed the results of comparison of components of LSI. In case of peri urban young and old group, there was significant difference in components such as habitat security, environmental security and social security, which was significant at 1% level. There was no significant difference in components like food security, occupational/financial security, health security and educational security. In case of rural young group, there was significant difference in components such as environmental security and social security, which was significant at 1% level. Regarding rural old group, food security, environmental security and social security indices differed significantly at 1% level, whereas educational security index differed significantly at 5% level.

LSI was an indication of the condition of livelihood of the respondents. It was also indicative of the seven components in it. Whle considering the change in LSI, the maximum change was in peri urban area, which might be an indication of positive influence of peri urbanisation. But the range of LSI was also the maximum in peri urban area, which indicated that there was vast difference between respondents having higher and lower LSI values. This could be a reflection of the social disparities in a peri urban society. The changes in LSI in rural area were very much negligible. This could be better expained if we examined the components of LSI and the changes in them as well. The significantly different LSI values in peri urban area, in both young and old respondents groups might be a result of the changes occurring in their lifestyle due to increasing urbanisation. This provided a clear idea about how the livelihoods of women had been changed in past five years, and one of the reasons for it might be the influence of process of urbanisation.

There were slight improvements in food security index, occupational/financial security index, and educational security index. This could be explained while looking into the background of the study area. Kerala was considered as a well developed state even so many yeas before, as compared to other Indian states. Also the study considered the changes during the time period of past five years, during which there might not be drastic changes. There was considerable improvement in habitat security index in all the groups. This might attributed to increased income as well as urge of the people to have better habitat facilities for themselves. There had also been an improvement in social security index in peri urban area, but a decline in the same in rural area. This might be due to increased social interactions in home and work places in peri urban area. There had been a drastic decline in the environmental security in all the groups, reflecting the deterioration of the environmental quality in both peri urban and rural area. There was considerable improvement in educational security and food security of rural old group, which might be attributed to the increase in income over the five year period.

Table 4. Comparison of components of LSI of the respondents

Mean	2004-05	1999-2000	t-value
Peri urban young group (n=40)			
Food security	0.41	0.39	0.23
Occupational/financial security	0.68	0.63	0.79
Health security	0.61	0.61	0.00
Educational security	0.50	0.48	0.55
Habitat security	0.94	0.74	4.44**
Environmental security	0.32	0.70	15.05**
Social security	0.50	0.32	5.45**
Peri urban old group (n=40)			
Food security	0.46	0.40	1.19
Occupational/financial security	0.58	0.61	0.68
Health security	0.59	0.59	0.00
Educational security	0.48	0.43	1.02
Habitat security	0.91	0.73	3.82**
Enviromental security	0.33	0.68	14.7**
Social security	0.48	0.23	6.8**
Rural young group (n=40)			
Food security	0.38	0.41	0.62
Occupational/Financial Security	0.56	0.60	0.8
Health security	0.63	0.63	0.00
Educational security	0.40	0.36	0.79
Habitat security	0.72	0.75	0.64
Environmental security	0.49	0.79	12.39**
Social security	0.32	0.51	5.08*
Rural old group (n=40)			
Food security	0.36	0.43	2.17**
Occupationa/Financial security	0.59	0.64	1.21
Health security	0.64	0.64	0.00
Educational security	0.42	0.34	1.98*
Habitat security	0.74	0.77	0.61
Enviromental security	0.50	0.82	10.21**
Social security	0.33	0.50	3.91**

* Significant at 5% level
** Significant at 1% level

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Perceived Attributes of Drudgery Reducing Implements in Animal Husbandry

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ABSTRACT

The present investigation was carried out to study the attributes of drudgery reducing tools and implements used in animal husbandry operations as perceived by farm women. The study was conducted in Nazafgarh and Kanjhawala Blocks of Delhi. From these blocks, a total of nine villages were purposively selected where 36 Self Help Groups (each group consisting of 15 farm women) were formed. A total of 540 farm women comprised sample for the study. Based on the drudgery assessment, the improved tools and implements were introduced among the members of the SHG's. The important tools included: rake for cleaning of cattle shed and collection of dry and green fodder, showel for collection and cleaning of dung; and wheel barrow for carrying dung and fodder to replace carrying load on head. Rogers (1983) attributes with necessary modification were employed to study the attributes of improved animal husbandry tools and implements. The findings of the study clearly indicate that the improved tools and implements related to animal husbandry are significantly useful to reduce fatigue and drudgery, thereby enhance efficiency and leisure time of farm women.

Farm animals are sources of food, fibre, power, manure, hides, skin, bones, etc. Livestock plays an important role in the country's economy, contributing about 9.0 per cent to the G.D.P. Livestock provides sustenance to millions of people in vast arid and drought prone areas of the country. India has a distinguished livestock heritage and place of pride in the world. Animal husbandry is broadly divided into aspects like feeding, breeding, management and health. Though women are extensively involved in animal husbandry, yet they are lacking scientific information and training about improved practices and drudgery reducing tools and implements. According to Singh & Gite (2007) the tools/ equipment have been primarily developed for male workers and given for use to women workers which ultimately result in lower system efficiency and occupational health problems. Furthermore, women friendly and ergonomically designed tools and implements need to be evaluated and refined based on feedback. Scientific and technological inputs and interventions are thus required in this area to relieve farm women from physical and mental strain. Keeping this in view, some improved tools / equipment relating to animal husbandry viz. rake, wheel barrow and showel were introduced among farm women and the present investigation was carried out with the objective to study the attributes of improved implements in animal husbandry as perceived by farm women.

METHODOLOGY

The study was conducted under the NATP-Mission Mode Project entitled "Empowerment of Women in Agriculture" in Nazafgarh and Kanjhawala Blocks of Delhi. From these blocks, a total of nine villages were purposively selected in which 36 Self Help Groups (each group consisting of 15 farm women) were formed. Thus, the sample for the study comprised of 540 respondents (farm women). The activities performed by farm women in animal husbandry were documented and on the basis of drudgery assessment by paired comparison technique,

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the tools and implement for animal husbandry were introduced among the rural women. The important tools included the following: rake for cleaning of cattle shed and collection of dry and green fodder; showel for collection and cleaning of dung; and wheel barrow for carrying dung and fodder to replace carrying load on head. Subsequent upon introduction of these implements, the training interventions were implemented among farm women to handle the improved equipments. The data were collected after an intervening period of three months, through specially designed pre-tested interview schedule. Rogers (1983) attributes of innovations for adoption were considered with necessary modification in order to study the attributes of improved animal husbandry tools and implements. The data were analyzed and interpreted accordingly.

RESULTS AND DISCUSSION

To reduce drudgery of farm women in animal husbandry, appropriate interventions were made in the form of improved tools and implements and skill oriented trainings were imparted to selected respondents.

Rake

In order to reduce drudgery in cleaning of cattle shed "rake" was introduced among farm women who used it for collecting dry fodder in the cattle shed. In the fields they used rake for mixing seeds in soil as well as for collecting leaves and field waste after harvesting. These respondents used rake for collecting dry fodder as well as green fodder. The relevant results are presented in Tables 1 and 2.

Table 1 shows that all the respondents opined that rake helps in saving time during collection of dry fodder. In case of green fodder collection (Table 2) only 4.62 per cent agreed that rake helped in saving time, while 60.00 per cent respondents disagreed and 35..37 per cent were not able to decide about this issue. Regarding saving in terms of money, 7.40 per cent of respondents were undecided and 92.60 per cent disagreed that rake helped in saving money both in case of dry and green fodder collection. All the respondents agreed (in both cases of dry and green fodder collection) regarding the good work capacity, and need for rake. Compatibility and simplicity of the rake was rated high by all the respondents. They were of the view that family members will not object if it is used by them and the two kinds of rakes will not affect their traditional norms and values, society at large will permit them to use it, it is easy to handle & maintain, and learning for its use is not a difficult affair. In case of trialability and applicability of the implement, 100 per cent of the respondents (in both cases) agreed that it can be tested in field itself, one can experiment it on a small scale, and it is applicable in field situations.

The data in Tables 1 and 2 also reveal that 55.56 per cent of the respondents agreed and 44.44 per cent were undecided that the rake can increase productivity. In case of dry fodder, 53.70 per cent respondents were undecided and 46.30 per cent disagreed with the above statement. Cent per cent respondents agreed in both the cases (dry & green fodder) that the results of rake are visible in terms of increase in efficiency.

The respondents further reported that rake does not require much cost and effort in maintenance. All the respondents agreed with these statements. However, one third of the respondents were undecided and 62.97 per cent were of the view that the cost was comparatively high and needs to be reduced.

In case of use of rake for dry fodder, 96.30 per cent respondents agreed that it helped in reducing health hazards, but in case of its use for green fodder, 60.00 per cent respondents disagreed, 35.37 per cent were undecided and only 4.63 per cent agreed with this issue. For collection of dry fodder, 100 per cent respondents agreed that rake saved time and energy and it had effectiveness in work. In case of collecting green fodder, 60 per cent respondents disagreed, 35.37 per cent were undecided and only 4.63 per cent agreed with these statements respectively. Rake helps in improving posture was reported by 97.96 per cent respondents in case of collection of dry fodder. However, in case of collecting green fodder, 37.03 per cent agreed, 46.30 per cent were undecided and only 16.67 per cent disagreed with the statement that rake helps in improving posture. Thus, if cleaning of cattle shed is done by rake, it will reduce much drudgery and health hazards and save time. The rake was found to be an appropriate implement (for dry fodder) in terms of attributes of relative advantage, compatibility, trialability, observability, utility, cost and applicability. Proper use of rake can also increase the work efficiency of farm women.

Wheel Barrow

The data pertaining to attributes of improved implement (Wheel Barrow) as perceived by farm women are presented in Table 3.

The data for wheel barrow presented in Table 3 indicate that one fifth of the respondents disagreed and one fifth were undecided that wheel barrow saved money.

Table 1. Attributes for improved implement (Rake)as perceived by farm women

(N=540)

Implement: Rake (Dry fodder)				
S.No.	Attributes	Agree	Undecided	Disagree
1	**Relative Advantage**	(%)	(%)	(%)
	a Time saving	100.00	-	-
	b Money saving	-	7.40	92.60
	c Work capacity enhanced	100.00	-	-
	d Need based	100.00	-	-
2	**Compatibility**			
	a No objection by family members	100.00	-	-
	b Its use will not affect their traditional norms/ values	100.00	-	-
	c The society permits them to use it	100.00	-	-
3	**Simplicity**			
	a Easy to handle	100.00	-	-
	b Easy maintenance	100.00	-	-
	c Easy to learn	100.00	-	-
4	**Trialability**			
	a One can experiment on a small scale	100.00	-	-
	b It can be tested in field itself	100.00	-	-
5	**Observability**			
	a Increase productivity	-	53.70	46.30
	b Increase efficiency	100.00	-	-
6	**Utility**			
	a It is useful in terms of reduced health hazards	96.30	3.70	-
	b Saving of time and energy	100.00	-	-
	c Improved posture	97.96	2.04	-
	d Effectiveness in work	100.00	-	-
7	**Cost**			
	a Its cost is comparatively less	-	37.01	62.96
	b It does not require much cost in maintenance	100.00	-	-
8.	**Applicability**			
	a It is applicable in field situation	100.00	-	-

Its use for saving time was agreed by all the respondents, suggesting that its work capacity was more and they had a need for it. About the compatibility, simplicity, trialability and applicability of the wheel barrow, 100 per cent respondents agreed that the family members will not object if it is used by them, its use will not affect their traditional norms/ values, society can permit them to use it, it is easy to handle and maintain, learning its use is not a difficult affair, one can experiment on a small scale, it can be tested in field itself, and it is applicable in field situation. Observability in terms of enhanced productivity was perceived by only 4.0 per cent of the respondents whereas 80 per cent were undecided and 16 per cent disagreed. However, cent per cent of the respondents agreed that the results of its use were visible. About the utility of wheel barrow 100 per cent respondents agreed that it saves time and energy and it is effective in work. Regarding reduction in health hazards, 96.00 per cent respondents were in favour of it. While 24.00 per cent respondents disagreed that it is useful in improving

Table 2. Attributes for improved implement (Rake) as perceived by farm women

Implement: Rake (Green fodder) **(N=540)**

S.No.	Attributes	Agree (%)	Undecided (%)	Disagree (%)
1.	**Relative Advantage**			
	a Time saving	4.62	35.37	60.00
	b Money saving	-	7.40	92.60
	c Work capacity enhanced	100.00	-	-
	d Need based	100.00	-	-
2	**Compatibility**			
	a No objection by family members	100.00	-	-
	b Its use will not affect their traditional norms/ values	100.00	-	-
	c The society permits them to use it	100.00	-	-
3	**Simplicity**			
	a It is easy to handle	100.00	-	-
	b Easy maintenance	100.00	-	-
	c Easy to learn	100.00	-	-
4	**Trialability**			
	a One can experiment on a small scale	100.00	-	-
	b It can be tested in field itself	100.00	-	-
5	**Observability**			
	a Increase in productivity	55.56	44.44	-
	b Increase in efficiency	100.00	-	-
6	**Utility**			
	a It is useful in terms of reduced health hazards	4.63	35.37	60.00
	b Saving of time and energy	4.63	35.37	60.00
	c Improved posture	37.03	46.3	16.67
	d Effectiveness in work	4.63	35.37	60.00
7	**Cost**			
	a Its cost is comparatively less	-	37.03	62.97
	b It does not require much cost in maintenance	100.00	-	-
8.	**Applicability**			
	a It is applicable in field situation	100.00	-	-

posture, 72.00 per cent were undecided and only 4.00 per cent disagreed. About the cost of wheel barrow, all the respondents agreed that it does not require much cost in maintenance. Majority of respondents (84 %) disagreed and 16 per cent were undecided that the cost of it is comparatively less.

Wheel barrow is also very easy to use. It helps in carrying load easily instead of carrying load on head. Carrying load on head was also found to be the activity involving great drudgery as perceived by the respondents. It saves their time, energy and also safeguards them from health hazards. Hence, the respondents have found it to be a very relevant, drudgery reducing implement.

Showel

The data pertaining to attributes for improved implement (Showel) as perceived by farm women are summarized in Table 4.

Another intervention for reducing drudgery in animal husbandry was Showel. Table 4 reveals that a large

Table 3: Attributes for improved implement (Wheel Barrow) as perceived by farm women
Implement: Wheel Barrow **(N=540)**

S.No.	Attributes	Agree (%)	Undecided (%)	Disagree (%)
1	**Time saving**			
	a Money saving	100.00	-	-
	b Work capacity enhanced	-	20.00	80.00
	c Need based	100.00	-	-
2	**Compatibility**			
	a No objection by family members	100.00	-	-
	b Its use will not affect their traditional norms/ values	100.00	-	-
	c The society permits them to use it	100.00	-	-
3	**Simplicity**			
	a It is easy to handle	100.00	-	-
	b Ease maintenance	100.00	-	-
	c Easy to learn	100.00	-	-
4	**Trialability**			
	a One can experiment on a small scale	100.00	-	-
	b It can be tested in field itself	100.00	-	-
5	**Observability**			
	a Increased productivity	4.00	80.00	16.00
	b Increased efficiency	100.00	-	-
6	**Utility**			
	a It is useful in terms of - reduced health hazards	96.00	4.00	-
	b Saving of time and energy	100.00	-	-
	c Improved posture	24.00	72.00	4.00
	d Effectiveness in work	100.00	-	-
7	**Cost**			
	a Its cost is comparatively less	-	16.00	84.00
	b It does not require much cost in maintenance	100.00	-	-
8.	**Applicability**			
	a It is applicable in field situation	100.00	-	-

majority of the respondents (97.3%) agreed that showel helps in saving time during dung collection. However 86.20 per cent respondents disagreed that showel helps in saving money. Majority of respondents (97.22%) agreed that it increases work efficiency, whereas only 2.78 per cent disagreed with this issue. Only 18.52 per cent respondents felt that it was need based while 66.66 per cent did not have any need for this and 14.82 per cent were undecided. About its compatibility, 18.51 per cent respondents agreed that family members would not object to them for using this. The respondents also felt that it was easy to learn and use. Regarding observing visible increase in efficiency cent per cent respondents felt that it increased efficiency and one can experiment and test it in field itself. Majority of respondents (85.20%) did not go with the statement that it can increase productivity and majority of the respondents (52.03%) did not agree to its utility in terms of reducing health hazards, improving posture and proficiency in work. A large majority i.e 92.59 per cent respondents agreed that it saves time and energy.

