



Management of Natural Resources by using Women Friendly Farm Equipments

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ABSTRACT

Agriculture is a backbone of Indian economy and about 70 per cent population is dependent upon agricultural sector and farm women contributes about 55-65 per cent in performing various agricultural operations and other activities. These farm women are doing arduous field operations along with household chores and mostly using traditional hand tools and gadgets. These tools are not only the source of drudgery but also a major cause of low efficiency in farm women and reduce the farm outputs. Hence, the emphasis was given to reduce the drudgery among farm women by introducing the women friendly farm equipments, which are specially designed for them. These farm equipments help in reducing drudgery, increasing efficiency of farm women and saving time. The equipments like improved sickle, weeder, maize sheller and hand drawn trolley were tested by Krishi Vigyan Kendra , Ujjain in a cluster of villages. It was found that all the women friendly equipments were able to reducing drudgery from 35-67 per cent and also saved the time near about 3-4 hr / day. The perceived exertion was reduced by 1 to 2 on five point scale.

Key Words: Drudgery Index, Farm Women, Rate of Perceived Exertion

INTRODUCTION

The rural women are extensively involved in agricultural activities and moreover, farm women are doing arduous field operations along with household chores, mostly using traditional equipments/ tools which are not only the source of drudgery but also a major cause of low efficiency and output. The drudgery is generally perceived as physical and mental strain, agony and monotony and hardship experienced by human being. The various farm activities in which the drudgery is involved are sowing, manually uprooting, weeding, harvesting, winnowing, de-husking, shelling, pounding, grinding of cereals and pulses by manual method, cutting, collecting and carrying fuel/ fodder over long distance and excessive physical work in care and management, harvesting, threshing, processing and marketing etc. Hence, long hours of work put in by women fulfilling their multiple roles hardly leave any time for leisure which ultimately gives

ill effect on their both mental and physical and almost all farm women suffer physical drudgery during different operations in agriculture Sadangi *et al* (2006). Study on rice farming revealed that transplanting, threshing, parboiling are the heavy activities whereas weeding, cutting and carrying were the moderately heavy activities (Anon. 2004).

Therefore, the present study was conducted to assess the personal characteristics of the farm women, drudgery involved in the selected farm activities, the perceived exertion while performing the farm activities, to evaluate the body discomfort while performing the selected farm activities and to assess the feedback regarding new technologies.

MATERIALS AND METHODS

The study was conducted in 7 villages as a cluster namely Akasoda, Buchakhedi, Dewrakhedi, Azampura, Jalalkhedi, Malikhedi and Salakhedi. Durng kharif and rabi seasons of the year 2016,

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sixty eight farm women were selected randomly and for each selected activity 17 farm women were also identified. The purposively farm women below 40 yr were selected. The on farm trials (OFT) followed by front line demonstrations (FLD) were conducted for reducing the drudgery involved in the selected farm activities. A comparative study was carried out between existing practices and improved technologies used for reducing the drudgery involved in the farm activities. A well designed proforma was used for assessing the drudgery involved in the selected farm activities. A special attention was given on the selected sample size with regards to their physical fitness and ensuring that none had any health hazard.

Selected farm activities and advance technologies

Four drudgery prone farm activities which were exclusively performed by the farm women were selected for the study. Those were weeding in soybean crop, shelling of maize, crop (wheat) harvesting and lifting/ carrying harvested crop on head /hand. For those selected farm activities specially designed and advanced women friendly equipments/ tools were used like twin wheel hand hoe weeder for weeding, tubular maize sheller for shelling maize, naveen sickle for harvesting wheat and manual hand drawn trolley for lifting/ carrying harvested crop.

Description of Technologies

Twin Wheel Hand Hoe Weeder: It avoids bending postures that is generally adopted in traditional method. Productivity of works increased more than three times with the equipment than traditional.

Tubular Maize Sheller: The work efficiency is very high with very low efforts in tubular maize sheller. It reduces the ergonomic cost on selected parameters and grip fatigue over the traditional method.

Naveen Sickle: Serrated sickles did not require the sharpening of cutting edge frequently apart from its

proper gripping over crops. It also provides safety to the workers. Light weight sickle reduces all the parameters on ergonomic cost to a significant level. Hence, it reduces the drudgery and enhances the work efficiency of the users.

Manual Hand Drawn Trolley: Refined trolley with larger wheel diameter was designed and developed by the KVK, Ujjain. In this slight modification was made by increasing the base and diameter of the wheel, size and inclination angle of handle and its height was adjusted to suit women of different height, based upon the feedback received by the farm women to suit to their convenience and simply the work demand less energy. The base of trolley was provided with small perforation to facilitate its use in carrying and pre-cleaning the horticulture crops before marketing and thus making it suitable for wider adaptability.

