

FARM IMPLEMENTS AND HAND TOOLS FOR REDUCING THE DRUDGERY OF FARMWOMEN IN BUNDLKHAND

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ABSTRACT

Most of the works performed by farmwomen are tedious as well as time consuming. Also many of these operations are traditionally done in varying body postures, which if done for long duration cause inconvenience and body pain. Hence, a study was conducted on testing and evaluation of five implements namely tubular maize sheller, sitting type ground nut decorticator, seed treatment drum, naveen sickle and ground nut stripper on thirty farmwomen in participatory mode to reduce their drudgery. The results indicated that the shelling efficiency of tubular maize sheller was 98% with 1% seed breakage as compared to their local practice of stick beating with 90% shelling efficiency and 10% seed breakage. It has reduced hand pain (80%), shoulder pain (70%), backache (73%) and waist pain (72%) caused by stick beating. The decortication capacity of sitting type ground nut decorticator was 30 kg / hour whereas by hand or teeth farm women were able to break only 1kg ground nuts per hour. Besides, its' shelling efficiency (95%) was also found more than their local practice (92%) and reduced finger pain (73%), hand pain (60%), backache (40%), tooth pain (66%) and` cuts in mouth (70%). The stripping efficiency of groundnut stripper was 90%, which was 10% more than their local practice of stripping with stick or stone. Its' Labour requirement (4 man days /q) was also lesser than their local practice (6 man days/ q). It has also reduced hand pain (80%), shoulder pain (77%) and waist pain (67%). The mixing efficiency of seed treatment drum (98%) was better than the mixing of chemicals with seeds directly by hands (80%) although it took 25 minutes/q which was 5% more than their local practice. It has reduced the redness and swelling in hands (83%) and itching in hands (63%) caused by mixing of seeds by hands. The labour requirement by using naveen sickle was 16 man days/ ha as against the harvesting by local sickle (21 man days/ ha). It has reduced cuts on fingers due to rubbing of hand in harvesting ground level crops (80%), Pain in wrist and hands (70%) and physical tiredness (73%) caused by their local sickle.

INTRODUCTION

Human (man and woman) plays great importance in agriculture system since agrarian, hence in the design of farm tools and equipment, everything known about the operator is very important as they have to work with the designed/developed equipment. It is reported that many agricultural projects aimed at men with the assumptions that they will somehow automatically benefit women though the ergonomical characteristics of women are different than men workers. The contributions of women is very high in the farm sector as they are involved in majority of operations and are subjected to extra harsh conditions of work that leads to drudgery. Tedious, menial or unpleasant work can be termed as drudgery. Drudgery is generally conceived as physical and mental strain, agony, fatigue, monotony and hardship experienced by human being. While all these result in decline in performance of men and women alike. The plight of women in this regard is alarming as they are constrained by illiteracy, poor health, unemployment, low technical know-how and skills. The farmwomen put in hard physical labour beyond their capacity. A continuous work affects adversely their mental and physical well-being. Drudgery in farm operations can be reduced by introducing women friendly improved farm tools and equipments. The purpose of participatory testing and evaluation of women friendly improved farm tools and implements is to help in reducing drudgery, increasing utilization efficiency of inputs, ensuring timeliness in field operations, increasing productivity of woman-machine system, improving work efficiency so as they can also get leisure time, conserving energy, improving quality of work and produce and enhance the quality of work life of farmwomen.

METHODS AND DATA SOURCES:

The modes of study was action research with participatory approach. The study was conducted purposively in three villages nearby the IGFRI institute, namely Karari, Ronija and Pritampura as it requires extensive fieldwork and frequent visits of the study area. A group of 30 farmwomen i.e. 10 from each village were purposively selected for the testing and evaluation purpose. Each sub group of 10 farmwomen were given full exposure about the name, purpose, procedure and operation of the selected tools in different seasons All the selected tools were

tested and evaluated by the women group at there on field conditions during the period of specific operations.

RESULTS & DISCUSSIONS

Performance of tubular maize sheller

The data in table 1 clearly indicates that the shelling efficiency of tubular maize sheller was 98% with only 1% seed breakage as compared to their local practice of stick beating (90%) with 10% seed breakage. It has also saved the .30 man-hour per Q as compared to traditional practices. The field capacity of sheller was found 25 kg / hour while the field capacity of maize shelling by stick beating was only 22.22 kg per hour.