Table 4. Attributes for improved implement (showel) as perceived by farm women
Implement: Showel **(N=540)**

S.No.	Attributes	Agree (%)	Undecided (%)	Disagree (%)
1	**Relative Advantage**			
	a Time saving	97.30	0.90	1.85
	b Money saving	-	13.88	86.20
	c Work capacity enhanced	97.22	0.00	2.78
	d Need based	18.52	14.82	66.66
2	**Compatibility**			
	a No objection by family members	18.51	33.40	48.14
	b Its use will not affect their traditional norms/ values	27.77	3.70	68.60
	c The society permits them to use it	27.78	3.71	68.51
3	**Simplicity**			
	a Easy to handle	70.00	-	30.00
	b Easy maintenance	100.00	-	-
	c Easy to learn	100.00	-	-
4	**Trialability**			
	a One can experiment on a small scale	100.00	-	-
	b It can be tested in field itself	100.00	-	-
5	**Observability**			
	a Increased productivity	-	14.80	85.20
	b Increased efficiency	100.00	-	-
6	**Utility**			
	a It is useful in terms of reduced health hazards	18.52	29.45	52.03
	b Saving of time and energy	92.59	0.92	6.49
	c Improved posture	18.52	14.81	66.67
	d Effectiveness in work	14.82	27.78	57.40
7	**Cost**			
	a Its cost is comparatively less	30.00	31.48	38.52
	b It does not require much cost in maintenance	100.00	-	-
8.	**Applicability**	62.96	37.04	-
	a Time Saving	80.00	-	20.00

Regarding the cost of showel, one third of the respondents agreed to its affordable cost. All the respondents were in favour of this cost in maintenance.

It was found that the society did not permit farm women to use the showel because of its uncomfortable size and shape. The women themselves were shy to use this implement. Hence, the showel was perceived high only on attributes such as relative advantage (except need), simplicity, trialability, observability and applicability. Certain modifications are essential to suit the local community and improve its acceptability in terms of its size and shape.

CONCLUSION

Drudgery reducing tools and implements related to animal husbandry practices are very useful for farm women to reduce their fatigue and physical strain. This will ultimately lead to overall efficiency and allow the

farm women some leisure time to utilize for other household activities and entertainment. It can be concluded that the improved tools and implements like rake, showel and wheel barrow can considerably reduce the drudgery and fatigue in animal husbandry practices and improve overall working efficiency of farm women. These need to be promoted among the farm women with suitable modifications based on their feed-back.

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Awareness of Fraudulent Practices and Testing of Food Items

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ABSTRACT

The study was aimed to determine the level of awareness amongst urban respondents regarding prevalent fraudulent practices in food items and to test the samples of food items. The study was carried out tin two phases viz., field survey and laboratory testing. For accuracy and authenticity of survey data, it was collected from four different zones of Ludhiana city and total of 120 respondents were selected. For laboratory testing, on the basis of field survey and literature available seven food items (turmeric powder, chilli powder, coriander powder, black pepper (whole), salt, jaggery and honey) were selected for the purpose of testing. The results of the field survey revealed that awareness was highest for fraudulent practices like adulteration, imitation, short weights and measures and high pricing whereas there was low awareness for misleading advertisements, lack of standard marks and allurement through attractive packaging. Regarding action taken by the respondents against these fraudulent practices, majority of the respondents were taking action against fraudulent practices in case of dry food items followed by processed and fresh food items. Regarding type of action results showed that majority of the respondents reported to shopkeeper if they noticed any malpractice followed by respondents who stopped visiting that particular shop. Few respondents filed complaint in consumer court and wrote to the newspapers. Regarding reasons for not taking action against fraudulent practices, majority of the respondents revealed that long cumbersome procedure was the main reason. It was followed by respondents who reported reason as non-existence of consumer forum in the vicinity and they also felt helpless. Few respondents were unaware of consumer rights and others were unfamiliar with the procedure of lodging complaints. Testing of food items revealed that chilli powder, coriander powder and black pepper (whole) and jaggery were the most adulterated food items.

Resorting to any malpractice by businessman in order to earn quick profit and thus cheating the consumer is fraud. Now-a-days there are number of fraudulent practices prevalent in the market place, for which consumer may or may not be aware. Consumers are the largest economic group in any country. They are the nucleus around which all the economic activities move. In an economy which is largely a seller's market, consumers face a lot of problems related to quality, quantity, product range and price of the goods available. Kaur (2005) reported that majority of respondents (45.6%) faced the problem of food adulteration, short weighing/measuring (42.0%) and overpricing (34.8%) while purchasing food items (grocery and processed food items).

To increase the profit margin, sellers adopt several fraudulent practices on account of which ultimately consumer has to suffer. They generally get less than they are entitled to, for the money they spend. Buyers would have a weak bargaining power; not only this, they also do not assert their rights of being heard. As a result, traders are tempted to follow diverse practices which turn out to be unfair to the consumers.

Consumer is left to the mercy of manufacturer and salesman, who is playing with his health, as number of food stuffs in the market are adulterated. Rana and Sangwan (1998) revealed through their study that adulterated/substandard goods followed by high prices and overcharging were the common problems experienced by respondents while purchasing food items.

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The consumers like to get maximum quantity for as low a price as possible. When the cost of the food production is higher than the cost which the consumer is prepared to pay, seller is compelled to supply a food product which is of inferior quality, and thus adulteration occurs. Adulteration has become a small-scale industry in India. Therefore, this study was undertaken with the following objectives:

1. To determine the level of awareness regarding fraudulent practices in food items amongst urban respondents, action taken by them, type of action and reasons for not taking action against these fraudulent practices.

2. To test the samples of food items for detection of adulteration.

METHODOLOGY

To meet the objectives, study was conducted in Ludhiana city under two phases viz. Phase I (field survey) and phase II (laboratory experiments). As per the information obtained from Municipal Corporation, Ludhiana city has been divided into four zones. Two localities from each zone were selected at random for better representation of Ludhiana city i.e. BRS nagar and Sarabha nagar from zone 1, PAU and Haibowal from zone 2, Jamalpur and Vishwakarma colony from zone 3 and from zone 4, Sunder nagar and Jodhewal basti were selected. From each of these selected localities 15 homemakers were selected and thus total sample comprised of 120 homemakers. Finalized interview schedule was used to collect the data. Direct personal interview method was adopted for data collection for phase 1. The data were collected during Nov 2006 to Jan 2007. Five shops were randomly selected from each locality and seven food items were taken as samples from each shop thus making total of 280 samples. On the basis of survey and relevant literature available, commonly used and most frequently adulterated food items were selected which included turmeric powder, chilli powder, coriander powder, black pepper (whole), common salt, honey and jaggery. Food samples were collected in small polythene bags tagged with paper slips designating area name. Different tests for different adulterants were performed according to the methods adopted by Kaur *et al.* (1997) and Sharma *et al.* (2003).

RESULTS AND DISCUSSION

Awareness of respondents regarding various fraudulent practices in food items

The data in Table 1 show awareness of respondents regarding various fraudulent practices prevalent in the market like adulteration, imitation, short weights and measures and high pricing which was seen to be very close in the range of 91.67 per cent to 94.17 per cent. Majority of the respondents (94.17%) were aware of adulteration followed by 92.50 per cent respondents who pointed out prevalence of imitated items in the market. Further it was observed from the results that 91.67 per cent respondents were aware of fraudulent practices like short weights and measures and high pricing. Comparatively lesser respondents were aware of misleading advertisements (64.17%), lack of standard marks on food items (50%) and 38.33 per cent respondents quoted problem of allurement through attractive packaging.

Action taken by the respondents against fraudulent practices in food items

Data in Table 2 unfolds information about action taken by respondents against fraudulent practices. Only 20.83 per cent respondents out of total number of respondents were seen to take action against fraudulent practices in food items. Majority of the respondents were taking action against fraudulent practices in case of dry food items with a mean score of 1.60 followed by processed food items (1.24) and fresh food items with mean score of 0.68. This can be attributed to the fact that dry and processed food items were purchased by them in bulk and they were getting bills after purchasing of these items.

Type of action taken by the respondents against fraudulent practices in food items

As the frequency of the malpractices in market is tremendous in amount and varied in nature. So, it is the duty of the consumer that they protect themselves against these malpractices. Data presented in Table 3 show type of action taken by respondents against fraudulent practices in food items. It is evident from the results that majority of the respondents (84%) reported to shopkeeper if they noticed any malpractice followed by 76 per cent respondents who stopped visiting and advised others not to buy any item from the particular shop which was doubtful for having sub-standard food products.

Table 1. Awareness of respondents regarding various fraudulent practices in food items

(N= 120)

Fradulen practices	Zone 1 n=30	Zone 2 n=30	Zone 3 n=30	Zone 4 n=30	Total
Adulteration	26 (86.67)	27 (90.00)	30 (100.00)	30 (100.00)	113 (94.17)
Imitation	25 (83.33)	28 (93.33)	29 (96.67)	29 (96.67)	111 (92.50)
Short weights and measures	26 (86.67)	27 (90.00)	27 (90.00)	30 (100.00)	110 (91.67)
High pricing	25 (83.33)	27 (90.00)	28 (93.33)	30 (100.00)	110 (91.67)
Sale of expired products	24 (80.00)	26 (86.67)	24 (80.00)	25 (83.33)	99 (82.50)
Misleading advertisements	23 (76.67)	23 (60.00)	17 (26.67)	14 (36.67)	77 (50.00)
Lack of standard marks	23 (76.67)	18 (60.00)	8 (26.67)	11 (36.67)	60 (50.00)
Allurement through attractive packaging	18 (60.00)	16 (53.33)	4 (13.33)	8 (26.67)	46 (38.33)

Figure in parentheses indicate the percentage values

Table 2. Action taken by the respondents against fraudulent practices in food items

(N= 25)

Type of food items	A	S	N	Mean Score
Fresh food items	5 (20.00)	7 (28.00)	13 (52.00)	0.68
Dry food items	15 (60.00)	10 (40.00)	-	1.60
Processed food	12 (48.00)	7 (28.00)	6 (24.00)	1.24

Figures in parentheses indicate the percentage values

Table 3. Type of action taken by respondents against fraudulent practices in food items

(N= 25)

Type of action	Number*	Percentage
Report of shopkeeper	21	84.00
Stop visiting and advise others not to buy from the particular shop	19	76.00
File a complaint in consumer court	5	20.00
Write to newspapers	3	12.00

*Multiple response

This can be attributed to the fact that respondents bought dry and processed food items from the fixed shop and it was easy for them to put up their complaints to the shopkeepers. Only 20 per cent respondents were those who lodged complaints in the consumer court against fraudulent practices. In addition, 12 per cent respondents wrote to newspaper for the general public awareness against malpractices adopted by sellers.

Reasons for not taking action by the respondents against fraudulent practices

The data in Table 4 indicate different reasons for not taking action by the respondents against fraudulent practices. It was seen that majority of the respondents were not taking action because it is a cumbersome procedure (68.42%). Further 34.74 per cent respondents were those who pointed out non-existence of consumer forum in vicinity as the main reason. Close proportion of respondents (31.58%) felt helpless for taking action on account of various reasons. This might be because consumers anticipated that nothing concrete would result even if they put efforts for it. In addition 27.37 per cent and 22.10 per cent respondents reported unawareness regarding consumer rights and unfamiliar with the procedure of lodging complaints respectively. The above findings revealed that taking action against fraud was long term procedure which involved a great deal of their time and effort and also problems were not solved immediately.

Adulteration in spices and common salt samples in different zones

The data presented in table 5 indicate adulteration in samples of spices. Turmeric powder was tested for the presence of metanil yellow and starch, chilli powder for brick powder, sand and grit in coriander samples, papaya seeds in black pepper and sand and grit in common salt. Determination of mentanil yellow revealed that as high as 30 per cent samples of turmeric powder in zone 2 contained metanil yellow while only 10 per cent samples from zone 1 showed its presence. Starch was also seen to be present in very few samples in all the zones with the exception of zone 4, where it was totally missing. Regarding chilli powder, 50-60 per cent samples were dertecetd to adulterated with brick powder. Results further indicate for the samples of coriander powder and whole black pepper, maximum of 80 per cent samples contained adulterants from zone 4 while the least i.e. 40 per cent samples in zone 2. In case of salt, it was found that most of the samples were found to be free of sand and grit.

Adulteration of jaggery and honey samples in different zones

Data in Table 6 reveal adulteration in jaggery and honey samples collected from 4 different zones. Jaggery was tested for the presence of metanil yellow, whereas honey was tested for invert sugar. It was seen that maximum samples of jaggery contained metanil yellow. It was as high as high 80 per cent of the samples in zone 1 to as low as 60 per cent in zone 3 and zone 4 each. The results point out that 70 per cent honey samples were found to contain invert sugar in zone 4 while the least sample i.e. 30 per cent of honey samples were positive for the presence of invert sugar in zone 3.

Table 4. Reasons for not taking action

(N= 25)

Reasons	Number*	Percentage
Long cumbersome procedure	65	68.42
Non-existence of consumer forum in vicinity	33	34.74
Feel helpless	30	31.58
Unaware of the consumer rights	26	27.37
Unfamiliar with the procedure of lodging complaints	21	22.10

* Multiple response

Table 5. Adulteration in spice sand common salt samples in different zones

(N= 10 shop per zone)

Zones	Spices					
	Turmeric powder		Chilli powder	Coriander powder	Black pepper	Common slat
	Metanil yellow	Starch	Brick powder	Sand and grit	Papaya seed	Sand and grit
Zone 1	1 (10.00)	2 (20.00)	5 (50.00)	6 (60.00)	6 (60.00)	1 (10.00)
Zone 2	3 (30.00)	1 (10.00)	5 (50.00)	4 (40.00)	4 (40.00)	2 (20.00)
Zone 3	2 (20.00)	2 (20.00)	6 (60.00)	6 (60.00)	5 (50.00)	- ()
Zone 4	2 (20.00)	-	5 (50.00)	8 (80.00)	8 (80.00)	1 (10.00)

Table 6. Adulteration in Jaggey and Honey sampls in different zone

(N= 10 shop per zone)

Zones	Jaggery	Honey
	Metanil yellow	Invert sugar
Zone 1	8 (80.00)	4 (40.00)
Zone 2	7 (70.00)	5 (50.00)
Zone 3	6 (60.00)	3 (30.00)
Zone 4	6 (60.00)	7 (70.00)

CONCLUSIONS

Most of the homemakers were aware of fraudulent practices such as adulteration, duplication, short weights and measures and high pricing. Mostly action was taken for dry food items followed by processed and fresh food items. Majority of the respondents reported to shopkeeper in case they found any problem followed by the respondents who stopped visiting that shop and advised others not to purchase any food items from that particular shop. Majority of the respondents were not taking action because taking action was a long cumbersome procedure. Mostly adulterated food items were chilli powder, coriander powder and black pepper (whole), jaggery and honey.

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Structure and Growth of Television : Focus on Farm Telecast

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ABSTRACT

A study was conducted to asses the structure and growth of television in rural Rajasthan with special focus on farm telecast. Secondary data were collected from the Doordarshan officials. Television coverage of the population had grown from 39 per cent in 1987 to 78 per cent in 2002. Duration of farm telecast decreased from 150 minutes/week in 1987 to 64 minutes/week in 2002. Among education and development programmes telecast, number of agricultural programmes decreased from 60 per cent in 1993 to 41 per cet in 2002.

The role of television has been conceptualized as an important and powerful medium for informing, educating, entertaining and influencing the masses. It plays an important role especially at the awareness and interest stages of adoption process. It has become the most popular, glamorous and acclaimed medium of communication. Message through television can motivate, stimulate, induce and change attitude of the people.

The role of mass media as an instrument for social, cultural and economic changes is much more vital today than ever before.

The present age has been rightly termed as an "information age". People want adequate and authentic information as early as possible. The mass media, namely, newspaper, radio and television try to satisfy this important need of the people. Television, is the most exciting means of communication ever deviced by man.

Saksena (1998) observed that television has brought about two useful contributions to the nation, firstly, those living in remote corners of the country have been pulled out of their 'pockets of isolation' and merged into the nations mainstream and second it has provided a 'window' on the social and cultural scene in other parts of the country and beyond. Kashem and Hossain (2000) concluded that almost half (46 %) of the TV viewing farmers opined that television, as an agricultural information medium was highly useful for receiving agricultural innovations. This implies that television is playing a significant role in the rural areas in diffusing technical information on various aspects of agriculture. Extension researches conducted in India have revealed a discriminative rural response structure towards farm television programmes.

Salzman (1993) pointed out that television play important role in the modernizing processes of rural life *i.e.* democratization, consumerism, urban modelling and linguistic hegemony that are presently widespread and each has major ramifications for cultural life locally and beyond, and they all deserve close and detailed attention by anyone trying to understand contemporary life. Johnson (2000) maintained that television is influencing the economic, social and political landscape, and relationships of village life.

Indian television has grown into one of the largest networks in the world. Doordarshan has now 21 channels, 16 regional centers, 26 local centers, 56 programme production centers, 1314 transmitters and 20 satellite transponders. It covers 77.5 per cent of area and 89.9 per cent of the population. The number of TV households is estimated to be 79.3 million, most of these are in metropolitan cities and towns.

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This study aimed at studying the structure and growth of television in rural Rajasthan with special focus on farm telecast.

METHODOLOGY

Secondary data since inception of television and personal consultation with the Doordarshan officials gave insight for the study. The growth per cent was calculated by using the following procedure.

$$\text{Growth per cent} = \frac{\text{Difference between two successive years data}}{\text{Data of previous year}} \times 100$$

RESULTS AND DISCUSSION

Area and population

Television has registered the most sudden and spectacular growth among mass media in the state but only in the past five to eight years, television has become widely accessible to most of the villagers in Rajasthan.