Questionnaire: A specially designed and well planned questionnaire was prepared for assessing the data regarding the selected farm activities viz., time, degree of difficulty, frequency of performance, rate of perceived exertion (RPE) and muscular problem as well as the output. The feedback was also noticed for the more refinement in the technology.

Factors influencing drudgery:

Degree of Difficulty: Degree of Difficulty was measured on five point scale ranging from very easy to very difficulty.

Time: One hr. (60 minutes) observations were made in all the practices for assessing and for comparing the data.

Frequency: Frequency of performance was measured on five point scale varies from daily to seasonally. Evaluation of Drudgery:

Drudgery Index: Drudgery Index was measured by using following formula

$$X + Y + Z / 3 \times 100$$

Where, X is Co-efficient of Frequency; Y, Co-efficient of difficulty and Z, co-efficient of time.

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Table 1. General profile and social background of the farm women (N=68).

Parameter	Detail	Number of respondents	Per cent
Age (yr.)	20- 25	07	10.29
	26-30	12	17.64
	31-35	28	41.17
	>35	21	30.88
Weight (kg)	35-40	08	11.76
	41-45	35	51.47
	46-50	23	33.82
	>50	02	02.94
Type of family	Nuclear	49	72.05
	Joint	19	27.94
Number family of members	1-3	07	75.00
	4-6	51	10.29
	>7	10	14.70
Type of house	Kachha	15	22.05
	Semi Pakka	32	47.05
	Pakka	21	30.88

RPE: Rate of perceived exertion was measured on five point scale ranging from very easy to very difficult.

Muscular Pain: The Incidence of muscular-skeletal problems of the selected subjects was identified by using the body map. After completing the activity incidence of body pain at body parts viz., upper and lower extremities were recorded on five point scale i.e. very severe to very light.

Feed Back: Feed back of the technology was received after completing the activity. After using the advanced equipments/tools a simple questions were asked to the selected farm women regarding the advanced technologies.

RESULTS AND DISCUSSION

The data (Table 1) showed that maximum (41.17%) women belong to the age group of 31-35 yr followed by 30.88 per cent more than 35 yr age where as only 10.29 per cent were between 20-25 yr age group. In case of weight, it was evident that

malnutrition problem existed in the rural women i.e. weight of 35 farm women was between 41-45 kg, only 02 respondents up to 50kg and 08 women in malnutrition category (35-40kg).

The existing family system revealed that urbanisation pattern was quickly adopted by the rural masses i.e. only 19 (27.94 %) respondents belonged to joint family whereas 49 (72.05%) adopted nuclear family system. Maximum (47.05%) number of respondents lived in semi concrete houses followed by 30.88 per cent in concrete house and only 22.05 per cent lived in kachha house.

A comparison between improved and existing method (Table 2) revealed that advanced technologies were better than existing practices. The study was conducted for 60 minutes in both methods simultaneously on 17 farm women for each selected farm activities. Degree of difficulty, perceived exertion and frequency of performance, area covered and drudgery index were calculated. It was observed in the weeding operation that 41

Table 2. Comparison between advanced technologies and existing practices.

Farm Activity	Weeding		Shelling Maize		Harvesting of Wheat		Carrying harvested crop	
	Existing	Improved	Existing	Improved	Existing	Improved	Existing	Improved
Parameter	Local weeder	Twin wheel hand hoe weeder	Hand practice	Tubular Maize Sheller	Local Sickle	Naveen Sickle	Manual lifting on head / in hand	Manual Hand Drawn Trolley
Drudgery Index	98.66	70.66	90.1	73.2	82.1	61.02	68.16	40.8
Perceived Exertion	4.6	2.8	3.2	2.6	4.8	2.4	3.4	2.4
Area Covered m ² / output in kg	97	138	22	50	102	147	290	1752
Time (minutes)	60	60	60	60	60	60	60	60
Degree of Difficulty	4.8	2.0	4.6	2.2	4.6	2.8	4.8	2.1

