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**Performance assessment of improved sickle and
tubular maize Sheller in context of drudgery of
farm women**

Veena Shahi, Brajesh Shahi and Vikas Kumar

Abstract

The study was planned to reduce the drudgery of farm women by introducing improved sickle and tubular maize sheller for weeding and maize shelling, respectively and was conducted in different blocks of Vaishali district of Bihar on 100 farmers and farm women. The results indicated that the performance of improved sickle was very good and found to be very much accepted by farm women due to its serrated sharp end and less effort for pulling during weeding. Maize sheller was found much better than farmers practices in shelling efficiency (98% vs 87%), labour requirement (5 vs 8 man-hr. /q), shelling capacity (18 vs 9 kg/ h) and damage/ broken grains (1% vs 21%). Majority of farmers perceived that the tubular maize sheller was very much convenient to operate (98%), didn't require special training (100%), more shelling efficiency over existing practices (100%) with less damage of grains during shelling (98%), and less time and energy was required during shelling (100%). Thus, tubular maize sheller was found much better than their local practices in shelling efficiency, less labour requirement and less broken grains. It has also reduced the health hazards like hand pain, shoulder pain, backache and waist pain in majority of the respondents. Majority of the farm women perceived the improved sickle and tubular maize sheller as most reasonable technology.

Keywords: Drudgery, Farm women, Improved Sickle, Maize Sheller

Introduction

Agriculture is a primary unorganized sector in which women perform the majority of the drudgery prone work (Rani, 2007) [4]. Women as farmer or farm workers, participate in various farm activities such as seeding, thinning, transplanting, weeding, fertilizer application, plant protection, harvesting, threshing, winnowing, processing, etc. (Mukherjee, 2014) [2]. While performing these activities, the women work continuously in difficult situations and postures. Consequently, women are increasing their workload which causes significant physical, mental exhaustion which lead to drudgery (Agarwal, 2007) [1]. So, availability of women friendly tools is required to carry out farm activities efficiently and without much drudgery. In present context the design of old technology is to modify which will be helpful for farm women in reducing their drudgery and increase work efficiency.

The women are employed in the various operations which are either not mechanized or least mechanized and involve a lot of drudgery (Singh *et al.*, 2010) [7]. Scientific and technological inputs and interventions are thus required in agriculture to relieve farm women from the physical and mental strain (Singh *et al.*, 2008) [6]. Women-friendly improved implements and tools need to be developed, refined and evaluated based on feedback of the farm women.

Keeping these points in view this study was framed to understand the perception of farm women on drudgery reducing agricultural tools and to assess the acceptability of these improved drudgery reduction tools by women.

Methodology

The study was conducted in different blocks of Vaishali district of Bihar with farm women/farmers in adopted villages under OFT and FLD programme during 2007-09 & 2015-17 to evaluate the performance and to know the dissemination and adoption in the operational area. Initially an exhaustive list of 100 farmers (50 farmers for each tool) was prepared by conducting ex-trainees meet, group discussion and face to face interview with local leaders and women engaged in agricultural operation. In this study different agricultural tools viz., Improved Sickle and Tubular Maize Sheller developed by CIAE Bhopal was assessed for reduced drudgery among farmers. Improved sickle is the light weight hand operated, non-corrosive, saw-toothed and sharp instrument that requires less energy to cut and remove weeds from the fields. Tubular maize sheller is specially designed to remove maize from the mature dried cobs. Use of sheller facilitates shelling of quality maize within short time without damage.

For evaluation of reduced drudgery and acceptability, and to assess perception of farmers regarding the efficiency of improved sickle and maize sheller, a structured interview schedule was developed by framing 10 statements concerning

to each of the two agricultural tools. The data were tabulated and statistically analyzed using frequency and percentages.

Results and Discussion

Perception of farm women towards improved sickle

Perception of farmers towards efficiency of improved sickle was evaluated by KVK Vaishali in 2015-17 through conduction of FLD to know whether it really helped the farmers for reduced drudgery during weeding operations or not. All the beneficiaries stated that the curvature of the sickle was supportive in escaping regular striking of the fingers to the hard surface of the soil. The serrated sharp ends made it possible to cut the stems of the weed plants easily with low energy which did not need appropriate training for weeding operation. Majority of them indicated that the implement was cheap, easy to operate, less maintenance required and was women friendly. More than ninety per cent of the respondents observed that it lasted longer and there was no need to sharpen it frequently (Table 1). Results indicated that the performance of improved sickle was very good and found to be very much accepted by farm women due to its serrated sharp end and less effort for pulling during weeding. Similar result was also reported by Shivamurthy *et al.*, 2017^[5].

