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Ergonomic Evaluation and Economics of Improved Harvesting Technology for Farm Women in Odisha

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ABSTRACT

Many agricultural tasks demand high level of strenuous activity. Investment to improve agricultural worker's (Farmer and farm women) health would be justified on both humanitarian and economic ground. It is also quite true that maximum farm activities were carried out by farm women and these activities not only demands maximum physi-ological workload as well as energy expenditure also due to the highly drudgery involved in certain farm activities which ultimately leads to health problems and also ill effect on efficiency which reduce output of the activities. It causes considerable physical and mental fatigue and other health problem. The root cause of their suffering is ignorance about improved technologies, age-old method of doing the work. Hence, a study was conducted to assess ergonomically the efficiency of improved technology –Naveen Sickle for harvesting of wheat crop. Forty farm women were selected from adopted cluster area of Odisha (perticularly North Odisha) to assess and compare the impact of improved technology over conventional one. Drudgery index, RPE, degree of difficulty, muscular skeletal problems, efficiency and output, etc. were the main parameter of conducted study. Studies have pointed out that farm activities are time and labour intensive, monotonous, repetitive and more drudgery prone are generally performed by women. The result shows that improved method not only reduces drudgery by 28 per cent involved in the activity but also saves energy and time as well as minimizes muscular skeletal problems also. The work output was also found higher 138 m2 area with improved technology as compare to conventional method. In this way re-sults indicates that this method is useful to the farmers as well as to the particular labour also. Additional 286.7 m2 area covered per day and saves Rs. 506/ha. by the farmer. Farm women completed the work faster and saved nearly 3 hr. /day which can be utilised for another work. In terms of money calculated she could earn additional income Rs. 1450/month due to additional area covered per day.

Keywords: Drudgery, efficiency, muscular problem, farm women, technology, ergonomic.

2.1 INTRODUCTION

Women in India are the major work force in agriculture and perform almost all the agricultural activities. In India, out of 30 million women work force, 20 million live in rural areas. The rural women play a significant role in agriculture and other agro based activities. The daily work schedule of rural women is very demanding and arduous as per Suma Hasalkar et al. (2005). It is estimated that during peak period, women work every day for about 8-9 hours in agriculture and 4 hours in household activities and there are certain agricultural operations in which female agricultural workers are considered better than male workers as studied by Bhopl and Pattai (1998). Women carry-out many jobs as weeding, transplanting, harvesting, threshing and storing grains, tending animals and providing fuel and water etc. These tasks often have serious consequences for women due to the uncomfortable technologies of performance. A study conducted on farm women by Bibhu et al. (2005) stated that during wheat harvesting activity

2.3.6 Time

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

2.3.7 RPE

Perceived exertion was measured on five point scale ranging from very easy to very difficulty.

2.3.8 Drudgery Index

It was measured by using fallowing formula: $X + Y + Z * 100/3$

2.3.9 Improved Technology

Especially designed farm tool for harvesting of wheat – Naveen Sickle (source CIAE 1998) was used for the study. It was compared with the Naveen practice Sickle (local-sickle).

2.3.10 Specific Features of Tools

Light in weight, serrated blade, economical, easy to handle, covers more area, more suitable to wheat crop, vegetables and green fodder, etc., specially designed handle cuts the crop from bottom level, saves time, women friendly farm tool

Table 2.1: General profile and social background of the farm women

Parameters	*Respondent*	*%age*
26.0 (20-35) 35<	24	60
	12	30
1 – 45 (45-50) 50<	26	65
	04	10
Joint family	12	65
No. of Members		
4-5	8	45
7<	12	30

