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Intervention of drudgery reducing technologies in agriculture and impact evaluation

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Abstract. Agriculture is main source of livelihood for majority of the population in India. Agriculture has been established as one of the drudgery prone occupation of unorganized sector due to lack of access to improved agricultural technologies. The present study was planned to assess intervention of drudgery reducing technologies in agriculture and its impact evaluation. The drudgery areas/activities in agriculture were identified. Participatory field level skill training for proper use of the ergonomically improved farm technologies were given to men and women in separate groups. An intervention package consisting of improved sickle, wheel hand hoe, capron, cot bag and protective gloves was introduced in village *Shahpur*. Data were collected to quantify the impact of intervention on the level of drudgery of worker before and after the technology intervention from sample of 30 respondents (15 male and 15 female) selected randomly from village *Shahpur*. Gain in knowledge and change in awareness level were calculated after the training.Evaluation of field validation of technology on drudgery of men & women was done after its use in the field conditions. A significant gain in awareness was observed among both men(2.6) & women (3.0) whereas the gain in knowledge was more among men (6.6) than women (4.5). In evaluation of field validation of technology on drudgery it was found that all the five technologies reduced the drudgery of men as well as women. However wheel hand hoe was used successfully by men in comparison to women who preferred to use their conventional technology i.e improved long-handled hoe. Evaluation of validation trials of the technologies reported that improved sickle was used successfully by both men & women farmers. More than half of the men farmers (53.3%) & only 13.3 percent women farmers preferred the wheel hand hoe over the traditional one as they found it four times more efficient in terms of time, energy & money saving. Cot bag was preferred by the entire sample. Capron was preferred by four-fifth of the men farmers (80.0%) whereas women farmers did not prefer it much. Only one third of men (33.3%) & 26.7 percent of women farmers preferred using gloves while harvesting of guar & picking of cotton.

Keywords: awareness, knowledge,field validation

1. Introduction

The main source of livelihood of 70% population in India is from agriculture. Agriculture is one of the most labour intensive occupations of unorganized sector. In India 93% of total work forces are employed in unorganized sector, where health and stress are worse. (Ratnam). Heavy workloads, drudgery resulting in stress and poor health in agricultural work usually has been overlooked. In the view of heavy manifold workload of the agricultural workers, making available, simple labour saving cost effective technologies for agricultural workers would save million of workers from drudgery, stress and ill health. These technologies should fulfill the criterion of reduced energy expenditure, stress, workload, time spent, body disorders, fatigue and drudgery and in turn enhance productivity, efficiency, quality of produce, income and satisfaction of the agricultural workers. Accordingly there is a need to develop technologies appropriate for the farmer's requirement. Though a number of technologies have been developed by R&D institutions of the country but not yet reached the rural clientele. A research done under AICRP on Home Science –Family Resource Management component identified drudgery prone areas

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in agriculture and suggested appropriate technologies (AICRP, 2002-03). These technologies were disseminated for further interventions, through participatory field level skill training. Keeping in view all these the present study was planned to assess intervention of drudgery reducing technologies in agriculture and its impact evaluation.

2. Methodology

The drudgery areas/activities in agriculture were identified; the appropriate technology which, would reduce the drudgery and increase the productivity and efficiency, thereby, reducing the health hazards of the worker were introduced by AICRP FRM (AICRP, 2002-03). List of technologies developed/modified/ evaluated ergonomically for the identified drudgery areas in agriculture were finalised. Participatory field level skill training for proper use of the ergonomically improved farm technologies were given to men and women in separate groups.

These appropriate technology were introduced to sample of 30 respondents (15 male and 15 female) selected randomly from village Shahpur. An intervention package consisting of the drudgery reducing technologies viz. cot bag (for cotton picking and vegetable picking), capron (protective face mask), improved sickle (serrated self sharpening blade), wheel hand hoe (for weeding) and protective gloves (used during harvesting) were introduced through training. Knowledge and awareness of the respondents was measured before and after the training through a pre tested questionnaire comprising of various statements to collect information regarding the knowledge and awareness on drudgery reducing technologies. Awareness was assessed on 2 continuum scale (yes -1 and no – 0) on the basis of awareness regarding name and purpose of technology. Knowledge was assessed on 3 continuum scale (fully aware – 1, partially aware- 0.5 and not aware – 0). Knowledge was evaluated on the basis of their knowledge regarding features, cost, place of availability of technology and procurement through government schemes. Score were given to each response and accordingly knowledge and awareness scores were calculated before and after the training. Gain in knowledge and change in awareness level were calculated after the training.