The data in the Table 1 clearly show that the last decade of the 20th century had recorded a tremendous growth of television in Rajasthan covering an area of 71.3 per cent in 2002 which was only 25.8 in 1990 and the population of 78.1 per cent in 2002 which was earlier 41.2 per cent in 1990. This is a positive trend and a lot of impact of TV can be expected because of this growth. The highest growth per cent was recorded in both coverage area as well as population between the years 1990 and 1993 in the state.

Growth of transmitters

The data in the Table 2 show the growth of television transmitters in Rajasthan. It took 10 years to establish 12 transmitters in the state (1977-1987). The growth of transmitters was phenomenal and reached an all time high of 100 in the year 2002. This shows that the state was really committed to benefit maximum people with respect to information dissemination.

Television households

Table 3 depicts the growth of television households in both rural and urban area of Rajasthan. The table clearly indicates that in rural area, the number of television households has increased at a constant rate of 7.00 per cent in every 3 years whereas in case of urban households the growth per cent has dropped constantly. The growth per cent was dropped in urban areas because of attainment of the saturation level. Table also indicates that there was a tremendous growth in television households which more than doubled in last half decade.

Duration of transmission

Table 4 indicates the decreasing trend of percentage time devoted to different farm telecasts under Jaipur Doordarshan Kendra. The Table reveals that the maximum time i.e. 71.42 per cent (150 minutes out of 210 minutes/per week) was devoted for farm telecast in the year 1987. Since then the total percentage has decreased from 16.78 per cent in 1993, 14.28 per cent in 1996, 8.52 per cent in 1999 which was only 5.80 per cent in the year 2002.

Programme composition

Table 5 indicates that Doordarshan Kendra, Jaipur used to telecast maximum programmes i.e. 71.42 per cent on education and development followed by informative (15.17 per cent) and entertainment programmes (13.41 per cent) in 1987. As time passed, the pattern changed. In 2002 there were maximum telecasts on entertainment programmes (44.17 per cent) and minimum 14.30 per cent on education and development programmes. There was a phenomenal increase in the telecast from 15.17 to 41.53 per cent for informative programmes during the same year.

Government television's purpose since the inception of television was first to educate, then to inform, and last to entertain the people. At the time of its inception the television in Rajasthan had the main focus of regional programmes on education and development programmes followed by informative and entertainment programmes, respectively. Trends have, however, reversed now. Education and development has taken a back seat whereas information and entertainment are still dominating.

So far as agricultural programmes were concerned, among all the education & development programmes telecast under Doordarshan Kendra Jaipur, that maximum number of telecasts i.e. 59.78 per cent were on agriculture in 1993 followed by 58.39 and 50.17 per cent in 1996 and 1999, respectively which had decreased upto 40.50 per cent in 2002 (Table 6). This, however, is not a positive trend.

The decrease could be due to the fact that many more programmes were non-agricultural in nature and got the higher priority. The number of private and government sponsored programme development companies were increased in order to fill the vacuum provided by the increase in the number of cable networks.

Table 5. Composition of different telecasts under Doordarshan Kendra, Jaipur

(in minutes)

S.No.	Year	Programme category			
		Informative	Education and Development	Entertainment	Total
1.	1987	1661 (15.17)	7820 (71.42)	1469 (13.41)	10950 (100)
2.	1993	17292 (46.40)	10463 (28.08)	9506 (25.52)	37261 (100)
3.	1996	15740 (36.04)	10685 (24.46)	17255 (39.50)	43680 (100)
4.	1999	20218 (39.59)	8683 (17.00)	22174 (43.41)	51075 (100)
5.	2002	23801 (41.53)	8197 (14.30)	25308 (44.17)	57306 (100)

Table 6. Composition of various educational and developmental programmes under Doordarshan Kendra, Jaipur

(in minutes)

S.No.	Programmes	Year			
		1993	1996	1999	2002
1.	Quiz/Brain storming	212 (2.03)	299 (2.80)	1067 (12.29)	1125 (13.72)
2.	Children Programme	1069 (10.22)	897 (8.39)	518 (5.96)	628 (7.66)
3.	Women's Programme	1075 (10.27)	1040 (9.73)	1074 (12.36)	737 (8.99)
4.	Rural (Agriculture)	6255 (59.78)	6239 (58.39)	4356 (50.17)	3320 (40.50)
5.	Youth programme	891 (8.52)	938 (8.78)	232 (2.68)	491 (5.99)
6.	Industrial workers	-	267 (2.50)	-	-
7.	Adult Education	-	-	47 (0.54)	162 (1.98)
8.	Health and Family Welfare	961 (9.81)	1005 (9.41)	1389 (16.00)	1734 (21.16)
	Total	10463 (100)	10685 (100)	8683 (100)	8197 (100)

The value in parentheses indicates percentage

Executives were also turning to data obtained from audience researchers, which showed that the entertainment fare was the most popular and doordarshan had to compete with other satellite networks which were primarily entertainment based.

Growth of farm telecast

People of Rajasthan got the opportunity to watch the first television programme i.e. 'Chaupal', with the advent of Satellite Instructional Television Experiment on 1st August, 1975. Primarily three districts of Rajasthan namely Jaipur, Sawai Madhopur and Kota were included in this experiment. Till 31st July, 1976 the programmes were beamed with the help of American satellite ATS-6. Direct receiving sets were provided to 388 selected villages and people of these villages watched the programmes produced in Delhi based studios.

Keeping in view the success of SITE experiment, one Upgrah Doordarshan Kendra was established in Delhi on 1st March 1977, where programmes were produced for relay from HPTs located at Jaipur, Raipur and Muzaffarpur. Later on, in June 1987 a full-fledged Doordarshan Kendra was established in Jaipur and all the staffs working in Upgrah Doordarshan Kendra, Delhi were transferred to Jaipur. Initially DDK, Jaipur started telecasting programmes for a duration of 30 minutes only. Later on total transmission of regional programmes ranged between 30 minutes and 2 hours 30 minutes per day. Transmission hours of regional programmes have further increased from time to time.

The power of transmitter located in Jaipur is 10 kw, it's service area is 130 km. Jaipur, along with parts of Tonk, Sawai Madhopur, Alwar, Sikar, Jhunjhunu, Nagaur and Ajmer districts were covered by transmitters at Jaipur. Now various type of programmes were being produced at the Kendra which were becoming increasingly popular among viewers. The programmes were also encouraging local talent by giving them a chance to perform. In the beginning the Kendra was having only one studio set up. The second studio was commissioned in December, 1992.

On Dec. 11, 1993 the Kendra introduced commercial service also. The Kendra had started regional language satellite channel for the duration of one year (March 2000 to April, 2001). A website (www.ddjaipur.com) of the Kendra was developed in-house and all relevant information about the Kendra was made available on it for the benefit of viewers and the clients.

In June 1994 various sub-programmes under 'chaupal' programmes were telecast like Sanwala Re Chaupal, Mahila Chaupal and Sugandh Mati Ree and Gramin Jagat.

In Setpember, 1998 the first out-house farm telecast 'Ankur' was produced and sponsored by the State Department of Agriculture. It was a 25 minutes programme and telecast twice a month. A new in-house farm telecast 'krishi Jagat' with the duration of 18 minutes, twice a week was also started from August, 2000. At the same time, the number of 'chaupal' programmes were reduced from 5 days/week to 2 days/per week with the duration of 18 minutes/day.

Later on, the 'Krishi Jagat' was closed in October, 2002 and a new out-house programme called 'Gramin Bharat' was introduced. This was sponsored by the Ministry of Rural Development, Govt. of India for 2 days/ week with the duration of 15 minutes. At the same time the duration for chaupal got reduced duration from 18 minutes to 13 minutes per day.

CONCLUSION

The last decade of the 20th century had recorded a tremendous growth of television in Rajasthan covering an area of 71.3 per cent in 2002, which was only 25.8 per cent in 1990, and the population of 78.1 per cent in 2002, which was earlier 41.2 per cent in 1990. This is a positive trend and a lot of impact of TV can be expected because of this growth.

It initially establishment of slow but transmitters in the state growth was transmitters was phenomenal and after that reached an all time high of 100 in year 2002.

In rural area of Rajasthan growth rate of acquiring TV set was found to be more in comparison to urban arcas of Rajasthan as the latter got saturated. Extent of time given to farm telecasts in decreasing science 1987 and was found to be only 5.8% in 2002 and informative programmes have given way to entertainment programmes.

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Evaluation of Course Contents of Mushroom CultivationTraining Programme

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ABSTRACT

The study was conducted to evaluate the course contents of the National Training Course on Mushroom Production Technology for farmers, farm women and unemployed youths with a view to make improvement in the training programme. The selected trainees were given one week training on cultivation technology of various types of mushrooms. The subject matter taught during the training was evaluated at the end. The results reveal that majority of the lectures (72.58%) and practicals (67.74%) were of high level usefulness and the rest were of medium level usefulness. None of the lecture belonged to low level of usefulness.

Training is essential to an individual to pace with the changes and challenges occurring due to advancement in technology over a period of time. Training makes an individual proficient in his job by providing an opportunity to acquire new skills and knowledge. According to Paul *et al.* (1989) training refers to the process of developing or augmenting knowledge, skills and attitudes in the person to be applied to the performance of his or her specific work situation. Whenever an individual wants to shift his/her profession or intends to adopt new advance technology, then he needs to be trained in that new profession or advance technology. Mushroom being a quite new non-traditional indoor vegetable crop, its cultivation technique is unique and entirely different from traditional vegetable crops, and can only be taken up by an individual after proper training. Hence, training is an integral part of mushroom cultivation.

Among the several factors contributing towards progress of mushroom cultivation enterprise, the quality of training elements viz; the trainer's capability, training methods, use of audio-visual aids, facilities at the training centre, course contents, supporting training material and the trainees is also very crucial.

The evaluation of course contents of training programme is very much essential to make the training effective to meet the needs of the farmers. The National Research Centre for Mushroom, Solan, has been organising training programmes on mushroom cultivation for the farmers since 1995. During the last six years, the course contents of this training programme has been changed based on coordinator's perception, but the systematic evaluation of the course content has not been conducted so far. Hence, the present study was conducted to evaluate the course contents of the National Training Course on Mushroom Production Technology for marginal and small farmers, farm women and unemployed youths held at the National Research Centre for Mushroom,Solan(H.P.) in the year 2001.

METHODOLOGY

This training programme of National Research Centre for Mushroom has been designed to cater the needs of the trainees from all over the country. Keeping in mind the diversified climate of the country, six types of mushroom namely, white button mushroom (*Agaricus bisporus)*, summer white button mushroom *(A.bitorquis)*, oyster mushroom (*Pleurotus* spp.), paddy straw mushroom (*Volvariella* spp.), black ear mushroom (*Auricularia* spp.) and milky white mushroom (*Calocybe indica*) were included in the training. The participants of the training programme were from13 states of India. A total number

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of 71 farmers, farm women and unemployed youths were selected from 13 states on first come first serve basis over a period of one year .The maximum trainees were from Himachal Pradesh (39),followed by Rajasthan (9), Haryana (5), Uttar Pradesh (4), Madhya Pradesh (3), Punjab (2), Gujarat (2), Bihar (2), Maharashtra (1), Uttaranchal (1), J&K (1), Chhatisgarh (1) and West Bengal (1). The southern part of the country was unrepresented because of the Hindi medium of instruction.

A total number of 62 participants constituted the sample as remaining trainees were unable to respond properly. These selected trainees had under gone one week training on mushrooms cultivation through lectures and practicals. Trainees' opinion on usefulness of 20 lectures and 10 practicals taught/conducted during the training programmes were sought after the completion of theprogramme. The usefulness of each lecture and practical was measured on three point continuum as most useful, useful, least useful with respective scores as 3,2 and 1. Trainees were asked to rate each lecture and practical in any one category as per their perception.

RESULTS AND DISCUSSION

Extent of usefulness of lectures and practicals as perceived by trainees

The usefulness of 20 lectures and 10 practicals was measured on three point continuum and the data obtained were analysed' using statistical devices like frequency, percentage and ranks. The results have been presented in Table 1 and 2.

The data in Table 1 reveal that majority of the lectures delivered during the training were perceived as very useful. The cummulative usefulness index score based rank value describes place of each lecture in terms of usefulness. The CUI scores of eighteen lectures out of twenty, was found to be above 200 which indicate that these lectures are very useful. None of the lecture was found least useful. The lectures viz, 'importance of mushroom cultivation in India', 'compost preparation for white button mushroom using short method', 'insect, pest and nematodes of mushrooms and their management' as well as 'round the year seasonal cultivation of mushrooms', 'post harvest handling', and 'management of diseases of mushrooms' were ranked Ist, IInd, IIIrd and Vth, respectively indicating that these lectures were highly useful. Other most useful lectures were: 'preparation of spawn', 'cultivation of *Pleurotus* spp.', 'crop management practices for white button mushroom', 'mushroom farm design suiting to Indian conditions', 'compost preparation by long method', 'annual calender for seasonal cultivation of dhingri mushroom', 'characteristics of different varieties', 'economics of white button mushroom cultivation', 'use of spent compost', 'application of hormones/biofertilizers', 'economics of oyster mushroom cultivation', and 'cultivation package of summer white button mushroom'.

The data in Table-2 reveal that the practical exercise on 'identification of diseases, insects and pests of mushrooms' was highly useful followed by 'method of spawn production', 'visit of the Centre's farm design' and 'various methods of compost preparation'.

Table further reveal that the practicals on white button and oyster mushrooms cultivation were given utmost importance and vice versa in case of other uncommon mushrooms like paddy straw and specialty mushrooms.

Overall usefulness of course content of farmer's training programme

After knowing the usefulness of individual lecture and practical, it is essential to determine the overall usefulness of course contents with respect to lectures and practicals. For this purpose, the over all score of each respondent for lectures and practicals was worked out and the results are presented in Table 3 and 4.

The data in Table 3 reveal that majority of the lectures (72.58%) belonged to high level of usefulness and the remaining 27.42 percent lectures were in medium level. It indicates that nearly 3/4 of the course contents were perceived as highly useful whereas rest 1/4 course contents were of medium usefulness.

Data presented in Table 4 show that majority of the practicals (67.74%) were found highly useful, while only 30.65 percent practicals were of medium level of usefulness.

Suggestions for improving the course contents and training programme

Apart from evaluation of course contents, the suggestions were also invited to make improvement in the course contents and training programme. On this aspect, only 58 trainees responded and a total number of 19 suggestions were given by them. Out of 19, only 11 suggestions were supported by more than one trainee.

The data presented in Table 5 reveal that need for increasing the number of practicals was most important

Table 1. Perceived usefulness of lectures delivered during farmers training

S. No.	Lectures delivered	Very useful	Useful	Least useful	CUI value	Ranks
1.	Importance of mushroom cultivation in India	80.65(50)	17.75(11)	1.60 (1)	279.05	I
2.	Preparation of spawn, its storage and transportation	72.58(45)	17.75(11)	9.67(6)	262.91	VII
3.	Compost preparation for white button mushroom by long method	61.29(38)	27.42(17)	11.29(7)	250.00	XI
4.	Compost preparation for white button mushroom by short method	79.00(49)	12.94(8)	8.06(5)	270.86	II
5.	Mushroom farm design suiting to Indian conditions	62.90(39)	32.26(20)	4.84(3)	258.06	X
6.	Crop management and improved practices for white button mushroom cultivation	64.52(40)	30.64(19)	4.84(3)	259.68	IX
7.	Cultivation package of summer white button mushroom	38.71(24)	38.71(24)	22.58(14)	216.13	XVIII
8.	Cultivation technology of *Pleurotus* spp.	62.90(39)	35.48(22)	1.60 (1)	261.26	VIII
9.	Economics of white button mushroom cultivation	50.00(31)	40.32(25)	9.67(6)	240.31	XIV
10.	Economics of oyster mushroom cultivation	37.10(23)	51.61(32)	11.29(7)	225.81	XVII
11.	Cultivation package of specialty mushrooms	22.58(14)	56.45(35)	20.97(13)	201.61	XIX
12.	Cultivation technology package of paddy straw mushroom	22.58(14)	37.10(23)	40.32(25)	182.26	XX
13.	Diseases of mushrooms and their management	74.19(46)	17.75(11)	8.06(5)	266.13	V
14.	Insects, pests and nematodes of mushrooms and their management	74.19(46)	20.97(13)	4.84(3)	269.35	III
15.	Post harvest handling and processing of mushroom	72.58(45)	20.97(13)	6.45(4)	266.13	V
16.	Characteristics of different varieties/strains of mushrooms	53.23(33)	38.71(24)	8.06(5)	245.17	XIII
17.	Round the year seasonal cultivation of mushrooms	72.58(45)	24.19(15)	3.23(2)	269.35	III
18.	Uses of spent compost for various purposes	50.00(31)	38.71(24)	11.29(7)	238.71	XV
19.	Application of hormones and biofertilizers for yield enhancement	38.71(24)	50.00(31)	11.29(7)	227.42	XVI
20.	Annual calender for seasonal cultivation of Dhingri mushroom	51.61(32)	43.55(27)	4.84(3)	246.77	XII

Figures in parenthesis indicate number.
*CUI value ranged from 100 to 300.