sq m area was covered more compared to existing practice with the help of twin wheel hand hoe weeder. Degree of difficulty (4.8) and perceived exertion (4.6) were more in existing practice as compared to improved practice. After studying the frequency of performance, degree of difficulty and time required for the activity drudgery index was calculated and the result showed that 98.66 per cent drudgery involved in existing practice (Local weeder) and 70.66 per cent in improved technology (Twin wheel hand hoe weeder). In case of shelling maize, it was observed that 17 percent drudgery reduced by using the tubular maize shelling and output was 50 kg /hr. The result of harvesting of wheat by Naveen sickle was also indicative that advanced technology reduced the drudgery by 21.08 units and degree of difficulty and perceived exertion was minimum compared to existing practice. Improved technology not only reduced the drudgery involved in the field activity but also increased the work efficiency in terms of output. In manual lifting, the harvested crop in hands or on head, the farm women were to carry only 290 kg/hr in comparison to 1752 kg/hr carried by using trolley in a very comfortable manner. The drudgery involved was also minimum (40.8%) compared to existing method (68.16%). Hence, it also indicated that women friendly farm tools minimizes maximum problems of the farm women but these equipments are not popular in rural area because the new techniques or technologies have not yet reached at bottom level particularly in rural areas.

Body Muscular Pain

The results (Table 3) show that the advanced technologies which were introduced to the farm women in all the selected farm activities reduced the body discomforts in all the respect. The body discomfort was measured on five point scale ranging from very mild to very severe. In the weeding operation cervical and lumbar points were more affected in existing practice whereas it reduced in advance technology. In case of maize shelling operation, no headache problem was noticed in the recommended practice whereas it ranged between

Table 3. Body Muscular Pain in Selected farm activities.

Sr. No.	Body Part	Weeding		Shelling Maize		Harvesting crop		Carrying harvested crop	
		FP	RP	FP	RP	FP	RP	FP	RP
1	Head	4.6 (3-5)	2.6 (1-3)	3.6 (2-5)	0	3.5 (2-5)	1.1 (1-2)	3.5 (2-5)	2.3 (2-3)
2	Elbow Joint	3.6 (2-4)	1.8 (1-3)	4.6 (3-5)	1.1 (1-2)	3.8 (3-5)	2.8 (2-3)	4.0 (3-5)	2.8 (2-4)
3	Wrist	4.5 (2-5)	1.6 (1-3)	4.8 (2-5)	3.8 (2-4)	4.8 (4-5)	2.9 (2-4)	4.2 (3-5)	2.7 (2-4)
4	Fingers/ palm	4.5 (3-5)	2.1 (1-3)	3.9 (1-5)	2.3 (1-3)	4.5 (3-5)	2.1 (1-3)	4.8 (4-5)	2.9 (2-4)
5	Cervical point	5 (5)	1.2 (1-2)	4.2 (2-5)	1.2 (1-2)	4.8 (3-5)	3.1 (2-4)	4.4 (3-5)	2.7 (2-4)
6	Lumbar point	5(5)	2.1 (1-3)	4.4 (2-5)	1.8 (1-3)	4.9 (3-5)	3.2 (2-4)	4.1 (3-5)	2.5 (2-3)
7	Thigh Muscles	4.8 (3-5)	1.1 (1-2)	3.8 (2-5)	2.0 (1-3)	4.6 (2-5)	2.8 (1-3)	3.5 (2-5)	2.2 (2-3)
8	Leg / Knee Joint	4.6 (3-5)	2.2 (1-3)	3.8 (2-5)	1.8 (1-3)	3.6 (3-5)	2.2 (2-3)	3.8 (3-5)	2.2 (2-3)
9	Feet/ Ankle joint	4.2 (3-5)	1.6 (1-2)	2.9 (1-3)	1.6 (1-2)	2.9 (2-4)	1.5 (1-3)	4.03 (3-5)	2.5 (2-4)

Figures in parenthesis indicate range. FP- Farmers Practice RP-Recommended Practice

2 to 5 under the farmer's practice. The results indicated that muscular problems were minimised in advanced technologies and provides comfort and saves time as well as reduces drudgery.

Feedback

The farm women highly appreciated the women friendly tools/ equipments which were specially designed/ fabricated for farm women to reduce the drudgery involved in the activity and for better output in minimum time and energy. The adverse comment regarding Naveen Sickle was noted i.e. the left handed people were unable to operate the sickle due to the specially designed handle. It requires certain modification so the left handed person also able to adopt the new technology.

CONCLUSION

It was concluded that women friendly tools/ equipments reduces the drudgery in the farm women, saves time and provide maximum output. It reduced the body discomfort also and minimises difficulty involved in carrying out the activity. For the growth of agriculture in rural sector, women are equally vital and therefore, it is important to empower them with necessary knowledge and skills in both technical and managerial aspects, irrespective of gender. The concerns and needs of farm women are the integral part of the design, implementation, monitoring and evaluation of policies and programmes for technology transfer and its wider adoption.

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