Table 2.2: Types of houses of women farmers

Types of Houses	*Families*	*%age*
Semipakka	8	45
Pakka	10	25

Data in Tables 2.1 and 2.2 pertaining to the assessment of total profile and social background of the farm women was depicted work being accomplished and the effect of earning per labour in Table 2.1. It was observed that 60 per cent farm women and saving to the farmer who employs the labours for harvest were belongs to 26-30 years age group and 30 per cent wereing, clearly indicates the effectiveness of improved sickle over in the 31-35 years age group where as only 10 per cent were the existing traditional sickle. On one hand it is evident that ain the 20-25 years age group. In case of weight also maximum labour covers an additional area of 91.9 m per day and thus the farm women's were dwelt in the 41-45 kg weight (65%), 25 quite less number of days to cover one hectare area but on the per cent were under the malnourished category and only 10 per contrary the same labour covers an additional area of 0.86 ha cent were in the normal weight, i.e. 10 per cent. In the table it per month which ultimately results in an additional income of was observed that nuclear family system was more common in Rs 1450. Similarly, for the farmer who employs the labour for the rural areas also (70%) as compare to joint family system harvesting is also at a benefit because his work gets done faster (30%). In the rural area type of house was also a status symbol and thus he too saves Rs 507 per hectare. Thus, the technology as result shows 25 per cent families were living in Pukka house is farmer as well as labour friendly in all aspects of work and whereas 45 per cent were living in semi pakka house and onlyeconomics. 30 per cent were living in kachha house.

Table 2.3: Feedback of the farm women regarding existing and improved technology

Existing Tool	*Improved Tool*
Heavy to handle	Light weighted, Easy to handle, Economical
Frequently sharpness of blade is required	Frequent sharpness of blade is not required and it can cuts the crop from bottom level
Maximum stress is required on hand muscles	Less stress on hand muscles etc.
Squatting posture is required for long period leads to Leg muscles problems.	Squatting is required for less period
Limitations & Constrains: Poor Output at the end of day Covers less area Produces Health Hazards Limitations and Constrains:	**Coves more area:** Saves time and money Practice is required Useless for left hand persons Not easily available in the market

Table 2.4: Showing results of income generated by traditional & improved sickle

Results	*Area Covered/ day/m2*	*Required/ hectare*	*Area/ covered/ Daily*	*Additional area covered/month Month /Hectare*	*Total area covered*	*Daily wages/ Total area covered/ month*	*Additional Income/month*	*Total additional Income enerated*
Traditional Sickle result	More	1 ha	91.9 meter/day	Nil	92.76	Rs. 680/hectare	Nil	Nil
Improved Sickle results	Less	1 ha 92.76	91.9 meter/day	0.86ha/month			Rs. 507/Ha	Rs. 1450/month

2.4 ECONOMICS OF IMPROVED TECHNOLOGY

Data in Table 2.4 pertaining to the assessment of total work being accomplished and the effect of earning per labour and saving to the farmer who employs the labours for harvesting, clearly indicates the effectiveness of improved sickle over the existing traditional sickle. On one hand it is evident that a labour covers an additional area of 91.9 m per day and thus requires less number of days to cover one hectare area but on the contrary the same labour covers an additional area of 0.86 ha per month which ultimately results in an additional income of Rs 1450. Similarly, for the farmer who employs the labour for harvesting is also at a benefit because his work gets done faster and thus he too saves Rs 507 per hectare. Thus the technology is farmer as well as labour friendly in all aspects of work and economics.

2.5 EQUATIONS

Drudgery Index:

It was measured by using fallowing formula: $X + Y + Z * 100/3$

2.6 RESULTS AND DISCUSSION

In Keonjhar reason wheat and gram is the main rabi crop. Harvesting of the crop is done manually and this is exclusively carried out by farm women. In the OFF and ON campus training programmes it emerged during the discussion that harvesting of the crop was more exerting, time consuming and due to the squatting posture maximum muscular pain in the body was improved practice (Naveen Sickle). It means near about 28 per cent drudgery could be reduced in improved practice. Reducing of drudgery it indicate that improved practice saves time, gives more output and it reduces body muscular skeletal problems also. It also indicate that women friendly farm tools minimizes maximum problems of the farm women but these equipment are not popular in rural area because the new techniques or technologies' are still not reached at bottom level particularly at rural area.After completing the study in general discussion was conducted with the farm women for receiving the feedback regarding the improved method (Naveen sickle) and existing practice (local sickle) is depicted in Table 2.3. Based on the experience and feedback of the farm women it was crystal clear that Naveen sickle is quite better than local sickle. Local sickle is

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