Table 2. Perceived usefulness of practicals conducted during farmers training

S. No.	Lectures delivered	Very useful	Useful	Least useful	CUI value	Ranks
1.	Identification of diseases, insects and pests of mushrooms	82.25(51)	14.52(9)	3.23(2)	279.02	I
2.	Method of.spawn production	79.03(49)	17.74(11)	3.23(2)	275.80	II
3.	Visit of the centres farm design	69.35(43)	29.04(18)	1.61(1)	267.74	III
4.	Various methods of compost preparation for white button mushroom	69.35(43)	25.81(16)	4.84(3)	264.51	IV
5.	Improved package of practices and crop management	64.52(40)	30.64(19)	4.84(3)	259.68	V
6.	Methods of oyster mushroom cultivation	59.68(37)	32.26(20)	8.06(5)	251.61	VI
7.	Post harvest handling and preservation of mushrooms	56.46(35)	35.48(22)	8.06(5)	248.38	VII
8..	Farm visit of local mushroom units	45.16(28)	40.35(25)	14.52(9)	230.64	VIII
9.	Method of paddy straw mushroom cultivation	29.04(18)	37.09(23)	33.87(21)	195.17	IX
10.	Method of specialty mushroom cultivation	25.81(16)	43.55(27)	30.64(19)	195.17	IX

Figures in parenthesis indicate numbers.
*CUI value ranged from 100 to 300.

Table 3. Overall usefulness of farmer's training course content with respect to lectures

Category	Usefulness score	Frequency	Percentage
Low level	20-32	00	00.00
Medium level	33-46	17	27.42
High level	47-60	45	72.58

*Range of usefulness score 20-60

Table-4: Overall usefulness of farmers training course contents with respect to practicals

Category	Usefulness score	Frequency	Percentage
Low level	10-16	01	01.61
Medium level	17-28	19	30.65
High level	24-30	42	67.74

*Range of usefulness score 20-60

suggestion endorsed by 39.65 per cent trainees. The need for increase in duration of training programme was the second most important suggestion. The third important suggestion was concerning the medium of instruction in Hindi which was followed by 'practicals by trainees with their own hands', 'low cost farm design suitable for small scale production', 'small and homogenous group of trainees', 'more emphasis on diseases and insects aspects', 'mixed medium of teaching (Hindi and English)', 'practical class immediately after lecture', 'emphasis on practical knowledge of mushroom cultivation instead of bookish one', and 'supply of training notes in the starting of the programme'.

CONCLUSION

All the lectures and practicals taught during the training were perceived as very useful and useful. None of the lecture and practical was found useless except low importance to few lectures and practicals on paddy straw and specialty mushrooms. On the basis of these findings it may be concluded that the course contents of training programme is very much meaningful and as per the requirements of the trainees. However, there are always chances of improvement due to technological advancement.So, the present training programme may be redesigned and modified keeping in mind the suggestions given by trainees to make it more and more effective, and compatible with training needs of the trainees.

Table 5. Suggestions for improving the course contents and training programme

S. No.	Suggestion	No.	Percentage	Rank
1.	Provide training notes in starting of the programme	2	3.45	XI
2.	Mixed medium of teaching (Hindi & English)	4	6.89	VIII
3.	Teaching in Hindi	15	25.86	III
4.	Greater emphasis on low cost farm design suitable for small scale production	9	15.52	V
5.	Increase in training duration	19	32.76	II
6.	Small and homogenous batch	5	8.62	VI
7.	Practicals by trainee's own hand	10	17.24	IV
8.	More emphasis on disease and insects aspects	5	8.62	VI
9.	More number of practicals	23	39.65	I
10.	Practical class immediately after lecture class	3	5.17	IX
11.	Emphasis on Practical knowledge of mushroom cultivation instead of bookish one.	3	5.17	IX

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Research Note

Prevalent Food Myths Among Farm Women of Punjab

Rukhsana[1], Manjit Kaur[2]

Several studies in past have been done on what people eat, how much they should eat and the amount of nutrient needed by our body, but we don't know why people choose a certain type of food and sometimes they don't like to choose a specific food. Many a times choice of food is influenced by our deep-rooted food myths, which are still persistent, even after many changes have taken place in food habits. Many protective and nutritious foods are avoided during crucial stages of life due to prevalent food myths. Since food myths may adversely affect the consumption of right kind of food, it is important to know which food myths are common among the rural community and what are the reasons of their prevalence.

Further, for better nutritional status of the family members, enough supply of food to household alone cannot serve the purpose. The practice of equitable distribution of food to all the family members has to be followed. In almost all the family food is cooked and distributed by the female head but she usually ignores her own food requirements and suffers the burden of food deficit. The present study was undertaken to determine the food myths and food distribution pattern being followed in the farm families so that the lacunae, if any can be taken care of by providing information input to the farm families.

METHODOLOGY

The study was conducted in two districts of Punjab viz. Ludhiana and Ferozepur. One village from each of the district was selected randomly. A proportionate random sample of 75 families was selected from 3 categories viz. marginal, small and large farm families from each selected village. One female member shouldering major household responsibilities between the age group of 25-45 years was selected from each family to comprise a total sample of 150 respondents for the present study. An interview schedule consisting of 11 statements related to the prevalent food myths as well as a list of some food items to know their nature as hot, cold and gas producing foods was used to study the food myths. In order to study the food distribution pattern, respondents were asked about to whom they give priority while distributing food to different family members.

RESULTS AND DISCUSSION

Majority of the respondents were in the age group of 25-32 years (42.00%), illiterate (45.33%), had joint families (57.33%), were vegetarian (51.33%) and belonged to small farm families (43.33%). The results on prevalence of food myths among rural women have been discussed below.

Prevalent Food Myths and their Reasons

Data in Table 1 represent the information with respect to prevalent myths about the foods, which were avoided or given in abundance during special conditions. Data reveals that majority of the respondents i.e. 73.33 per cent avoided milk after eating meat or fish because of the myth that it may cause skin diseases. About 70 per cent reported that they avoided taking water after eating groundnut as it leads to cough.

As far as myths during the pregnancy were concerned i.e. 68.67 per cent respondents held the belief that more fat should be given in the last months of the pregnancy. The reasons indicated were that it helps in easy delivery and it is good for the health of the mother and fotus.

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Table 1. Distribution of respondents according to prevalent food myths along with reasons

N=150

S. No	Food myths	Reasons	%
1	Curd or lassi should be avoided at night	Difficult to digest	17.33
2	Lassi causes headache	Heavy	8.67
3	Milk should be avoided after eating meat or fish	Causes skin diseases	73.33
4	Water should not be taken after eating groundnut	Causes cough	70.67
5	Banana should not be given to pregnant women	Not good	16.00
6	Pregnant women should avoid papaya	Causes abortion	19.33
7	Garlic should be given to lactating mothers	Increases milk secretion	30.67
8	Cumin seed should be given to lactating mothers	Increases milk secretion	44.67
9	More fat should be given in the last months of pregnancy	Easy delivery Good health	46.00
		of infant & mother	22.67
10	Colostrum should not be given to new born infant	Impure milk	50.66
		Tradition	26.00
11	Curd should not be given to infant	Causes allergy	14.00
		Cold food	8.00

Table 2. Distribution of respondents according to the myths related to the nature of food

(N=150)

Food items	Hot f (%)	Cold f (%)	Gas producing f (%)	Neutral f (%)
Rice	-	103(68.67)	-	47(31.33)
Wheat	-	92(61.33)	-	58(38.67)
Maize	113(75.33)	-	-	37(24.67)
Bengal gram	107(71.33)	-	-	43(28.67)
*Black gram	122(81.33)	-	38(25.33)	-
Green gram	-	98(65.33)	-	52(34.67)
Moth beans	109(72.67)	-	-	41(27.33)
*Curd/lassi	-	133(88.67)	40(26.69)	-
Radish	-	64(42.67)	-	86(57.33)
Cucumber	-	108(72.00)	-	42(28.00)
Onion	-	78(52.00)	-	72(48.00)
Mustard	-	-	34(22.67)	116(77.33)
Cauliflower	-	-	37(24.66)	113(75.33)
Meat	121(80.67)	-	-	29(19.33)
Eggs	116(77.33)	-	-	34(22.67)
Dry fruits	119(79.33)	-	-	31(20.67)

*Multiple responses

Respondents also had belief that papaya and banana should be avoided during pregnancy as it was considered as harmful to the health of the pregnant women. Between 30 to 45 per cent of the respondents held the myth that garlic and cumin seeds should be given to lactating mothers to increase the milk secretion. In general the foods which were considered as hot were avoided during pregnancy because of the myth that it might cause abortion, while cold food were avoided during lactation, however hot foods were given in abundance to increase the milk secretion of lactating mothers.

As far as infant feeding was concerned majority of the respondents did not feed colostrum to the newborn infant. About 51 per cent of respondents believed that the breast milk secreted during first few hours after delivery is impure and should not be given to the infant while 26.00 per cent discarded it because it was their traditional practice. About 22 per cent of the respondents did not feed curd to the infant because of the belief that it causes allergy (14.00%), while 8.00 per cent considered it as a cold food. As many as 17.33 per cent avoided curd and lassi at night as it was considered hard to digest and causes indigestion.

Food Myths Related to the Nature of Food

Data presented in Table 2 pertain to the findings related to the nature of food i.e. hot, cold and gas producing food as perceived by the respondents. The finding showed that more than half of the respondents considered rice (68.67%) and wheat (61.33%) as cold food, while majority of the respondents i.e. 75.33 per cent believed that maize is a hot food.

With regard to myths related to nature of pulses, almost 81 per cent and 73 per cent considered black gram and moth bean as hot food respectively, whereas green gram was believed to be a cold food by 65.33 per cent of the respondents. As many as 71.33 per cent respondents held the belief that bengal gram is hot food while 25.33 per cent considered it as a gas producing food. Majority of the respondents (88.67%) considered lassi as a cold food, while 26.67 per cent considered it as gas producing food.

With respect to the myths related to the nature of vegetables, 72 per cent and 52 per cent held the myth that cucumber and onion are cold foods respectively, while radish was considered as cold food by 42.67 per cent of respondents. Cauliflower and mustard (saag) were considered as gas producing foods by about 22 to 24 per cent of the respondents.

Majority of the respondents i.e. 80.66 per cent and 77.33 per cent considered meat and egg as hot food while dry fruits were considered as hot food by 79.33 per cent of respondents.

Priority given while distributing food among family members

Data presented in Table 3 contain information with respect to the family members who were given first preference in the distribution of food. In as many as 43.33 per cent families, priority was given to the husband/ male members while distributing food, followed by 27.33 per cent who gave priority to the sick/older person. Children were given priority by only 16.00 per cent of the families, while in none of the family the priority was given to the housewife/pregnant women while distributing food. Only 8.00 per cent of the families were those where all the family members were taking food at one time, while 5.33 per cent of the families did not follow any order of preference in the distribution of food.

Table 3. Distribution of families according to the priority given while distributing food among family members

(N=150)

Family member	MF (n_1-56) f(%)	SF (n_2-65) f(%)	LF (n_3-29) f(%)	Total f(%)	Rank
Husband	25 (44.64)	29 (44.62)	11 (37.93)	65 (43.33)	I
Sick/old person	18 (32.14)	17 (26.15)	6 (20.69)	41 (27.33)	II
Children	6 (10.71)	11 (16.92)	7 (24.14)	24 (16.00)	III
Housewife/ pregnant women	-	-	-	-	
All at one time	4 (7.14)	5 (7.69)	3 (10.34)	12 (8.00)	IV
No priority	3 (5.36)	3 (4.62)	2 (6.90)	8 (5.33)	V

CONCLUSION

The above findings revealed that the rural women held beliefs towards certain food items, thus there is a need to motivate the rural women to discontinue the practices of avoiding certain food items during special conditions or giving in abundant amount so as to avoid health complications. The findings also revealed that the pregnant/lactating women who are from the most vulnerable group did not receive any priority in the distribution of food. Thus a nutrition education programme should be organized in order to alter the pattern of food distribution amongst the family members so that the nutritional status of the family members as a whole can be taken care of.

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Research Note

Farmers' Wisdom in Insect-Pest Management

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The overwhelming majority of the population in most developing countries is small-scale farmers, each working less than two hectares of land. These farmers represent hundreds of distinct languages and ethnic groups. In most instances, the knowledge systems of these farmers have never been recorded systematically in written form; hence they are not easily accessible to agricultural researchers, extension workers, and development practitioners (Pimbert, 1991; Rajasekaran, 1993 and Warren *et al.*, 1995 and Singh, 2003a,b,c). While they remain invisible to the development community, many indigenous organizations are operating in rural communities to search for and identify solutions to community problems. Recent studies about indigenous knowledge in agriculture is having some efect; indeed it has changed the attitudes of policy makers and agricultural development planners in recent years, and this has led to renewed interst in this type of knowledge (Chambers *et al.*, 1989 and Sillitoe, 2001). Policy makers and agricultural development planners are beginning to recognize the need to understand existing knowledge systems and decision-making processes (Richards, 1989). Agricultural innovations based on indigenous knowledge have been tested over time. Indigenous knowledge is a science that is user derived and scientist-derived, and its utilization in development efforts provides long-term advantages that complement the contributions of conventional top-down agricltural technologies for which scientist and policy makers are beginning to recognize the need to understand existing knowledge system and decision making proces (Warren *et al.*, 1995; Kolawole, 2001 and Gorjestani, 2003). The Indian heritage of wisdom has always been a treasure for the West. Pest management experience of resource-poor farmers gathered over generations is so rich and practical. The criteria for growing healthy crop in older days were basically the same, but apparently no standrd procedures are existed (Bentley and Keith, 1996). Even more than two millennia later, the concept holds true and it will hold to as long human inhabits the earth.

Looking to the importance of indigenous knowledge and its role in maintaining the sustainability in agriculture, an attempt has been made to identify the tribal farmers' wisdom about their local know-how for management of rice based farming system and explore the scientific rationality with the help of group of Subject Matter Specialists and secondary references as well.

METHODOLOGY

The users of indigenous knowledge exclusively belonged to the resource-poor farmers from the middle and north-eastern part of the Rajasthan State of India. A farmer from the region having land more than the 20 acres was considered as poor because due to least productivity of farming systems. The annual income of the technology users varied from the Rs. 20,000 to Rs. 50,000. The basic occupation of the farmer was agriculture while livestock and poultry farming were exercised as subsidiary enterprise with a view to diversify the farming system for reducing the risk. Farmers served as labourers in urban areas and migrated during the off-season of crop. Hence, was difficult to these farmers to adopt the modern practices for the treatment of many plant diseases and pests due to high cost of modern practices and technologies.

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SRISTI of Indian Institute of Management, Ahmedabad and Tarun Bhart Sangh, an NGO of Bhikampura, village, Alwar district, Rajasthan state, organized a research journey (Sodhyatra) during the year 2001-2002 on foot. A heterogeneous group had many more objectives, beside to learn and understand the village-base socio-economic-life style, especially to the urban people. The State of Rajsthan is located in arid zone, with cultural and agricultural heritage and diversity. The group having about 120 members (12 to 75 years of age old) travelled on foot for about 150 km.

While travelling with the group, the author of this paper also recorded some interesting observations, pertaining to the low cost and no-cost technology of crop. During stay at places, group discussions were made with villagers comparatively wise person were selected and later a detailed discussions, observations and their experiences were recorded. The gathered information, after documentation was discussed to plant protection scientists at Jawaharlal Nehru Agriculture University, Jabalpur, Madhya Pradesh. Possible explanation on the efficacy of technology has been discussed.

RESULTS AND DISCUSSION

After the discussions with the wisemen following interesting results about the local technology for the pest management have been documented.

Management of *Kukra* Disease (Viral)

For the black cumin crop: Foliar application of decoction made from *teak* green leaves *(Tectonagrandis grandis)* was used at 10 days interval. Decoction was prepared by boiling the green leaves of *teak* (7.5 kg/ha) and sugar (5 kg/ha) in 25 litre of normal water. These materials were boiled till half of the solution was left and then after spread over the crops before the entry of the virus.

For the Chili crop: Pre-sowing soil application of dung of pig through mixing and later, burning of the dry dung around the filed. Followed by soil application of solution of dung (10-12 kg in 250-300 litre water/ha) applied manually.

Scientific comments

Kukra disease was a disease problem with the symptoms including rolling of leaves, reduction in size, and deformation of leaves. In chilies species of insect, white flies (*Bemaria tabaci*) are involved, which were also the vector of virus pathogens. The involvement of red spider mites and fungi (*Fusarium* sp.) had been noticed in various parts of the country wherever chilli crop was grown. The principle present in green leaves of *Teak*, or microbial population present in the pig-dung may be inhibitory to the vector, white fly and mites. The smoke and burning around the filed, destroy the alternate and collateral host of the vector and pathogen. The practices reduced the initial population of the disease-carrying agent. Soil application of the dung not only altered the soil microbial population but also provided the plants sufficiently to fight against the disease and insects.