Table 1 Comparative analysis of Tubular Maize Sheller with the existing practices (On average basis N=30)

Particulars	Improved	Traditional
Shelling efficiency (%)	98	90
Labor requirement (Man-hour/q)	4	4.30
Field Capacity (Kg/hour)	25	22.22
Damage/Broken grains (%)	1	10

Performance of serrated sickle

It was observed during the course of investigation that farmers were using desi sickle while harvesting their crops. The desi sickle has heavy weight which reduces the efficiency of the operator as well as cause cuts on fingers and pain in wrist and hands. Desi sickle need repeated sharpening. The use of improved serrated sickle become relevant for more efficient and time saving over conventional methods of harvesting. Table 2 indicates that the labour requirement by using serrated sickle was 16 man days/ha as against the harvesting by local sickle (21 man days/ha). Its field capacity(0.0078 Ha/hr) was also found better than the local sickles (0.0060Ha/hr) .

Table 2 Comparative analysis of Serrated sickle with the existing practices (On average basis (N=30)

Particulars	Improved	Traditional
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Labor requirement (Man-days /ha)	16	21
Field capacity (Ha/hr)	0.0078	0.0060

Performance of sitting type ground nut decorticator

Groundnut decortications were performed by the female farmers. Hence, hand operated ground nut decorticators was selected for this operation. Data in Table 3 shows that sitting type ground nut decorticator was found very much effective in saving the time as its decotication capacity was found 30 kg ground nuts/ hour whereas in breaking by hand or teeth, farm women were able to break only 1kg ground nuts per hour. Besides, its' decortications efficiency (95%) was also found more than their local practice (92%). Although it breaks more kernels (10%) as compared to traditional practices (8%)

Table 3 Comparative analysis of Sitting type ground nut decorticator with the existing practices (N=30)

Particulars	Improved	Traditional
Broken Kernels (%)	10	8
Shelling efficiency (%)	95	92
Capacity (Kg/hour)	30	1

Performance of seed treatment drum

In seed treatment activity mostly the seeds are treated with chemicals directly by hands which causes serious injuries in hands, hence, the seed treatment drum was tested to assess its efficiency. table 4 shows that the mixing efficiency of seed treatment drum (98%) was found much better than the mixing of chemicals with seeds directly by hands (80%) although it took 25 minutes/q which was 5 min. more than their local practice

Table 4 Comparative analysis of Seed treatment drum with the existing farmers' practices (N=30)

Particulars	Improved	Traditional
Mixing time for one quintal (min)	25	20
Capacity (q/hour)	2.4	3
Mixing efficiency (%)	98	80

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Performance of Groundnut stripper

For the purpose of separating the ground nut pods after harvesting, respondents were using sticks to beat the heaps of groundnut plants. In this process they have to stand in bending posture for many hours in open sun. It causes heavy strain to them. Hence, the ground nut stripper was tested to to them from workload. The stripping efficiency of Groundnut stripper was came out to 90%, which was found 10% more than their local practice of stripping with stick or stone (Table 5). Its' Labour requirement (4 man days /q) was also found lesser than their local practices (6 man days/ q). As far as its output capacity is concerned it was found more (25 kg/hour) than their local practices (16.66 kg/hour).

Table 5 Comparative analysis of Groundnut stripper with the existing farmers' practices (N=30)

Particulars	Improved	Traditional
Stripping efficiency (%)	90	80
Output capacity (kg/h)	25	16.66
Labor requirement (man hour/q)	4	6

Percieved feasibility of drudgery reducing tools

Table 6 shows that majority of the respondents reported all the drudgery reducing hand tools and farm implements as most feasible technologies. Maize sheller was found as most feasible by 66.67 per cent of the farmwomen followed by sitting type ground nut decorticator (63.33%) as most feasible. Seed treatment drum was perceived as most feasible by (60%) the respondents while Serrated sickle and ground nut stripper were found as most feasible by 56.67 per cent of the respondents.

Table 6 Feasibility of drudgery reducing hand tools and farm implements as perceived by farmwomen (N=30)

Feasibility	Decorticator	Stripper	Seed Drum	Serrated sickle	Maize Sheller
Not at all	0.00	6.67	6.67	6.67	0.00

feasible					
least feasible	6.67	16.67	6.67	3.33	3.33
some what feasible	10.00	13.33	16.67	16.67	13.33
feasible	20.00	6.67	10.00	16.67	16.67
Most feasible	63.33	56.67	60.00	56.67	66.67

Health hazards reduced by using tubular maize sheller

Data in table 7 clearly shows that by using tubular maize sheller the majority of experienced reduced hand pain (80%), shoulder pain (70%), backache (73%) and waist pain (72%) as compared to their traditional; practices.

