



## Impact assessment of gender friendly drudgery reducing technologies

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### Abstract

The main source of livelihood for majority of the population in India is agriculture. Due to lack of access to improved technologies, agriculture has been established as one of the drudgery prone occupation of unorganized sector. The present study was planned to assess the impact of drudgery reducing technologies in agriculture. 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 women. An intervention package consisting of improved sickle, uprooter, cutter, revolving pihri, clod breaker, weeder, dung plaster (wiper) and slashing knife was introduced in villages Sidhpur Sarkari, Rani Sidhpur, Banuri and Panapar. 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 female respondents selected randomly from the given villages. Both pretest and posttest of Gain in knowledge and change in awareness level were calculated. Evaluation of field validation of technology on drudgery of women was done after its use in the field conditions. The findings revealed that the farm women were not aware of the drudgery reducing technologies earlier, but after imparting training and demonstrations, their awareness level of the various drudgery reducing technologies increased significantly. The results were found to be significant at 5% level of significance. The overall gain in awareness and knowledge of farm women was 13.29\*\* out of a maximum score of 22 and 44 respectively on drudgery reducing technology. The results showed significant differences in pre and posttest awareness level on selected respondents 't' value = 3.92\*\* and 4.56\*\* (significant at 5% level) and knowledge level 't' value = 4.81\*\* and 3.88\*\* (significant at 5% level).

**Key words:** clod breaker, technologies, Indian economy

### Introduction

Agriculture is the backbone of Indian economy and contribution of women is considerable as agricultural operations are predominantly carried out by women. On the other hand women tend to be disproportionately vulnerable to the quantitative and qualitative impact of technological change because newly

developed technologies are rarely targeted/designed specifically for women's needs as research organizations and production units consider men as the main farmers. It becomes imperative to give priority for technological empowerment of farm women. Due to feminization of Indian agriculture, men are pulled away in lucrative jobs.



Tools and technologies generated based on principles of ergonomics can bridge the gap between heavy workload causing poor health, illness and drudgery, appropriate tools enhance better health, efficiency, productivity and reduced drudgery. Thus, there is a need to equip farm women with ergonomically sound drudgery reducing technologies.

It is often reported that available gender friendly improved tools, implements and technologies related to agriculture are not readily adopted by the farm families. The underlying reason being that technologies are not in the reach of the target group. The unavailability of technologies in near vicinity, its high cost and lack of knowledge and skills in the use of such technology is the major hindrance in adoption. Necessary skill and management training needs to be imparted to workers at places where they can conveniently learn the managerial skills and handling of tools preferable by farm women and officials if any.

This will aim at bringing a planned change process in agricultural system through technological improvement keeping in view that women are the main farmers in terms of appropriate production output, increased efficiency, output reduced drudgery in overall quality and life of farm women.

Hence, the present investigation aims to generate awareness and knowledge of farm women through capacity building regarding trainings on gender friendly appropriate tools and technologies and to assess the performance evaluation of conventional versus improved tools and its impact in terms of selected parameters of drudgery reduction.

## Methodology

**Locale:** The study was conducted in the hill state of India viz. Himachal Pradesh on a 60 sample of predominant women farmers. The study was focused in four villages i.e. (1) Sidhpur Sarkari; (2) Rani Sidhpur; (3) Banuri and (4) Panapar of District Kangra, Himachal Pradesh, India.

A resource centre was created in a hired building along with an identified and elected women group leader in all the four villages. All improved tested gender friendly technologies were kept there to be used by farm women by hiring these tools on rotation basis for use. However, the present paper is delimited to a selective sample.

In phase I under Impact assessment 75 capacity building training camps were organized in selected villages to ascertain different levels in the awareness and knowledge of farm women regarding improved harvesting technologies both before and after imparting the trainings. Capacity building trainings were imparted to 300 proportionate representative women farmers amongst four villages with a total population of 450 women farmers.

The reliable and validated statements on awareness - 2 (Identification of tool along with its name; the correct purpose of the tool) and knowledge - 4 (technology features; cost; place of availability and procurement through Government schemes) were formulated to elicit information from the farm women before and after imparting the trainings.