Management of fruit boring insects in vegetable

Application of the fermented mixture of cow dung (5-6.5 kg/ha), cow urine (5-6.5 lit/ha) tobacco leaves (3-6 kg/ha) and belladonna (*Calotropis gingantia*) (7.5 kg/ha) leaves prepared in 10 litres of normal water was stored in metal or earthen pot for about 6 days. Prior to use, the mixture is filtered through clean cloth. The mixture had been reported to be very effective against fruit borer in ladyfinger, tomato and brinjal crops.

Foliar application of latex (milk) obtained wild cactus (1.2 lit/ha) mixed with 650 liter of water and subsequently soil drenched in the field of ladyfinger crop.

Foliar application of pre-soaked (12 hr) seed paste (3.75 kg/ha) of fenugreek and prepared in the 35 litres of normal water, incorporated with 5 liter of cow had been found effective in brinjal for the management of fruit borer with enhanced fruiting.

Foliar application of the mixture of chopped and powdered bark (2.5 kg/ha) of *Babool* (*Acasia nilotica*), jaggery (5 kg/ha) prepared in 25 litre of normal water, followed by soil drenching of the remaining solution in the field of tomato, brinjal, chilli and ladyfinger.

Scientific comment

The fruit borer, *Heliothis armigera* (the chickpea caterpillar) was the omni-virus and omni present insect. The fermented mixture of cow dung, urine belladonna leaves may have the anti-microbial property, non-preferable media. Latex (milk of wild cactus), cow milk or bark of *Accsia* may contain/provide unpalatable substrate with sticking property through jaggery; apart from the inhibitory substances (principle) against the fruit borer, thereby reducing the insect infestation and ultimate good yield. The efficacy of the mixture/solution had not been studied in scientific properties especially at bio-chemical level.

Prevention of orchard tree from surface termite infestation

1. Application of crushed, chopped and powdered green leaves of *Arusha* (*Adhatoda vasica*) to the soil and soil coverage with green leaves.

2. Placement of *Ghee* in the root zone and roots of saplings.

3. Chickpea seed treatment with pulp of banana and drying for over 12 hours prior to sowing.

4. Distribution of milk of *Ankda* (*Calotropis gingantia*) (750 ml.) through irrigation channel by dropping drop by drop in the wheat field.

Scientific comments

Surface termites were the major problem of light, dry soils affecting the plants. Preventing the contact between insect and plant through oil barrier is one way to reduce the loss. The aforesaid indigenous technology used the concept. In the moist conditions the activity of termite was reduced, hence the losses were also reduced. Integration of all the approaches saved the crop plant.

Perception of the farmers pertaining to the indigenous technology

The empirical data (Table 1) revealed that, majority (87.50%) of the people consented that, economic viability of indigenous practices is the most important indicator for its appropriateness. Each practice had logical rationality to cope with the diseases/problem and ranked at second position as reported by 85.00 per cent. While, no ill effect, efficacy and local availability were on third and fourth, important factors responsible for the appropriation.

Compatability with socio-economic conditions, past experiencs, unfailureness nature and compatible with cultural conditions were found to be most important indicators responsible for appropriateness of indigenous practices. Least important but non-avoidable factors for appropriateness of indigenous practices as reflected by poor people were noted as wide potential in the applicability, easy to handle and reproducibility under natural conditions.

Indigenous Aspects and sustainability of the practices

The indigenous background of the documented practices was that the resource-poor farmers used some plants from the wild areas and few of them had been domesticated from the wild areas and subsequently its importance was maintained in the present scenario. The knowledge for the optimal conditions for the growth and production of indigenous plants and materials as well as its relevance with the biotic and abiotic factors was only possessed by the local farmers, since time immemorial. The phenotypic characters and ecological knowledge of the local plants and practices used by local farmers were well known to them. People had developed certain kind of indicators for the identification of particular plants and related wisdom of collection used for controlling insect pests. The local farmers appreciated the uses of indigenous pest management practices by avoiding the introductionof exogenous practices for plant protection measures that were less adaptable to the harsh and risk prone agro-ecosystem. Some of the important plants were being identified and conserved in kitchen gardens and on-farm to maintain the environmental sustainability. Adopted indigenous practices were several times cheaper than modern methods in term of cost and effective to a particular problem.

Table 1 Perception of farmers regarding the factors responsible for appropriateness of indigenous practices for plant health

Indicators for appropriates	Percentage of response	Ranks
Economically viable	87.50	I
No adverse effect	81.25	III
Good Efficacy	81.25	III
Easy to handle	62.25	IX
Widely used	66.25	VIII
Locally available	77.50	IV
Rationality	85.00	II
Faith in quality	61.25	VIII
Unfailureness nature	73.75	VI
Compatible with socio-economic conditions	75.00	V
Compatible with past experiences	75.00	V
Compatible with cultural conditions	70.00	VII
Reproducibility nature	60.00	X

CONCLUSION

To combat the basic problems of plant health, location specific indigenous technologies were available. However, the complexicity of ecological and agro-climatological parameters the end results. The search of basic principle behind the concept needed to be justified on the scientific validity for its economical applications. Farmers informed wisdom must be traced out from the

grass-root, for promotion of eco-friendly viable technologies under risk prone conditions. Any type of technology had two dimensions that must be addressed before the technology would be comprehended and adopted by rural people, namely the socio-economic and the biophysical dimensions. Dissemination of the technology to other areas was then an additional challenge. Even under similar biophysical and socio-economic conditions, interdiscipinary teams and the farmers themselves had to work together to develop a sustainable technology. Expansion of knowledge on the complexity of indigenous agriculture system was essential to increase rational use of local knowledge in use of local technique. These reported indigenous pest management practices played a pivotal role in preserving many local land races and other natural resources under the rainfed and arid ecosystem of Rajasthan, and thereby provided ample opportunity to the agricultural scientists for source of hypothesis and validation of knowledge systems.

Promotion of micro-specific local management of indigenous crop management practices could provide an alternative model for resource conservation sustainable agriculture. Development, use and quantification of methods as well as indicators to monitor the extent of sustainability under indigenous farming system were the needed to decide the quantum contribution of local knowledge systems. Promotion of rewarding systems to the knowledge holders was the prime need to be taken into account for the equitable benefit share and conservation of knowledge systems.

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Research Note

An Assessment of Improved Vegetable Production Technologies

Neeraj Singh, Mathura Rai and B. Singh[1]

Eastern Uttar Pradesh is one of the major vegetable producing areas in the country. However, the productivity of this area is not upto the mark comparing to some other vegetable growing regions. There is also a large gap in the yield at farmers field and experimental fields. The regions of the state are endowed with diverse climatic zones and have great potential in the field of vegetable production. Since Front Line Demonstration of vegetable crops has been a neglected subject and no systematic work has been done at the farmers' fields, farmers are still practicing traditional methods of vegetable production, which require improvement trough adoption of high yielding varieties/hybrids and agro-techniques for assured returns.

Despite a large number of varieties/hybrids and agro-techniques have been developed, the productivity of vegetable crops has not touched the desired level. A good number of varieties/hybrids and agro-techniques have been developed and recommended through AICVIP, SAUs and other agro-agencies, but still very few of them have reached the actual growers. The concerned agencies are creating awareness about the benefits of improved vegetable production technologies and making efforts to disseminate varieties/technologies to increase vegetable production in eastern U.P. The IIVR being a pioneer institute in vegetable research, focused its effort in disseminating the recommended varieties/hybrids and agro-techniques in eastern Uttar Pradesh with following objectives :

- To assess the impact of disseminated vegetable technology at farmers' fields.
- To study the major constraints in vegetable production.

METHODOLOGY

The present study was conducted in five major vegetable growing districts of eastern Uttar Pradesh viz., Varanasi, Gazipur, Sonbhadra, Chandauli and Mirzapur. One organised group of 100 farmers from each district was formed representing the scenario of vegetables production of the district and efforts were made through Farmers' Meetings, Trainings and Front Line Demonstrations of vegetable technologies for quicker dissemination and adoption among selected farming community for two years *i.e.*, 2003-04 and 2004-05. A questionnaire was developed for collecting information regarding constraints in vegetable production that growers were facing.

RESULTS AND DISCUSSION

In the present study, twenty improved varieties of seven vegetable crops were demonstrated at farmers' field in an area of 180.48 acres (Table 1).

Performance of demonstrated vegetable varieties at farmers' fields

Tomato : Tomato was demonstrated in the fields of one hundred and ninty-two farmers of Varanasi, Gazipur, Sonbhadra, Chandauli and Mirzapur districts of eastern Uttar Pradesh. Earlier, the farmers of these area were growing their own seeds "Kajla" a local variety of tomato, which not only give them poor yield but also poor quality. Seeing the performance of DVRT-1, DVRT-2, H-86 and Sel-7 in their own fields the farmers not only adopted this variety of tomato but also some of them started producing seeds of DVRT-1 and Sel-7 at their own fields. The average yield of demonstrated varieties of tomato in the farmers' fields was recorded as 10 quintal per acre.

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Table 1. Vegetable crops and area under demonstration during 2003-04 and 2004-05

S.No.	Crops	Varieties	Districts under Demonstration	No. of Beneficiaries	Area (Acre)
1.	Tomato	DVRT-1, DVRT-2, H-86 and Sel-7	Varanasi, Sonbhadra Chandauli, Gazipur and Mirzapur	192	58.00
2.	Brinjal	BRSPS-14, IVBL-9 and Kashi Sandesh	Varanasi, Gazipur, Chandauli and Mirzapur	128	45.70
3.	Chilli	KA-2	Gazipur, Varanasi and Mirzapur	78	16.50
4.	Cowpea	IVRCP-2, IVRCP-3 and IVRCP-4	Varanasi, Chandauli and Mirzapur	68	34.25
5.	Sponge Gourd	IVSG-1	Varanasi and Mirzapur	21	03.25
6.	Radish	Japanese White	Chandauli	21	02.79
7.	Vegetable Pea	VRP-5, VRP-6, VRP-7 VRP-8, VRPMR-9 and VRPMR-10	Varanasi, Chandauli and Mirzapur	180	48.34
8.	Okra	VRO-5 and VRO-6	Varanasi, Sonbhadra, Chandauli, Gazipur and Mirzapur	206	48.15

Brinjal : A promising variety of brinjal "BRSPS-14", round type with purple colour was demonstrated in the farmers field of Arazilines, Harhaun, Badagaon, Sevapuri and Chiraigaon block of Varanasi district. In the market, demand for round purple brinjal is more and this variety proves a boon for brinjal growers. Apart from this variety IVBL-9 an open-pollinated variety and a hybrid Kashi Sandesh was also demonstrated in the farmers' field of Varanasi, Gazipur, Chanduli and Mirzapur districts of Uttar Pradesh. The farmers of these areas had harvested yield upto 200 quintal/acre from BRSPS-14 and IVBL-9 variety of brinjal, however, they had harvested an average yield of 310 quintal/acre in case of Kashi Sandesh.

Chilli : KA-2 variety of chilli was demonstrated in Gazipur, Varanasi and Mirzapur districts of Uttar Pradesh in an area of 16.50 acres. This variety of chilli became most popular in the area, since this is also suitable for the wheat growers who are taking wheat after chilli. Majority of the selected farmers started producing their own seeds of KA-2. The deep green quality of this variety is also fetching more prices in the market compared to other varieties.

Cowpea : Farmers of Varanasi and surrounding districts are growing pole type cowpea, which not only increases their cost of cultivation, but is also more labour intensive. In such situation, IIVR demonstrated a bushy type variety of cowpea VR-2, VR-3 and VR-4 in the field of sixty-eight farmers of Varanasi, Mirzapur and Chandauli district, which not only gave a good yield with better quality but also were less labour intensive. Farmers like Sh. Keshav Prasad of Kanchanpur, Sh. Phoolgan of Baghan and Sh. Arvind Kumar of Ramma also started multiplying seeds of these varieties of cowpea on a large scale.

Sponge Gourd : Sponge Gourd variety IVSG-1 developed by IIVR, Varanasi was den nstrated in 3.25 acres of farmers' field in Varanasi and Mirzapur districts. The farmers of these areas were satisfied with the performance in terms of quality and its average yield of 60-70 quintal per acre.

Radish : "Japanese White" a promising variety of radish with an average yield of 120-130 quintal per acre was demonstrated in the field of twenty-one farmers of Chandauli district. 10.80 kg of seeds was given to the farmers for demonstrations, the result of which gives a positive response by the growers.

Vegetable Pea : IIVR demonstrated its six promising varieties of vegetable pea *viz.*, VRP-5 and VRP-6 for early season crop and VRP-7 and VRP-8 for mid season crop, while VRPMR-9 and VRPMR-10 are powdery mildew resistant varieties. A total of eighteen-quintal seeds of these varieties of pea were put for demonstrations in 180 farmers' field with an area of 48.34 acres. All the varieties according to their characters performed well in the farmers' field of Varanasi, Chandauli, Mirzapur, Azamgarh and Bhadhoi district of eastern Uttar Pradesh. VRP-5 and VRP-6 an early season varieties produced an average yield of 75 quintal per acre and was early than Arkel and AP-3 varieties of pea. The demonstrations of pea this year resulted in heavy demand of seeds by the farmers.

Okra : VRO-5, a dwarf variety and VRO-6 a tall variety were the two promising varieties of okra demonstrated by the institute in a massive area of 48.15 acres in Varanasi, Gazipur, Sonbhadra, Chandauli and Mirzapur districts of Uttar Pradesh. In Chakia, VRO-6 variety of okra were demonstrated in a number of villages *viz.*, Bharauta, Bhikhapur, Garla, Ujridodapur, Mushaipur, Bhabhora, Tilawri, Derahu, Raghunathpur, Hatimpur, Musakhar, Muzaffarpur, Hemaiya, Premapur, Talra etc. where the farmers were so impressed with this variety that they started producing their own seeds. One of the farmers from Derahu village reported said that he had taken 24 picking of VRO-6 with an estimated yield of 100 q/acre.

Constraints in vegetable production and suggestion given by growers

The production of vegetable crops have become a specialised job, especially with the introduction of high yielding varieties and improved production and protection techniques. The constraints faced by the growers in vegetable production were studied by randomly selecting 300 respondents from the selected vegetable growers. Though a number of constraints were being faced by the vegetable growers like problem of electricity, protection of crops from animals etc., but the actual constraints which require immediate attention was unavailability of quality vegetable seeds, lack of technical knowledge, disease and pests management and proper market facilities (Table 2).

The suggestions to overcome the constraints in vegetable production were recorded from 300 vegetable growers (Table 3), which reflects that proper

Table 2. Constraints in vegetable production as perceived by growers

(N=300)

S.No.	Perceived Constraints	f	%	Rank
A.	**Bio-physical constraints**			
-	Natural Hazards	72	24.00	VIII
-	Wild Animals	242	80.67	I
-	Disease and pests incidence	172	57.34	III
-	Erratic power supply	130	43.34	VI
B.	**Technological constraints**			
-	Lack of technical knowledge	156	52.00	V
-	Unavailability of quality seeds	172	57.34	III
-	Labor scarcity	64	21.34	IX
-	Weeds problem	72	24.00	VIII
C.	**Marketing constraints**			
-	Transportation	64	21.34	IX
-	Storage	96	32.00	VII
-	Irregular market and market price	226	75.34	II
D.	**Economic constraints**			
-	High rate of hybrid seeds	156	52.00	V
-	High rate of pesticides	164	54.67	IV
-	High rate of fertilizers	130	43.34	VI
-	Lack of finance needed	54	18.00	X

Table 3. Suggestions given by vegetable growers to overcome the constraints

(N=300)

S.No.	Suggestions	f	%	Rank
1.	Timely technical guidance to growers	206	68.67	III
2.	Arrangements for easy availability of inputs like seeds, fertilizers, pesticides etc.	220	73.34	II
3.	Proper electricity for running tube well etc.	138	46.00	IV
4.	Storage facility near the market	102	34.00	V
5.	Market price shouild be controlled	230	76.67	I

arrangements for easy availability of inputs like seeds, fertilizers, pesticides etc. along with timely technical guidance to growers are the need of hour. More than 76 per cent of growers also responded that market price of vegetables should be controlled and for this computerized network of all the major vegetable markets in India may be done so that the farmers of particular area can get acquainted with the prices in other area.

CONCLUSION

Eastern Uttar Pradesh being the major vegetable producing region in the country is still having the low productivity compared to some other vegetable growing regions. Non-availability of quality seeds of improved crop varieties and protection techniques were the major limiting factor for low productivity. Though, a good number of varieties/hybrids and agro-techniques have been developed and recommended through AICRP (Vegetable Crops), but still very few of them have reached the actual growers. It is generally assumed that the best technologies in research station are also the best in farmers' fields. But the assumption of consistency or repeatability of technology performance between research station and farmers' field may not hold universally. Under such situation selection of best technologies for farmers can not be based solely on research station trials. Such a selection process should in fact be based on farm trials in which the new technology need to be compared to the farmers' existing practices under the growing conditions of their farms. Therefore, creating awareness about the benefits of advanced vegetable technologies to the farming community is considered as the most important activity in order to popularize varieties/technologies of vegetables in estern U.P. IIVR being a pioneer institute in vegetable research focused its effort in disseminating the recommended varieties/hybrids and agro-techniques in vegetables through farmers' meeting, demonstrations and training along with its impact on farming community. With the financial assistance provided by National Horticulture Board (NHB) and State Horticulture Department, recommended varieties of tomato, brinjal, cowpea, sponge gourd, radish, vegetable pea and okra along with improved production and protection technologies were demonstrated in farmers' field of Varanasi, Gazipur, Sonbhadra, Chandauli and Mirzapur districts in an area of 256.98 acres. Encouraged with the performance of different vegetable varieties and technologies in their own fields the farmers not only adopted these varieties and technologies but also started producing their own seeds of recommended vegetables varieties.