Table 7 Health hazards reduced by using tubular maize sheller

Health hazards	Respondents (%)
Hand pain	80.00
Shoulder pain	70.00
Backache	73.33
Waist pain	72.50
In beating process maize start coming over the body and cause injury	60.40

Health hazards reduced by using Sitting type groundnut decorticator

Table 6 indicates that sitting type groundnut decorticator had reduced the finger pain in 73% Farmwomen. It had also reduced hand pain in 60%, backache in 40%, tooth pain in 66% and cuts in mouth in 70% of the farmwomen.

Table 8 Health hazards reduced by using Sitting type groundnut decorticator

Health hazards	Respondents
Finger pain	73.33
Hand pain	60 40

Backache	40
Tooth pain	66.67
Cuts in mouth	70.00

Health hazards reduced by using Groundnut stripper

Table 9 shows that the ground nut stripper reduced the hand pain in 80%, shoulder pain in(77%) and waist pain in (67%) farm women

Table 9 Health hazards reduced by using Groundnut stripper

Health hazards	Respondents
Hand pain	80.00
Shoulder pain	76.67
Waist pain	66.67

Health hazards reduced by using Seed treatment drum

Data in table 10 shows that use of **Seed treatment drum** reduced the health hazards like redness and swelling in hands in 83% farm woman and itching in 63% women caused by mixing of seeds by hands.

Table 10 Health hazards reduced by using Seed treatment drum

Health hazards	Respondents
Redness and swelling in hands	83.00
Itching in hands	63.00

Health hazards reduced by using Serrated sickle

Table 11 indicates that Serrated sickle helped in reducing cuts on fingers in harvesting ground level crops in 80%, pain in wrist and hands in 70% and physical tiredness in 73% caused by the local sickle

Table 11 Health hazards reduced by using Serrated sickle

Health hazards	Respondents
Cuts on fingers due to rubbing of hands in harvesting the ground level crop.	80.00

Pain in wrist and hands due to heavy weight of local sickle	70.00
Physical tiredness	73.33

SUMMARY AND COCLUSION

Hence, it can be concluded that all the five hand tools and implements found effective in reducing the drudgery of farmwomen. Those were better in their on farm performance than their local practices. It has also reduced their health hazards along with saving in their time and energy of majority of the respondents. Majority of the farmwomen perceived these implements as 'most feasible' technology.. It is suggested here that other hand tools and farm implements should also be tested for reducing the drudgery of farmwomen and effective tools and implements should be made easily accessible for them.

RECOMMENDATIONS

- 1- The technologies for reducing the drudgery of farmwomen in agriculture on various production and processing aspects of field operations related to their needs to be identified and made available to the research institutes for verification, demonstration and technology dissemination A number of institutions have developed technologies but the information is lacking. Compilation of these information should be done on larger scale and dissemination of technologies should be done through internet and mass media
- 2- Such type of studies may be conducted on other drudgery reducing farm implements and hand tools for different areas, crops and operations
- 3- Further more impact and adoption studies may be conducted
- 4- After the assessment of these technologies their refinement should also be done as per the ergonomical needs of the farmwomen.
- 5- In view of the larger involvement of women in extra harsh conditions of work in many aspects of agriculture, animals husbandry & household that leads to drudgery. Appropriate training programmes on all the women friendly drudgery reducing technologies should be conducted by all the institutions engaged in training of the farming community. As a training methodology, it would be a good proposition to organize group trainings at village level as it

would ensure active involvement of farm women and effective follow up of training programmes.

- 6- The adoption of various drudgery reducing technologies by farmers specially by farm women will help not only reducing their drudgeries but also in improving agricultural productivity and enhancing employment opportunities and their economic status.
- 7- Efforts should be made by reaching / research / extension institutions which will contribute to a greater participation of rural women in decision making by enriching their body of knowledge and their repertoire of skills providing women options and access to women friendly technologies.
- 8- The extension workers and social scientists working with farmers & farm women should get trained by the Para-medical staff in the aspects related to occupational health hazards in various operations so that they intern can train and also educate farm families about it
- 9- There is necessity to make the knowledge on occupational health hazards as integral component of various training programmes. The KVKS training programmes should be given in the form of package along with popular courses on protection from health hazards. The package should include aspects such as awareness about the recent drudgery reducing and time saving technologies for some leisure and rest, handling and safe use of chemicals and pesticides, storage ways etc.
- 10- A sizable number of well trained women extension personnel should be employed at all levels in training and extension programmes of agriculture development which will be helpful in making them more aware empowered, skilled and independent.