Data were gathered on pre-structured interview schedule on 30 representative



women of five villages under focused group study and scores were awarded.

In phase II, the harvesting technologies selected for impact analysis included improved sickle, uprooter, cutter, revolving pihri, clod breaker, weeder, dung plaster (wiper) and slashing knife. Capacity building through demonstrations and skill by hands on practice was done by giving the tools to the farm women. The technologies were assessed for their impact on selected parameters viz. work area (sq.mt.); output (per hour); perceived satisfaction (scores); drudgery and health disorders (scores) experienced; labour employed; economic benefit / season; preference towards improved technology.

## Results and Discussion

### Capacity building training programmes

Training programmes for different groups of women beneficiaries for their empowerment was organized with the objectives of imparting knowledge and skill of improved farm tools, along with gaining confidence of farm women towards their participation in sustainable development of other aspects. Lectures on scientific work simplification techniques suitable for hill farmer women were delivered along with participatory interaction on existing tools and work methods for agricultural and allied tasks were taken up. Slide shows on impact of traditional versus improved method of doing work and different types of work postures were also shown depicting the level of postural discomfort. In order to increase the number of beneficiaries demonstrations were also given to groups who visited the university during Krishi Mahotsavas and Kissan

Melas organized from time to time. According to Jyotsana et.al. (2005) periodic training programmes should be organized to emphasize on educating workers regarding recognition of musculo-skeletal disorders and importance of rest pauses and maintaining proper posture while performing agricultural activities.

### I Impact assessment of capacity building trainings

The investigation elicited that farm women spent most of their time in activities which were non mechanized and involved drudgery while mechanization has been the domain of men. Pre and Post test on awareness and knowledge related to 30 women friendly technologies was conducted before and after capacity building trainings of participants. An improvement was observed in the awareness and knowledge status among respondents.

Results of pre test score of village 1 and village 2 as given in table 1 was found to be  $0.89 \pm 0.77$  and  $1.15 \pm 1.00$ . The perusal of data further indicated that the 1<sup>st</sup> post test trials given in the same villages showed a score of  $1.88 \pm 0.19$  and  $2.75 \pm 1.80$  respectively. Student t test was applied to further analyze the data. The findings revealed that the farm women were not aware of the drudgery reducing technologies earlier, but after imparting training and demonstrations, their awareness level of the various drudgery reducing technologies increased significantly. The results were found to be significant at 5 % level of significance. Pre testing of the same was done in village 3 and 4 also. Results indicated that pre test score were  $0.89 \pm 0.68$  and  $1.53 \pm 0.91$  for villages 3 and 4. The post test 1 trials conducted in the same



villages showed scores as  $2.10 \pm 0.12$  and  $2.02 \pm 0.41$  respectively. The 2<sup>nd</sup> post test trials were given in all the four adopted villages. The results compiled showed a score of  $1.96 \pm 0.62$ ,  $2.94 \pm 1.81$ ,  $2.36 \pm 1.01$  and  $2.38 \pm 0.98$  for villages 1, 2, 3 and 4 respectively. The analysis of data statistically showed significant results in three villages. Posttest 3 trials were conducted only in the first village and the results showed statistically significant results.

The overall gain in awareness and knowledge of farm women was  $13.29^{**}$  out of a maximum score of 22 and 44 respectively on drudgery reducing technology.

The data were further statistically analyzed which elicited significant differences in pre and posttest in awareness and knowledge level of respondents regarding improved technologies by employing 't' test. The results showed significant differences in pre and posttest awareness level on selected respondents 't' value =  $3.92^{**}$  and  $4.56^{**}$  (significant at 5% level) and knowledge level 't' value =  $4.81^{**}$  and  $3.88^{**}$  (significant at 5% level).