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Research Note

Reading Habits of Farmers

Hemlata Darurkar[1] and P.O. Ingle[2]

The use of print media is increasing considerably due to the increase in literacy. In India the literacy rate in 1980 was only 36 per cent but in 2002-2003 it increased up to 64.8 per cent, (male -70.2 per cent and female -48.3 per cent). In Maharashtra it is 76.8 per cent which indicates the increased use of print media by the farmers like farm magazines, newspapers, etc. These are important means to make available the research findings in the field of agriculture to the farming community.It should be inline with the reading habits of the farmers.

It is necessary to know the reading habits of rural readers so as to provide them proper guidance on selection and use of information. It is imperative that ineffective and time wasting reading habits should be changed to selective reading for agricultural purpose.It is necessary to improve the reading habits among farmers so as to make use of available literature to the fullest extent. Hence, the present study was planned with the specific objectives to study the reading habits of farmers.

METHODOLOGY

The present study was undertaken purposively in Akola Panchayat Samiti of Akola district of Vidarbha region of Maharashtra through exploratory design of social research. The study was conducted in 10 villages under from Akola Panchayat Samiti, viz., Nimbi, Kapshi, Chikhalgaon, Ugwa, Aagar, Palodi, Kanheri, Shivapur, Babulgaon and Wanirambhapur which were randomly selected using simple random sampling method. From each village a list of literate farmers who could read printed matter was obtained and 150 farmers were selected by equal interval random sampling technique in each village.

Reading habit was decided on the basis of subject matter read, place of reading, quality of reading and time spent on reading. Distribution of respondents according to reading habit was done at three levels viz., overall reading habit, reading habit about newspaper and reading habit about magazine.

RESULTS AND DISCUSSION

Majority of the respondents were found to be in medium level of overall reading habit (67.34 %). There was nearly equal distribution of respondents in high and low level of reading habit (17.33 % and 15.33 %), respectively (Table 1). Thus, it is concluded that relatively large proportion of respondents (67.34%) had moderate level of reading habit. The mean overall reading habit was found to be 17.11 per cent.

It was found that majority of the respondents had medium level of reading habit about newspaper (72.67 %) followed by 20.67 % who were in low level of reading habit. It was also found that a very few respondents (6.66 %) were having high level of reading habits about newspaper (Table 2). Mean reading habit about newspaper was found to be 49.96%. Most popular newspaper among the readers was 'Deshonnati' (Marathi journal)..

As regards reading habit about magazine, it was found that nearly equal proportion of respondents were found in both low and medium level of reading habit (32.00 % and 35.00 %) respectively while and 14.66 per cent respondents had high level of reading habit. It was revealed that asizable proportion of the respondents (40.67 %) never read magazines (Table 3).

Subject matter read

In case of newspaper (Table 4), it was found that 67.33 per cent of the respondents read complete newspaper and 19.33 per cent of the respondents read

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Table 1. Distribution of the respondents according to reading habit (overall)

(N =150)

S.No.	Reading habit	Respondents	
		Frequency	Percentage
1.	Low	23	15.33
2.	Medium	101	67.34
3.	High	26	17.33
	Total	**150**	**100.00**

Table 2. Distribution of the respondents according to reading habit about newspaper

(N=150)

S.No.	Reading habit about newspaper	Respondents	
		Frequency	Percentage
1.	Low	31	20.67
2.	Medium	109	72.67
3.	High	10	06.66
	Total	**150**	**100.00**

Table 3. Distribution of the respondents according to reading habit about magazine

(N=150)

S.No.	Reading habit about magazine	Respondents	
		Frequency	Percentage
1.	Low	2	21.33
2.	Medium	35	23.33
3.	High	22	14.66
4.	Never read	61	40.67
	Total	**150**	**100.00**

related information. It was also seen that those who read advertisements and news were at par i.e. 12 per cent. Only 6.67 per cent and 5.33 per cent respondents were found to read agricultural information and market information, respectively.

In case of magazines, it was observed that, 52.00 per cent farmers read agricultural information and only 1.3 per cent read complete magazine.

In case of leaflets, only 16.00 per cent respondents read agricultural information. Nearly similar findings were found in case of pamphlets (14.67 %), only 6 per cent and 2.00 per cent respondents read agricultural information from bulletin and other publication respectively.

Books and other reading materials were used for gaining agricultural information by a very small proportion of farmers (12.00 per cent).

Place of reading

In case of newspaper (Table 5), it is found that majority of the respondents read newspapers at their home (58.00 per cent) followed by equal distribution of respondents who read newspapers at neighbours home and village canteens (20.67 per cent). A very few respondents read newspapers at Gram Panchayat and rural library (7.33 per cent and 2.67 per cent) respectively. Further most of the respondents read newspaper at more than one place.

In case of magazine readers, relatively high proportion of the respondents read magazine at their home (43.82 per cent) followed by 28.08 per cent at rural library and Gram Panchayat (19.10 per cent) respectively. Very small proportion of respondents read magazine at their neighbour's house (8.98 per cent) while none of the respondents read magazine at village canteen.

In case of readers of leaflets and pamphlets cent per cent respondents read these publications at rural library. In case of bulletin, 81.81 per cent read at rural library, followed by 18.19 per cent respondents who read at their home.

In case of readers of books and other materials, 57.14 per cent respondents preferred rural library followed by 42.85 per cent respondents who read books and other publication at their home.

Time spent on reading

In case of bulletin readers (Table 6), majority of the respondents (90.90 %) preserved articles and used information given in it for farming. In case of readers of books and other publications, only 23.80 per cent respondents used information.

In case of newspaper readers, nearly half of the respondents (49.33 %) read newspaper for half an hour followed by 35.33 per cent respondents who read newspaper for one hour and very small proportion of respondent (15.33 %) read for 15 minutes.

In case of magazine readers, 84.26 per cent read it daily for half an hour followed by 12.35 per cent for one hour and 3.37 per cent for 15 min.

In case of reader of leaflets and pamphlets, cent per cent respondents devoted 15 minutes for reading.

Table 4. Distribution of the respondents according to subject matter read

(N=150)

S.No.	Subject matter read	Respondents											
		Newspaper		Magazine		Leaflets		Pamphlets		Bulletin		Other	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1.	Agricultural information	10	6.67	78	52.00	24	16.00	22	14.67	9	6.00	3	2.00
2.	Market information	8	5.33	22	14.67	2	1.33	0	0.00	0	0.00	0	0.00
3.	News	18	12.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
4.	Advertisement	18	12.00	18	12.00	2	133	0	0.00	0	0.00	0	0.00
5.	Other	29	19.33	31	40.67	5	3.33	7	4.67	2	1.33	18	12.00
6.	Whole publication	101	67.33	2	1.33	0	0.00	0	0.00	0	0.00	0	0.00

Table 5. Distribution of the respondents according to place of reading

(N=150)

S.No.	Place of reading	Respondents											
		n=150 Newspaper		n=89 Magazine		n=33 Leaflets		n=29 Pamphlets		n=11 Bulletin		n=21 Other	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1.	At home	87	58.00	39	43.82	0	0.00	0	0.00	2	18.18	9	42.85
2.	Neighbours home	31	20.67	8	8.98	0	0.00	0	0.00	0	0.00	0	0.00
3.	Rural library	4	2.67	25	28.08	33	100.0	29	100.00	9	81.81	12	57.14
4.	Gram panchayat	11	7.33	17	19.10	0	0.00	0	0.00	0	0.00	0	0.00
5.	Village canteens	31	20.67	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

Table 6. Distribution of respondents according to time spent on reading

(N=150)

S.No.	Publication	Respondents					
		1 hrs		30 hrs		15 min.	
		F	%	F	%	F	%
1.	Newspaper (n=150)	53	35.33	74	49.33	23	15.33
2.	Magazine (n=89)	11	12.35	75	84.26	3	3.37
3.	Leaflets (n=33)	0	0.00	0	0.00	33	100.00
4.	Pamphlets (n=29)	0	0.00	0	0.00	29	100.00
5.	Bulletins (n=11)	2	18.18	6	54.54	3	27.27
6.	Other (n=21)	14	66.66	7	33.33	0	0.00

In case of bulletin reader, more than half of the respondents (54.54 %) read bulletin for half an hour followed by 15 min (27.27 %) and 18.18 per cent for one hour.

Among readers of books and other publications, one third of the respondents (66.66 %) spent one hour for reading followed by 33.33 per cent respondents who spent 30 min. for reading them.

CONCLUSION

Majority of the farmers (67.34 %) were found in medium level of reading habit and equal distribution of farmers were found in low and high level of reading habit (15.33 % and 17.33 %) respectively. A large majority 78.00 per cent of the respondent were found to use magazine for agricultural information and only 6.00 per cent used bulletin for agricultural information. sizable proportion of respondent (67.33) read complete newspaper and 6.67 per cent read newspaper to get agricultural information. While 58.00 per cent of respondents read newspaper at their homes, 43.82 per cent of respondents read magazines at their homes. Only 18.18 per cent respondents read bulletin at their homes and 20.67 per cent farmers read newspapers at neighbours home. A small production of respondent (8.98%) read magazine at their neighbouirs home, 28.08 per cent respondents read magazine at rural library followed by Gram panchayat (19.00 %). Only 20.67 respondents were found to read newspaper at village canteen. Nearly half of the respondents were found to read newspaper for 30 min.

(49.33 %) followed by 35.30 per cent of respondents who read newspaper for one hour. Majority of the magazine reader respondents (84.26 %) spent 30 min. on reading followed by 54.54 per cent bulletin reader. Majority of respondents (90.99 %) used information given in bulletin followed by leaflet readers and pamphlets readers. Nearly half of the respondents (41.57 %) used information given in magazines followed by 26.00 per cent out respondents in case of of newspapers.

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Research Note

Economic Status and Decision Making Pattern among Tribal Women

Sheetal Badyal[1] and Rakesh Nanda[2]

Women constitute the backbone of Himalayan economic system, as the hill agriculture is absolutely dependent on them. Researchers reveal that women in hills generally work more than fifteen hours day (Bhandri, 1991), attending to agricultural system, cattle, collection of fuel, fodder and water in addition to normal duties at home. An attempt has been made here to see the status and role of women in a particular tribe through there inter-relations with men.

For this purpose, the *Gaddis* are not primitive but are isolated and at the same time experiencing a transitional phase. For that matter, no tribe is left as a real tribe and each one is at a different stage of development and Gaddi is of no exception to the concept. In Jammu & Kashmir State Gaddis constitute the semi-nomadic tribe inhabiting the hilly areas of Udhampur, Kathua & Doda districts.

The study was undertaken with the following objectives:

i) To study the economic status of Gaddi females.

ii) To study their role in handling financial issues in the family.

iii) To study their financial decision making patterns.

METHODOLOGY

A sample of 350 females comprising of adolescent girls and adult women from five different Geographical locations in North-Western Himalayas located in the districts of Udhampur and Doda of Jammu & Kashmir were taken. Multi-stage purposive sampling technique was employed to select the sample for the study. Males in the study were also interviewed wherever necessary. Snowball sampling technique was used to locate the subjects. A semi-structured interview schedule was used to obtain the required information. Incidental interviews were also conducted. Data was analyzed using content analysis.

RESULTS AND DISCUSSIONS

General characteristics of respondents:

Of the 350 respondents, 101 belonged to adolescent age group i.e. from 10-19 yrs. The adolescent group comprised of both married and unmarried girls. Out of total 101 adolescent females 30. 69 per cent were married and rest 69.31 per cent were unmarried girls. Thus, adolescent females comprised of about 29 per cent of the total sample while the remaining 71 per cent sample ranged from 20-60 yr.

The group of 280 married women respondents comprised of 95.2 per cent illiterate women (Table 1). The education attainment of the literate women in 5.35 per cent cases wered under primary level and a meagre 2.14 per cent of literate women were middle pass.

Of the 70 adolescent girls 64.28 per cent were aged 10-14 years while rest 35.71 per cent belong to the age group 15-19 years. The literate comprised, among others, 44.28 per cent who had attained primary level of education, 15.71 per cent who had qualified middle, thus indicating the total 60 per cent of literate females in the unmarried adolescent girl group. It was a thus evident that even though early marriage norm was much established fact among these tribal but child marriages were no longer

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Table 1. Distribution of married respondents according to their age and level of education

S. No.	Age group	Educational level				Total
		Illite-rate	primary	Middle	High	
1.	15-19	22	8	1	—	31
2.	20-24	31	3	2	—	36
3.	25-29	33	1	—	—	34
4.	30-34	28	3	2	—	33
5.	35-39	33	—	1	—	34
6.	40-44	31	—	—	—	31
7.	45-49	30	—	—	—	30
8.	50-54	23	—	—	—	23
9.	55-59	17	—	—	—	17
10.	60+	11	—	—	—	11
	Total	**259**	**15**	**6**	—	**280**

in vogue. The role of *Gaddi* women in the family economy is very significant. The decision making between men and women amongst Gaddis is almost about the same but there are certain seasons of the year when men have little work to do while women's work is more or less same through out the year.

The study revealed that the male workers predominated in the economic activities under reference. But on the other hand, that females were mostly concentrated in household and agricultural activities. A further analysis of the figures above reveal that 98.93 per cent of women were responsible for carrying the household chores and related works like cooking, looking after children, fetching water, firewood, fodder, washing clothes, cleaning utensils and house, tending cattle etc. About 88.93 per cent of them also carried out agricultural operations, carrying just ploughing operations, In plough based cultivation, transplanting, weeding, winnowing and dehusking were reported to be done by women while harvesting and threshing were done by men.

Thus women contribute directly to almost all agricultural labour without being the direct beneficiaries of agricultural inputs or capital.

As far as secondary work activities of the women were concerned 37.5 per cent were found to collect and sell the forest produce like medicinal herbs and plants. About 20.35 per cent collected some money through selling of milk in the nearby places, tea stalls, shop etc. 7.86 per cent women were selling of milk in the nearly places, tea stalls, shops etc. produced in the field in some seasons and remaining 2.5 per cent were also found to undertake spinning and weaving of traditional blankets etc, after primary work activities were over.

Only 3.92per cent of respondent females were financially independent in the entire sample. These small percentage of women were either engaged in service (at least 1 percent) and rest were either placed in this position due to family discord or due to widowhood etc. Thus majority of 96 per cent women however, were financially dependent on their husband, and in their absence, on other male members of the family for their economic needs

A picture of economic status role of the women in the surveyed families would remain incomplete without the study of money-management aspect prevailing in different household.

The study revealed that in case of maximum of 66.07 per cent households, monthly earnings were kept with the head of the family or husband or the person who earned the money and was economically active. About 11.78 per cent cases the income of the household was handled by the wife to manage the household expense. In rest of 6.07 per cent and 13.57 per cent cases, monthly income was entrusted to mothers and fathers respectively for managing the household affairs. It thus depicts that in total about 20 per cent households, the work of managing the family expenditure was laid on elders of the family owing to their experience and respect. Further analysis of figures point out that as far as women's role in handling the income was concerned, about 18 per cent of the women (wives and mothers) were allowed independent say and entrusted with the responsibility of managing the monthly income of the family. One of the obvious reasons for this may be attributed to low literacy percentage among females, especially housewives and traditional attitude of community. However, increased social awareness as a result of mass media, inter-mingling with other castes and developing social contacts, due to increased settlement of these nomads, exposure to educational facilities, increased contact with the external social change agents, the *Gaddi* women have started to play an important role in the household affairs. They were being recognized and were prepared to share more responsibilities in management of the house, outside the realm of household and agricultural work activities. This seemed the likely reason why 18 per cent females had been entrusted with the important responsibility of managing the household affairs and plan monthly budget.

An analysis of financial decision making pattern of the respondents clearly showed that control over money

was generally the prerogative of the male, the bread winner of the family. In all the financial decisions being undertook in the family, in the family, males (ranging from 82% to 96%) including father, husband and son were found to make the economic transactions. When the cash remains with the males, a women is unable to take any decision, where money is involved, within the household, expenditure is made by the males, precisely- the husbands, followed by the father -in -law whereas the women contribution is only through suggestion to the husband.

The wife's (women's) suggestion were considered primarily on household articles equipment, land property, spending on housing etc. depict less consolation of the female by the male. However, with the women becoming educated, a trend towards taking joint decisions with their husband on financial matters was also observed. This was especially the case in nuclear families and families where the women were literates.