Data were collected to quantify the impact of intervention on the level of drudgery of worker before and after the technology intervention. Evaluation of field validation of technology on drudgery of men & women was done after its use in the field conditions. A survey tool consisting of statements to measure user opinion on the improved technology after ergonomic intervention was used for evaluation of field validation of drudgery reducing technology on sample.

3. Results

Results are presented in following heads:

- Awareness and knowledge of farmers on drudgery reducing technologies
- Evaluation of field validation of technology
- Evaluation of validation trials

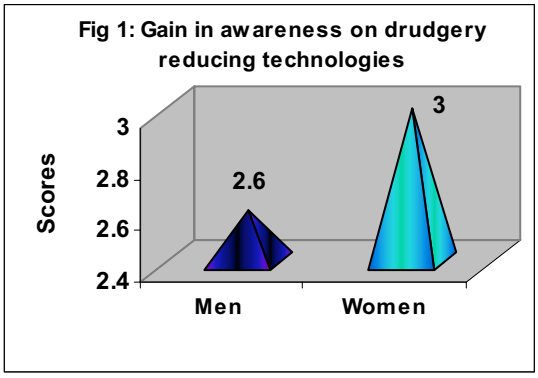
Table 1
Awareness and knowledge of farmers (men & women) on drudgery reducing technologies in agriculture
N = 30

	Awareness				Knowledge			
	Pre-test score +/- SD	**Post test Score +/- SD**	**Gain in awareness score**	**t' values**	**Pre-test score +/- SD**	**Post test Score +/- SD**	**Gain in awareness score**	**t' values**
Men (n=15)	4.6 +/- 2.11	7.2 +/- 1.63	2.6	5.73**	6.8+/- 5.1	13.4 +/- 2.2	6.6	17.36**
Women (n=15)	4.4 +/- 2.82	7.4 +/- 1.12	3.0	10.21**	6.4+/- 6.8	11.1 +/- 5.83	4.5	15.76**

** Significant at 5 % level of significance

3.1 Awareness and knowledge of farmers on drudgery reducing technologies in agriculture

Table 1 show the awareness of farmers (men & women) on drudgery reducing technologies in agriculture. Pretest scores revealed that men obtained higher scores (4.6) regarding the five selected technologies in comparison to women (4.4). A significant gain in awareness was observed among farmers, both men & women (Fig 1). However, the gain in awareness was more among farm women (3.0) as compared to men (2.6).



Knowledge of farmers regarding these technologies highlights (Table 1) that knowledge of farmers regarding these technologies the pretest knowledge scores were 6.8 for men than 6.4 for women. A significant gain was observed in knowledge of men & women both regarding these technologies (Fig 2). However, the gain in knowledge was more among men (6.6) than women (4.5). Mostly they were fully aware about the features of the technology and partially aware about the cost of the technology but were not aware about the place of availability and procurement of technology through govt. schemes.

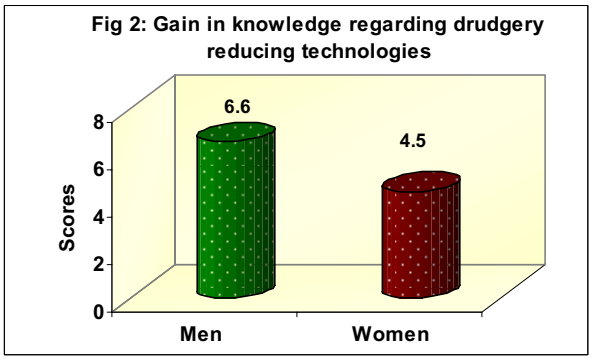


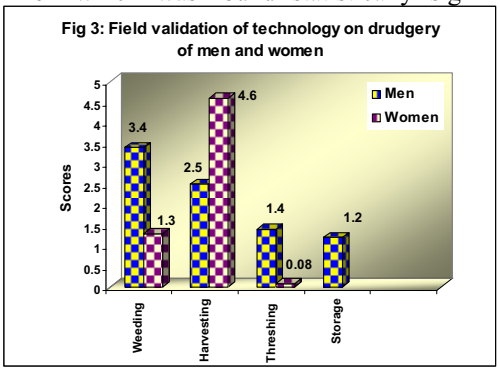
Table 2
Evaluation of field validation of technology on drudgery of men & women (N=15)