Table 1: Perception of farm women towards Improved Sickle over traditional sickle (n=50)

S. No	Statements	Response			
		Yes		No	
		Frequency	Percentage	Frequency	Percentage
1.	Avoid regular striking of the fingers to the hard surface of the field	47	94	03	6.0
2.	Blade is made up of steel and got sharpen so no need of sharpening the edge frequently	45	90	05	10
3.	More straw and weed can be removed in comparison to traditional sickle	41	82	09	8.0
4.	Save time and energy	48	96	02	4.0
5.	More area can be covered within less time	48	96	02	4.0
6.	No special training is required for operation of tool	50	100	0	0.0
7.	Women-friendly	50	100	0	0.0
8.	Cost of tool is cheap	47	94	03	6.0
9.	Very much convenient to operate	50	100	0	0.0
10.	No maintenance required	48	96	02	4.0

Performance of tubular maize sheller

After conduction OFT in year 2007-08 and 2008-09 at KVK Vaishali, data was collected to compare the performance of tubular maize sheller over farmers practices. The shelling efficiency of tubular maize sheller was 98% with only 1% seed breakage over farmers practice of stick beating or by sharp equipment with shelling efficiency 87% and seed breakage 21% (Table 2), which causes significant losses to the farmers. Sheller has also saved the 3 man-hours per q as compared to farmers practices. The shelling capacity of

sheller was found 25 kg / hr while shelling capacity by stick beating was only 18 kg / hr. Similarly, Pandey *et al.*, 2013^[3] also compared the shelling capacity of tubular maize sheller with the local practice of hand shelling and found that field capacity of sheller was 25.44 kg/hr as compared to hand shelling by which farm women could shell 16.83 kg/hr. Hence, tubular maize sheller was found more effective in saving time with better shelling efficiency and good quality grain compared to their old age practices.

Table 2: Performance of tubular maize sheller over farmers practices (N=50)

S. No.	Particulars	Tubular Maize Sheller	Farmers practices (finger tips or by sharp equipment)
1.	Shelling efficiency (%)	98	87
2.	Labor requirement (Man-hour/q)	05	08
3.	Shelling capacity (Kg/hour)	18	09
4.	Broken/damage grains (%)	01	21

Perception of farm women towards Maize Sheller

Perception of farmers towards efficiency of maize sheller was evaluated to know whether it really helped the farmers for reduced drudgery during shelling of dried cobs or not. Majority of farmers perceived that the maize sheller was very much convenient to operate (98%), didn't require special training (100%), more shelling efficiency over existing practices (100%) with less damage of grains during shelling (98%), and less time and energy was required during shelling (100%) (Table 3). Thus, use of maize sheller facilitated

shelling of more maize in short time without any significant damage as compared to their local practice of stick beating. All the farm women expressed that the use of maize sheller reduced drudgery because of it avoid straining of fingers and observed very less pain in hand and shoulder during continuous work. Results indicated that the perception of farmers towards maize sheller was very good and acceptable by farm women due to less stress of fingers during shelling of maize.

Table 3: Perception of farm women towards Maize Sheller over existing practices (n=50)

S. No	Statements	Response			
		Yes		No	
		Frequency	Percentage	Frequency	Percentage
1.	Very much convenient to operate	49	98	01	2.0
2.	No special training is required for operation of tool	50	100	00	0.0
3.	Avoid straining of fingers	47	94	03	6.0
4.	Cost of tool is cheap	46	92	04	8.0
5.	More shelling efficiency over existing practices	50	100	00	0.0
6.	Less damage of grains during shelling	49	98	01	2.0
7.	Less labour requirement	47	94	03	6.0
8.	Save time and energy	50	100	00	0.0
9.	No maintenance required	48	96	02	4.0
10.	Reduced drudgery (hand & shoulder pain, backache etc.)	50	100	00	0.0

Conclusion

Drudgery reducing tools are proved to be a boon for farm women. The farmers especially farm women perceived both tools as women friendly because of easy operation, time saving and needed less energy than their local practices. It can be concluded that improved sickle and maize sheller was found effective in reducing the drudgery of farm women. It is suggested here that other hand tools and farm implements should also be tested for reducing the drudgery of farm women and accepted tools should be made easily accessible for them.

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