The women's aspirations with regard to attaining more freedom while handling family budget (Table 2) reveals that about 36.07 per cent women aspire for more freedom to handle the income while planning and managing family budget. However, 50.31 per cent did not express any desire for attaining more freedom in this concern, as they were, found to be governed by traditional attitude of head of the house having the right to spend the income. Moreover, these women did not have any desire and further over-burden them with the responsibility as they had already a number of responsibilities entrusted upon them. Further revelations made it clear that they did not considere them competent enough to handle the money owing to lack of education and insufficient exposure. Although data on status and financial decision making pattern indicate the trend towards increased desire for financial independence and freedom in managing and handling financial aspects but content analysis supports the fact that control over money was generally the prerogative of the male, including three generations of father, husband and son.

Table 2. Percentage distribution of women according to their aspiration for freedom in handling family budget. **(N = 280)**

S. No.	No. of Respondents	No.	Percent (%)
1.	Aspiring for more freedom	101	36.07
2.	Not aspiring for more freedom	142	50.71
3.	Indifferent	21	7.5
4.	Not available	16	5.71

CONCLUSION

Although women contributed to family's income in the form of labour on an average 14 to 16 hours a day in terms of household maintenance, domestic affairs, bearing and rearing of children, helping in the agriculture directly in all agricultural labour, yet the activity in economically gainful work was not given recognition. Woment were not the direct beneficiary of agricultural inputs or capital and the domestic chores performed were not economically evaluated. As education globally has been found to assist the breaking up of economic isolation of women and help them to articulate wider economic processes. Low literacy among the *Gaddi* women has been reported to be an important reason for their inconspicuous role in money management.

However, growing social awareness as a result of mass media, increased social contact due to settlement of these tribals, exposure to education etc. have started playing a significant role in preparing these women to share more responsibilities in management of financial affairs in the family. This seems to be the likely reason, as unlike the past about 18 per cent female were found planning and handling the family budget.

Content analysis of financial decision making pattern of the respondents, thus clearly support the fact that control over money was the prerogative of the male, including three generations of father, husband and son (82% to 96%) respectively. Women's contribution was only through suggestion; male made any decision involving money, as the cash remained with them. However, for decisions like utilization of financial resources, sale and purchase of property and legal matters, male members of the family had an upper hand with female playing a minimal role.

Generating greater understanding of the factors supportive of women's increased decision making participation in farming system such as access to information, organisation and productive resources and access to and control over the fruits of production.

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Research Note

Private-Public Collaborative Extension : A Pilot Project in Punjab

R.K. Kalra[1], BS Hansra[2], Manmeet Kaur[3] and M.S. Hundal[4]

In spite of the fact that extension services in agricultural sector have achieved significant objectives, still many people who need it remain beyond the horizon of extension services. The reason behind this may be ill planning of programme, lack of infrastructural facilities and absence of participatory mechanisms. The public extension service has not been able to cover women, rural youth and emerging entrepreneurs in the field of agriculture. The extension services in the next millennium shall be proactive, pro-poor and pro-women. The development efforts through public extension had resulted in widening the gap between rich and poor and marginalization of women, which should be avoided through rational and judicious blending of public and private service (Chandra Shekara P, 2001). Subsistence nature of Indian agriculture is now changing to commercial agriculture. Because of this many private extension agencies are entering in the agriculture sector to influence different categories of farmers.

Both public sector extension and private firms have an important role to play in technology transfer. A publically supported extension system is essential to improve agricultural productivity and promote resource conservation practices associated with sustainable agriculture. On the other hand private extension services concenterate on commercial agriculture, value addition and marketing. In most of the cases of technology development by private agencies, research, commercial production and marketing are vertically integrated. Usually there is a tie-up between research objectives and marketing units. Under these organizational structures, there is a tendency to quickly respond to client's needs.

The above situation calls for fresh look at the role of extension in agricultural and allied activities taking into account the policies, strategies and resources required to ensure its full contribution for sustainable all-round development of the farm, home and environment. Extension education while imparting education to target people looks forward to supportive services to take part in behavioural change process so that the people enjoy their new learning experience (Sarmah RC, 2001).

Resources available with the public sector extension will always be limited in relation to the vast number and varying needs of the farmers. In order to strengthen public extension, the possibility of collaboration with private firms needs to be worked out. Collaboration refers to an agreement between two or more agencies to pursue a common goal together. Keeping all this in view, a collaborative pilot project was undertaken by Punjab Agricultural University, Ludhiana and Syngenta India Ltd., Punjab in the year 2003-04 in the form of Sahayog. This pilot project was undertaken to encourage and motivate the farmers to adopt recommended practices of PAU in rice and facilitate the farmers to make optimal use of their own resources as well as external resources for decreasing their cost of cultivation and increasing their per unit income. The project also aimed at displaying a clear comparison of grain quality and yield of the sample farmers by following the recommendations of PAU in rice cultivation.

METHODOLOGY

The study was undertaken in Ahmedgarh town of Sangrur district, a central place in Punjab state. About

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95 per cent area in this town is under rice-wheat rotation. Ten villages were selected for this pilot project. Ten acres of land from each village were selected on the basis of approachability and availability of irrigation facilities with the farmer. Thus, a total of 100 acres of land and 100 farmers comprising one acre each were selected for this pilot project. The rice varieties 'PR 114' and 'PR 113' were chosen for the project as per the recommendations of PAU (Punjab Agricultural University, Ludhiana) scientists. Two sets of data were obtained from the selected villages. The first set of data was obtained from the bench mark survey and individual contacts with the sample farmers in the year 2003 regarding the prevalent practices in rice cultivation. All the farm operations of rice undergone by the farmers were recorded in this set of data. The second set of data was collected after the implementation of the Sahayog project in the year 2004 regarding the extent of adoption of recommended practices by the sample farmers in rice cultivation.

Table 1. Status of use of recommended practices in rice cultivation by the farmers in the year 2003

Practice	V_1			V_2			V_3			V_4			V_5			V_6			V_7			V_8			V_9			V_{10}		
	R	M	L	N	R	M	L	N	R	M	L	N	R	M	L	N	R	M	L	N	R	M	L	N	R	M	L	N	R	M	L	N
Green manuring	√				√				√				√				√				√				√				√			
Seed treatment				√				√				√				√				√				√				√				√
Nursery seed rate		√				√				√				√				√				√				√				√		
Sowing time		√				√				√				√				√				√				√				√		
Transplanting time		√				√				√				√				√				√				√				√		
Fertilizer application																																
Urea	√				√				√				√				√				√				√				√			
DAP	√				√				√				√				√				√				√				√			
MOP	√				√				√				√				√				√				√				√			
$ZnSO_4$ heptahydrite		√				√				√				√				√				√				√				√		
Pe		√				√				√				√				√				√				√				√		
Disease control			√				√				√				√				√				√				√				√	
nsect-est control	√				√				√				√				√				√				√				√			

Note: V_1 to V_{10} refer to the ten villages selected for the project.
R : Recommended; **M** :More than recommended; **L** :Less than recommended; **N** :Not done

Extension approaches used

A bottom to top approach was used taking into consideration farmers' needs and resources available with the farmers. For effective participation of the farmers and efficient planning, execution and sustenance of the project, the farmers were chosen on the basis of their willingness to experiment and adopt innovative practices. The programme of work was finalized by the scientists of PAU, farmers and officials of Syngents India Ltd.

The scientists of PAU were involved at each stage of the project i.e. planning and implementation. Various training camps and campaigns (seed treatment) were organized by the scientists for effective dissemination of technology. Literature was also distributed among the farmers as a dissemination tool.

RESULTS AND DISCUSSION

Status of use of recommended practices in rice cultivation by the farmers in the year 2003.

The data in Table 1 revealed that practices like green manuring, seed treatment and fungicidal sprays for disease control were negligibly prevalent among the selected farmers. Seed rate of paddy for nursery growing was very less as compared to the recommended seed rate. Apart from that, sowing of paddy nursery and then its transplantation were done quiet early as compared to the recommended timings. Lower doses of ferrous sulphate sprays were applied in the fields as compared to the recommended doses.

In case of fertilizer applications, Urea, DAP and MOP were applied in much higher quantities as compared to the recommended quantity. Also, invariably higher doses of insecticidal sprays were applied in the paddy crop for insect-pest control. Only zinc sulphate heptahydrite was applied as per the recommendations of the scientists.

Extent of adoption of recommended practices in rice cultivation by the farmers

The data in Table 2 showed that there were 17 per cent farmers practicing green manuring in their fields as compared to five per cent before the commencement of the project. Similarly, in case of seed treatment of paddy, there was an increase of 43 per cent farmers performing this operation after the commencement of this project. There was not much significant increase of farmers adopting recommended seed rate of paddy. Thirty five per cent of farmers started sowing and transplanting rice at the recommended time as against 10 per cent before the introduction of the project. Regarding fertilizer application, 33 per cent farmers adopted the recommended doses of Urea, 12 per cent in DAP, 45 per cent in MOP, 93 per cent in $ZnSO_4$ heptahydrite and 16 per cent in $FeSO_4$ in the year 2004 as against 20 per cent in Urea, 5 per cent in DAP, 25 per cent in MOP, 82 per cent in $ZnSO_4$ heptahydrite and 5 per cent in $FeSO_4$ in the year 2003. There was a very significant increase in the percentage of farmers (34%) adopting disease control practices. Twenty six per cent of farmers adopted the recommended insect-control practices as against 10 per cent before the commencement of the project. Thus, the percentage of farmers adopting these 13 practices was 14.3 per cent and 31.77 per cent before and after the introduction of this project respectively. This means that there was an increase of 17.47 per cent farmers adopting recommended practices in rice cultivation.

Table 2. Extent of Adoption of recommended practices in rice cultivation by the farmers

Practice	% of farmers		Increase in percentage
	Before	After	
Green manuring	5	17	12
Seed treatment	10	53	43
Nursery seed rate	-	5	5
Sowing time	10	35	25
Transplanting time	10	35	25
Fertilizer application			
Urea	20	33	13
DAP	5	12	7
MOP	25	45	20
$ZnSO_4$ heptahydrite	82	93	11
$FeSO_4$	5	16	11
Disease control	9	43	34
Insect-pest control	10	26	16

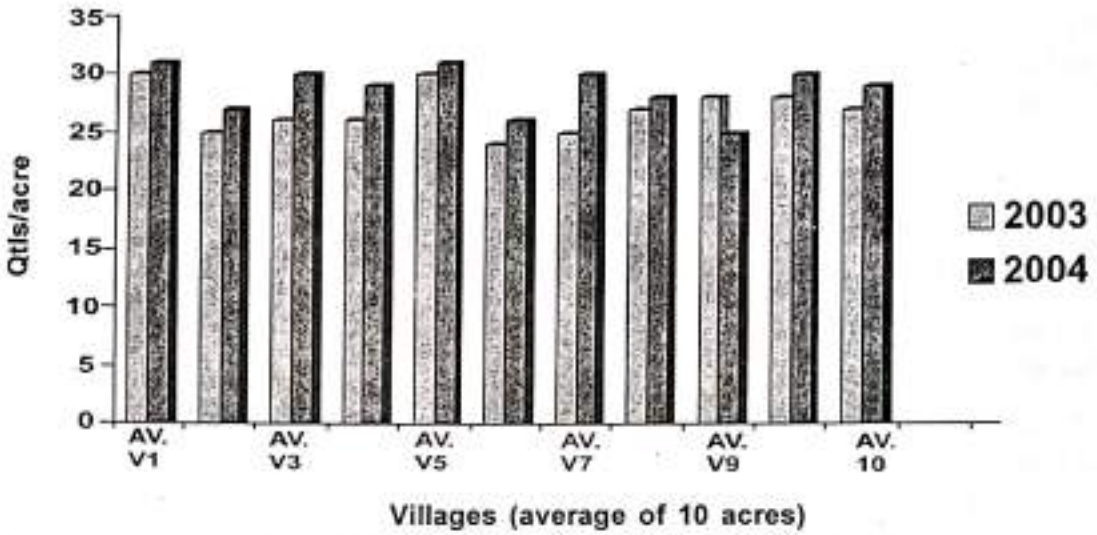

Figure 1. Comparative yield of farmers in Sahayog project for the year 2003 and 2004

Average yield of ten acres from each selected village was calculated and as shown in Figure 1. The yields were significantly higher in all the ten villages except village 9 where the paddy crop suffered from severe hopper attack which was reported late by the farmers.

Some of the recommended practices in rice cultivation were new for the sampled farmers. Seed treatment of paddy was introduced to the sample farmers during this project. The beneficiary farmers found visible advantage of this practice as there was no disease attack on the crop. On the other hand, sample farmers did not observe any difference in increasing the seed rate for nursery sowing of paddy. They considered it as incompatible and lacked relative advantage and hence adoption in this case was low. Regarding the sowing and transplanting time, farmers maintained to perform this practice early because of the labour shortage during the peak season. Hence the recommended timings for sowing and transplanting in the main field were less compatible and complex to follow for the farmers. But there were few farmers who found that sowing and transplanting of paddy at recommended time had relative advantage in the long run in terms of optimum utilization of water. In case of fertilizer application, farmers were convinced that applying more fertilizer means obtaining more yield but they were unaware about the expenses being incurred on the purchase of these fertilizers. It was found that the farmers applied more fertilizers based on their observability on the ongoing trends among majority of the Punjab farmers. Similar trend was observed in case of pesticidal sprays for controlling insect-pest attack. As regards control of diseases in paddy, majority of the sample farmers said that diseases did not affect the crop. However, due to the awareness created by the PAU scientists, the farmers adopted the recommended chemicals as a preventive measure against diseases.

Adoption of recommended practices increased the overall grain yield in all the selected villages. The increase in yield ranged from one quintal per acre to five quintals per acre. The beneficiary farmers were found satisfied with the use of recommended practices. The collaboration pilot project of government and private agency has proved to be fruitful for the farmers. It has helped in reducing the financial burden of the government agency and provided an expert team to a private agency for solving the farmer's problems. Thus more such projects should be undertaken in wider perspectives to help the farming community.

Suggestions and Implications

Whenever there is collaboration between a public and a private agency, an agreement between the two agencies should be mandatory stating clear cut division of responsibilities and authority. The public agency should play a leading role in planning, budgeting and executing the programme while the private agency should play a supportive role by supplying the resources required by the public agency for execution of that programme. Identification of problems and need based issues should be done through participatory mechanism following a bottom-top approach. Further, the developmental programmes should also be finalized in consent with the local people.

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Research Note

SWOT Analysis : A Case of Bihar Women Dairy Project

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The SWOT analysis can act as an important tool in evaluating the different developmental programmes that vary widely in content and approach. Through this strong and weak points of the project along with prevailing opportunities as well as threats of a project emerge out, which in turn can bring about the required improvements in the on-going as well as future project to achieve better results. It also enables the project managers to consolidate the strengths of the project and harness the available potentials. Keeping this in view, SWOT Analysis of Bihar Women Dairy Project (BWDP), a project to empower rural women through dairying, was conducted.

METHODOLOGY

The present study was conducted in Bihar State Cooperative Milk Producers' Federation (COMPFED). Keeping the operational area in view, by using stratified random sampling, Tirhut Milk Union Ltd. (TIMUL), Muzaffarpur and Barauni Milk Union (BMU), Barauni were selected for this study. In all, 30 women beneficiaries (as respondents) were selected randomly by using proportionate sampling technique at project level. The data were collected with the help of well-structured and pre-tested interview schedule.

RESULTS AND DISCUSSION

The Strengths, Opportunities and Threats of BWDP were studied and the analyzed data has been depicted in Table 1.

Strengths (S)

Under the studied project, several strengths were identified amongst which the important ones have been discussed as below along with their ranks:

Greater participation of the beneficiaries

After launching and execution of many developmental projects in country, it has off late being realized in the last two decades that the participation of the beneficiaries is essential in the planning and execution of any project and for that matter BWDP is not an exception. The analysed data in the table indicates that participation of the beneficiaries in the project obtained first rank. Comparing other ongoing projects in the area, beneficiaries clearly told that they are participating more in this project. Whereby it indicates that the beneficiaries can ensure the planed change as conceived in the project. In fact, BWDP will open new vista for women empowerment in the operational area.

Multi-agency coordination

Based on the observations made in the selected area, it was found that BWDP is in operation under the control of COMPFED. No doubt, the project is running as per its mandate and objectives, but based on the responses ascertained from the respondents, it was found that integrated approach is creating better impact, as was perceived by majority of the beneficiaries and was ranked second.

Sufficient manpower

Availability of required manpower is utmost essential for success of any programme/project. Based on the observations made, discussions with the respondents and analyzed data indicated as rank third, it was found that in BWDP sufficient manpower was available in the study area to plan and execute the project. And it indicated that the beneficiaries got acquainted with the different dimensions of the project clearly and timely.

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[2] Assistant Director General (Agril. Exten.), ICAR, KAB-I, Pusa, New Delhi.
[3] Scientist (SS) (Agril. Extn.) Division of Dairy Extension, NDRI, Karnal (Haryana) 132 001.