	Identified drudgery prone Activities	**Technology used for Intervention**	**Pre test drudgery Score**	**Post test -1 drudgery Score**	**t' values**
Men	Weeding and inter-culturing	Wheel hand hoe, Improved long handled hoe	26 +/- 1.51	22.6 +/- 1.29	5.97**
	Harvesting	Improved Sickle, Cot bag, Capron, Gloves	26 +/- 1.41	23.5 +/-1.24	8.48**
	Threshing & Processing	Capron, gloves	18 +/- 1.25	16.6 +/- 1.29	7.35**
	Storage & Marketing	Capron	17.4 +/-	16.2 +/-	3.67**
Women	Weeding and inter-culturing	Wheel hand hoe, Improved long handled hoe	25 +/- 2.07	23.7 +/- 1.75	8.26**
	Harvesting	Improved Sickle, Cot bag, Capron, Gloves	29 +/- 0.84	24.4 +/-1.40	11.5**
	Threshing & Processing	Capron	23 +/- 2.32	22.06 +/- 1.90	3.76**

** Significant at 5 % level of significance

3.2 Evaluation of field validation of technology on drudgery

Evaluation of field validation of technology on drudgery of men & women was studied & given in table 2 and figure 3. Technology package for weeding & interculturing, consisting of wheel hand hoe & improved long handled hoe, reduced the drudgery of men which was found statistically significant.



Improved sickle, cot bag, capron & gloves were the appropriate harvesting technologies which were found efficient in reducing the drudgery significantly. Similar results were observed for use of capron & gloves in threshing & processing activities and also use of capron in storage of produce.

Similarly for the women, use of technology viz., wheel hand hoe, sickle, cot bag and gloves reduced their drudgery in weeding & interculturing, harvesting and threshing & processing activities. Observations revealed that cot bag and improved sickle reduced the drudgery of women significantly. Capron was used more as a protection measure in the sun whereas men used it successfully during threshing activity. Gloves were also used by men & women during harvesting of guar crop. Wheel hand hoe was used successfully by men in comparison to women who preferred to use their conventional technology i.e improved long-handled hoe. There is a need to mention that since women preferred to use their conventional technology, the long handled tool was modified and given back to them for use. This improved long handled hoe was preferred by them.

Table 3
Evaluation of validation trials N=30

Name of the technology	Decision making on technology selection of farmers							
	Farmers preferring conventional method only		Farmers preferring improved technology		Farmers suggesting modification on technology		New innovations tried by farmers	
	Men n=30	Women n=30	Men n=30	Women n=30	Men n=30	Women n=30	Men n=30	Women n=30
Cot Bag	-	-	15 (100.0)	15 (100.0)	-	-	-	-
Capron	3 (20.0)	14 (93.3)	12 (80.0)	1 (6.6)	4 (26.7)	1 (6.6)	-	--
Improved Sickle	-	--	15 (100.0)	15 (100.0)	-	1* (6.6)	-	-
Wheel Hand Hoe	7 (46.6)	13 (86.6)	8 (53.3)	2 (13.3)	8 (53.3)	2 (13.3)	2 (13.3)	-
Gloves	10 (66.6)	11 (73.3)	5 (33.3)	4 (26.7)	2 (13.3)	1 (6.6)	-	-

* Left handed respondent

3.3 Evaluation of validation trials

Evaluation of validation trials exhibited observations on farmers preferring conventional method only, farmers preferring improved technology, farmers suggesting modification on technology and new innovations tried by farmers for the selected technology has been presented in Table 3

Improved sickle was used successfully by both men & women farmers. They reported reduction in drudgery and increase in work efficiency. However, one of the women farmers gave suggestion to make this sickle compatible for left hander also.

Wheel hand hoe- More than half of the men farmers (53.3%) & only 13.3 percent women farmers preferred the technology over the traditional one as they found it four times more efficient in terms of time, energy & money saving. Moreover, they gave suggestions to make it adjustable for various crops according to the crop distance. Men (13.3%) also tried new innovations. Majority of the women preferred conventional method of using long handled hoe though improved one.

Cotbag The technology being used for picking cotton was preferred by cent percent of the respondents as it reduced the drudgery and also increased their efficiency along with productivity.

Capron was preferred by four-fifth of the men farmers (80.0%) whereas women farmers did not prefer it much. They preferred conventional method of tying their *dupatta* in a way that served the purpose of capron. The younger women or the girls preferred to use it. Men farmers used this technology successfully during threshing.

Gloves Harvesting of guar as well as cotton picking injured the fingers & hands of the workers. Hence, gloves when introduced, only one third of men (33.3%) & 26.7 percent of women farmers preferred using gloves while harvesting of guar & picking of cotton.

In nutshell, introduction of technology intervention package did make a dent upon the psyche of the farmers. It seems to be a good initiative towards reduction of drudgery and increasing work efficiency of the worker. Hence, it can go a long way with tireless efforts in improving quality of life of rural people in general and farm women, in particular.

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