## II Impact assessment of gender friendly reducing harvesting technologies

The data were collected on 30 number of women respondents from the selected focused village group. The improved harvesting technologies selected for impact analysis included improved sickle, cutter and uprooter. The performance evaluation of each selected tool included drudgery prone tasks, name of the crop, no. of users and season. Detailed description and specifications of conventional and improved tool was ascertained in terms of weight, purpose of

use, pulling force, handle grips, material used etc.

### Performance evaluation of technology on Field Validation

An increase in the work done per unit time was observed while working with the improved tool (326.36 sq.ft) over the existing one (248.44 sq.ft). 15% percent increase was observed in the output of the harvest while 6 percent decrease was observed in the drudgery score.

Table 2 highlights the performance evaluation of the improved tool as compared with the conventional tool. Improved sickle was more suitable for crop harvesting by farm women and their preference was shown towards improved sickle as compared to the sickles traditionally used by them (Mishra et.al, 2013). The output was increased with better harvesting efficiency and reduced drudgery by using improved sickle. Improved sickle is within the reach of common man may it be locally made or branded company made. Thus, improved (serrated) sickle is found suitable for harvesting of crop. Due to its less weight i.e. about 180 gram, the fatigue coming on wrist is less and the drudgery involved in harvesting is reduced as compared to local sickles which are heavier i.e. weighing about 359 gram (Singh et. al. 2007).

Wrapping up it can be said that farm women are still not much aware about the various new/ improved drudgery reducing technologies. Thus, training and demonstrations need to be imparted time and again to motivate and make them aware of their use and features. So, it is



necessary to reduce the work load and drudgery of all other activities too and alleviate the occupational health hazards which symbolizes ease and efficiency and quality life for which all technological knowledge and knowledge for capacity building of human resources is imperative. Cent percent farm women liked the revolving pihri and serrated sickle. Majority of the respondents preferred the clod breaker, weeder, dung plaster (wiper), grain spreader and slashing knife.

- Reeta Mishra, Y.P. Singh<sup>1</sup>, Y.D. Mishra<sup>2</sup>, Swati Singh<sup>1</sup> and Harvendra Singh. (2013) Dissemination of Improved Sickles for Female Agriculture Workers for Crop Harvesting. *TECHNOFAME- A Journal of Multidisciplinary Advance Research* Vol.2 No. 1, 118-123

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Figure 1: Demonstration on drudgery reducing tools





Table1: Awareness level and knowledge level of farm women regarding the drudgery reducing tools

Details	Awareness Level	Knowledge level	Awareness Level	Knowledge level
	Village 1		Village 2	
No. of subjects	30 women	30 Women	30 Women	30 Women
No. of technologies	11	11	11	11
score maximum	22	44	22	44
Pretest score & SD	0.89+/-0.77	1.789 ±1.21	1.15 ± 1.00	1.789 ±1.21
Post test- 1 score & SD	1.88+/-0.19	3.251 ±1.84	2.75 ±1.80	3.251 ±1.84
Post test- 2 score & SD	1.96+/-0.62	5.01±1.02	2.94±1.81	5.01±1.02
Post test- 3 score & SD	2	-	-	-
T1@ 5% level	4.34	3.61*	3.92*	3.61*
T2@ 5% level	4.92*	4.81**	4.61*	4.81**
T3@ 5% level	13.29**	-	-	-

Table 2: Performance evaluation of technology improved sickle as compared to a conventional sickle

Parameters for observation	Conventional Sickle	Improved sickle	% Change due to technology
Technology performance			
Human power used *	4	5	
Work done/ unit time (20 min.)	248.44 sq.ft	326.36 sq.ft	77.92
Output (kg)	20	35	15
Drudgery score (30 Max) ( see table -2)	23	17	6
Disorders score ( see table – 3 )	Upper arm – 32 Upper back –33 Lower legs -15	Upper arm – 19 Upper back – 24 Lower legs - 10	
Preference on technology ( table -4)	-		
Labor employed / acre	-	-	-
Labor wages	-	-	-
Economic benefit	-	-	-
Cardiac Strain Index	5.67	3.60	-

\* Highly satisfied -5; Satisfied -4; fairly satisfied -3; Dissatisfied -2; Highly dissatisfied -1