Table 1. SWOT of Bihar Women Dairy Project (Overall basis): Perception of beneficiaries

(N =30)

S. No.	Statements	Responses			Total Score
		Agree (3)	undecided (2)	Dis-Agree (1)	
A.	**Strengths (S)**				
1.	Presence of efficient field worker.	15	3	12	63
2.	Supervision and follow-up done by the field assistant	8	3	19	49
3.	Presence of effective communication system	19	0	11	68
4.	Clarity of the purpose amongst the visiting staffs	20	1	9	71
5.	Greater participation of the beneficiaries	22			
6.	High level of faith towards the officials of these programmes	10	2	18	52
7.	Sufficient manpower to plan and execute these programmes.	18	7	5	73
8.	Multi-agency coordination has better impact	21	2	7	74
B.	**Weaknesses (W)**				
1.	Much work assigned to the project workers	22	2	6	76
2.	Non-availability of the veterinary services	24	0	6	78
3.	These programmes are not on the top priority	18	5	7	71
4.	Most of the beneficiaries are illiterate and are not benefitted	9	6	15	54
5.	The number of women field assistants are not sufficient	19	4	7	72
6.	The training programmes for the beneficiaries are not timely and adequate	21	3	6	75
7.	There is less number of factors in this project to motivate the clientele group as compared to previous projects	8	3	19	49
C.	**Opportunities (O)**				
1.	Apart from dairying, other vocations could be tapped at village level	23	3	7	79
2.	Women-led societies need be created	18	5	7	71
3.	The community work also can be done in collaboration with the dirying	16	3	11	65
4.	The project could identify the skillful women and help them for establishing new avenues in other areas	20	3	7	73
5.	The women got chance to get rid from the imposed "glass ceiling syndrome"	7	5	18	49
D.	**Threats (T)**				
1.	Due to more emphasis on women male members are not cooperating the officials.	13	4	13	60
2.	Ineffective implementation of the project resulted into the dissatisfaction of the participating women	12	3	15	57
3.	Presence of traditional norms in the society	16	6	8	68
4.	Projects are not tailored base on need identification	14	7	9	65
5.	Less creation of infrastructural facilities	21	3	6	75

Weakness (W)

At present it is considered important that the weaknesses of any project should be studied at each stage viz., project formulation, execution, monitoring and evaluation. With this preamble in mind, weaknesses of the project as perceived by the respondents were identified.

Non-availability of veterinary services

Veterinary services have great bearing on the status of dairying in any area, as it provides essential services for health coverage to dairy animals. Based on the data analyzed it was observed that majority of the respondents felt that the required veterinary services were insufficient due to which they have a face a lot of problems. The non-availability of good quality semen for Artificial Insemination, repeat breeding problems as reported by the farm women is the weakness of this project, which need be attended promptly so that the beneficiaries could get real benefit of the project.

Much work assigned for project workers

Majority of the project workers who were visited to the operational area spared less time for the beneficiaries due to having much assigned work with them. As a result, they had less available time with the beneficiaries for interaction and other works. Moreover, the respondents expressed that if more time with limited assigned work are given to the project workers, then probably they can assist the beneficiaries in a better way.

Inadequate training programmes

Training is an intellectual investment for enhancing the skill and knowledge of an individual. Mere supply of inputs and services cannot yield excellent results unless the human resource with which we work is trained in a particular trait.

Majority of the respondents were not much aware of the training programmes that they can undergo in various areas of scientific dairying. Upon narrating to the individual respondent the various training programme that can enhance the skill & knowledge for ultimate economic gains through improved dairying the responses were ascertained. It was found that most of them have not attended any training programme and suggested that such training programmes on dairying apropos clean milk production, its collection and preservation, should be organized at village/block levels.

Opportunities (O)

Opportunities could be seen with the perspective as the hidden and ignored areas that if diagnosed properly in any project can help in minimizing the weaknesses and in turn improvised strengths. With this logic, a frame of statements were critically made and put to individual respondent to ascertain responses.

Identification of other vocations

No doubt, dairying is an integral part of mixed farming system and provides regulate income and employment in the rural areas, but there could be various other vocations that need be identified and be supplemented for gearing up rural household economy. As ranked first, majority of the women stressed that apart from dairying, other vocations like ghee making & packing, paneer making, etc. need be tapped at village level and be operationalized particularly amongst the rural women, so that the socio-economic status be further improved in rural areas.

More women-led societies

Although under BWDP, the respondents were rural women and were running the dairy cooperative societies by their own efforts under the guidance of COMPFED, but majority of them felt that similar women-led societies need be created in the non-operational areas.

Threats (T)

The threats, if studied properly when a programme is in planning stage or in execution mode, then on plugging the threats well in time, the success rate of the project can be enhanced. With the present perspective the various threats that were experienced by the beneficiaries were ascertained and given below:

Infrastructural facilities

Although at the stage of study the project was running successfully, yet, one serious threat ranked first by majority of the respondents that infrastructural facilities essentially required at village level need be created, wherein the beneficiaries can have a comfortable environment which will lead to ultimate success of the project.

Presence of traditional norms in the society

In the study area, majority of the people had faith in the traditional norms as was ranked second by majority of the women stating that these norms are the threats for the project. These norms create problems especially for the women to participate in different activities as planned by the project officials.

Nature of the project

Even in this project the researcher has observed that the bottom-up approach was not followed strictly while conceiving the project. As was revealed by majority of the respondents it was opined that the need identification of the beneficiaries was not conducted properly.

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Research Note

Constraints in Adoption of Hybrid Rice in North Bihar

N.V. Kumbhare[1]

Rice is one of the important cereal crops under rice-wheat cropping system of north Bihar. A large number of farmers are growing improved as well as local paddy varieties according to the land and water availability. The maximum area in north Bihar comes under low land where rice is mainly grown in kharif season in about 35.7 lakh hectares with total production of 56.7 lakh tonnes. The productivity of paddy crop in Bihar is 14.80 q/ha which is very less as compared to Punjab (35.45 q/ha), and Tamil Nadu (32.63 q/ha). Recently the IARI has developed and released Pusa RH-10, the first superfine aromatic hybrid rice which matures 20 days earlier than Pusa Basmati-1. Yield advantage of 70 to 80 q /ha at farmers' field has been reported. As per IARI Director's Report of 47th Convocation it has been reported that PRH-10 hybrid rice because of its high yield quality and public-private-partnership (PPP) efforts made by the Institute in just three years, it has spread on 6 lakhs hectares providing an additional benefit of 2000 crores per annum due to its short duration high yield and quality grains. In order to ascertain its performance and perceived constraints among the farmers about adoptability of the newly developed high yielding scented hybrid rice cv. Pusa RH-10, fifty Front Line Demonstrations (FLDs) were conducted at the farmers' field.

METHODOLOGY

The present investigation was carried out in purposively selected five villages of Samastipur district of Bihar state during the kharif season 2003-04. The data were collected with the help of specially designed interview schedule from fifty participating farmers involved in the demonstration of hybrid rice Pusa RH-10 after an intervening period of one year. The performance of the hybrid rice was assessed and the perceived

Table 1. Distribution of respondents according to constraints encountered in adoption of Hybrid Rice (PRH-10)

(N=50)

Constraints	Frequency	%	Rank
Technical constraints			
Lack of know-how about production technology	7	14.00	XII
Lack of information about pest and diseases	15	30.00	VIII
Breakage of grains during milling/processing	46	92.00	II
Low cooking quality due to breakage of grains	25	50.00	VIII
Problem of weed infestation	13	26.00	X
Market Constraints			
Low market price due to breakage of grain	45	90.00	III
Lack of transportation facilities	30	60.00	V
Lack of market facility	39	78.00	IV
Resource Constraints			
Non-availability of seed at proper time	26	52.00	VII
High cost of hybrid seed	27	54.00	VI
Non-availability of rubber milling facility	48	96.00	I
Lack of irrigation facility	30	60.00	V
High cost of fertilizers	13	26.00	X
High cost of pesticides	9	18.00	XI

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constraints of farmers in adoption of the designated variety were evaluated by using simple statistical procedures like frequencies, percentage and ranking.

RESULTS AND DISCUSSION

During the first year, the performance of the paddy demonstrations was very encouraging with average yield of 45-50 q/ha which is 60-65 per cent higher than local cultivars. The perceptions of the farmers about the constraints in adoption of the demonstrated hybrid rice were recorded after one year of conducting the FLDs. It was found that an overwhelming majority of farmers (90.00%) were not inclined to adopt the scented hybrid rice due to certain constraints faced by them. The relevant results are depicted in Table1.

Technical Constraints

It is observed from data recorded in Table-1 that breakage of grain during milling/ processing (92.00 %) followed by low cooking quality due to breakage of grains (50.00 %) and Lack of information about pest and diseases (30.00 %) were the major technical constraints encountered by the respondents in adoption of hybrid rice.

Market Constraints

The major market related constraints faced by the farmers were low market price due to breakage of rice grain (90.00 %), lack of market facility (78.00 %) and lack of transportation facilities (60.00 %).

Resource Constraints

The data in respect of resource constraints indicated that 96.00 per cent respondents expressed the non-availability of rubber milling facility in their locality for rice processing was a major constraint in adoption of Pusa RH-10 as it is fine and long grain rice, where the breakage is above 60 per cent through normal milling. This was followed by lack of irrigation facility (60.00 %), high cost of hybrid seed (54.00 %) and non-availability of seed at proper time (52.00 %).

CONCLUSION

The findings of the study lead to conclude that the three top ranking constraints faced by farmers in adoption of hybrid rice PRH-10 were non-availability of rubber milling facility (96.00%) followed by breakage of grains during milling/processing (92.00 %) and low market price due to breakage of grains (90.00 %). The major constraints faced by farmers in adoption of hybrid rice variety in north Bihar are the non-availability of seed at proper time, high cost of hybrid seed, and breakage of grains during milling, non-availability of rubber mills in the area and low market price due to damage/breakage of grain. The government agencies and commercial units like input supply and processing agencies do have an important role to provide the needed support and facilitation to the paddy growers to overcome the constraints and thereby promote adoption of high yielding hybrid rice to improve the productivity and profitability in north Bihar.

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Research Note

Perception of Development Officials about Krishi Vigyan Kendras

Lakhan Singh[1], L.K. Tyagi[2] and Rajiv Kumar Singh[3]

The front line extension projects of the ICAR through Krishi Vigyan Kendras (KVKs) were initiated to show the production potentialy of modern agricultural technologies at farmers' fields, testing the technologies to identify their location specificity with farmers' perspectives including both bio-physical and socio-economic factors, organizing extension programmes in selected area arount the centre to serve as extension models.

The Indian Council of Agricultural Research (ICAR) has developed strong monitoring mechanism for KVKs at different levels (ICAR, Zonal and KVK levels). Organizing national workshop, zonal workshop at the state level, mid-term review workshops at State Agricultural Universities (SAUs) level, Scientific Advisory Committee (SAC) meetings at KVK level and personal field visits by the scientists of ICAR adn concerned SAUs are major monitoring mechanisms. In addition to these, the QRT team plays an important role in reviewing and monitoring the KVK activities once in five years. SAC meeting is one of the most important monitoring mechanisms followed. SAC is constituted at each KVK under the chairmanship of the concerned Head of institution. The main aim of organizing such meetings is regular monitoring and reviewing the overall functioning of KVKs. The committee also discuses the progress report and proposed action plan for coming six months. The district level departmets, agricultural universities, progressive farmers and farm-women, SHG/ FIG members and ICAR representatives (Zonal Coordinator/Sr. Scientists) are its members (Shukla, 2000 and Choudhary, 1999). The meeting is held normally twice a year.

A important component in the functioning and participatory monitoring mechansim of any KVK is the extent of linkage and involvement of district line departments in planning, monitoring and evaluation of the activities of KVK.

The present study has been undertaken with the objective of investigation the perception and experiences of the officials of district line departments about KVKs and to document and analyze the suggestions given for improvement of action plant towards participatory management of KVKs, as perceived by the district level departments' officials.

METHODOLOGY

The study was conducted during 2001-2006 in Uttr Pradesh where 73 KVKs are working for tranferring latest farm technologies to the farmers. Scientific Advisory Committee (SAC) meetings organized for finalization of future action plan adopting participatory approach with the active involvement of all the committee members were considered for the study. The investigator participated in 62 SAC meetings at different KVKs. During participaton in the SAC metings, experiences and option of the participating line department officials were recorded by using participant-observations and informal interactions. In these meetings, district officials participated for improving annual action plan of KVKs. To supplement the recorded participant-observations, a total of 186 respondents from 62 SAC meetings (three respondents from each meeting) were interviewed by using semi-structured interview schedule. The interview schedule consisted of statement reflecting six dimensions which were finalized after through discussion with the subject matter specialists of KVKs.

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RESULTS AND DISCUSSION

Awarness about philosophy of KVK

The involvemet of state line departments' officials in SAC meeting can contribute towards relevant modifications and improvement in action plan of KVK activitis, if they are well obtained about philosophy and approach of KVKs. The study showed tht most of the respondents (about 81 %) had awareness about philosophy of KVKs while one-fifth of the respondents were not aware about philosophy and approach of KVKs.

Sensitivity of people's problems

The result indicated that most of the respondents (46.24%) were sensitive towards people's problems, whereas, rest of the respondents were either les sensitive (31.72%) or not sensitive (22.04%) about people' problems. Thus, about half of the respondents did not have adequate concern for peopl's problems.

Initiative of joint action plan

Most of the district line departments work for agricultural and KVK is also a part of such endeavor. But to avoid duplication of actvities, a joint action plan is supporsed to be developed at KVK level. SAC meeting is one such ideal platform where all the concerned district line departments and KVK officials together can develop need based action plan with required modifications. But it will be interesting to know that practically how much of its has been materialized. In this context, the study revealed that majority of the respondents (52.62 per cent) had not taken initiative on joint action plan whereas one third of the respondents had taken moderte initiative.

Experience sharing

About 50 per cent of the respondents always shared their experiences in SAC meetings. On the other hand, one fourth of the respondents had shared their experiences sometimes whereas, rest of the respondents never shared their experiences among the SAC members. Unique experiences shared were utilized as a part of lessons learnt and incormporated in modifying the action plan of KVK.

Opinion about women's participation

A majority of the respondents reported that women's participation was less where as only one-fifth of the respondents reported adequate participation.

Agenda of SAC meeting

An outline and agenda of SAC required to be circulated to all members well in advance for effective interaction on identified items during the meetings. To measure this variable, respondents were interviewed and their responses were categorized in to three categories (dealt adequately, dealt moderately and not dealt). The investigation showed that only one third of the respondents expressed that agenda of the meeting was dealt adequately where as one fourth of the respodents opined that agenda of SCA meeting was not dealt.

Responses of development officials regarding framer's queries

Development officials showed their inability to solve the problems of farmers due to insufficient manpower, scarcity of funds, busy in non-agriculture extensions activities, frequent transfers in others districts, and having lack of faith in village people. In this regard several training courses should be organized to build the faith between farmers community and development functionaries.

Suggestions given during meetings

The study showed (Table 1), that the major suggestions given can be grouped under three broad categories to reflect their concern for (i) technological advancement and availability of technology (ii) capacity development of the stakeholders (i.e. farmers / farmwomen), and (iii) extension methods and facilities.

The suggestions which came up in majority of the SAC meetings included need to introduce location specific new crops, quality seed and planting material availability, income generating activities self-help group formation, developing extension literature and training on integrated farming systems models.

CONCLUSION

Though most of the line department officials were aware about the philosophy of KVKs still necessary efforts should be taken to orient the remaining officials towards approach and philosophy of KVKs. There is need to increase the sensivity of the state line departments' officials towards problems of the people by designing and implementing relevant training courses. Participatory management of KVK cannot be possible unless all concerned with management are highly sensitized to needs

Table 1. Suggestions given during meetings by SCA members

S. No.	Suggestions	f	%
1.	Introducing location specific new crops	50	80.64
2.	Quality seed and planting material availability	59	95.16
3.	Diversification of agriculturae	35	56.45
4.	Soil and water testing facility	17	27.42
5.	Income generating activities	48	77.42
6.	Self Help Group formation	43	69.35
7.	Revolving fund generation	21	33.87
8.	Fax and internet facilities	24	38.71
9.	Developing extension literature	40	64.52
10.	Farmers' exposure visits	25	40.32
11.	Economic analysis of 'on farm trails' and front line demonstrations	28	45.16
12.	Training on use of bio-fertilizers and bio-pesticides	45	72.58
13.	Training on resource conservation technologies	41	66.13
14.	Training on post harvest processing /technologies	19	30.64
15.	Introducing zero ferti-seed drill	25	40.32
16.	Trainng on processing of dairy products	30	48.39
17.	Weather and market related awareness	39	62.90
18.	Crop cafeteria at the centre	50	80.64
19.	Success and failure case studies	19	30.64
20.	Integrated farming system models	46	74.19
21.	Field days at appropriate time	34	54.84

and concerns of the people. Whatever discussion is held among the SAC members and decisions are finalized to include in joint action plan of KVK the responsibility and accountability for taking initiative on those decisions must be fixed and monitored for effective implementation. Greater sharing of experience by different stakeholders should be promoted in the SAC meting for mutual learning. Failure experiences should not to be discouraged. Neglible participation of women's representatives would result in ignorance of their needs and problems in action plan of KVK's therefore efforts need to be intensified to enhance participation of women and their contribution in SAC meetings. Greater emphasis should be given not only to prepare proper SAC agenda in advance but also to take care that it is dealt adequately during the meetings as planned for getting real input from experienced SAC members.

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