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## Drudgery reduction of farm women using Naveen sickle

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### Abstract

Ghazipur district of Uttar Pradesh has Rice-Wheat cropping pattern in which wheat is the main and most important crop. Harvesting of wheat crop is very drudgery prone task in agriculture domain performed by farm women. It is performed solely by farm women through traditional iron made sickle. It is full of drudgery prone and energy intensive activity in wheat harvesting. The present investigation study the existing traditional sickle used by farm women in the wheat harvesting of Ghazipur district in Uttar Pradesh. Therefore, FLD was conducted to develop farm women friendly sickle for reducing drudgery. It was further replaced with improved sickle i.e. Naveen Sickle in FLD considering the dimensions and ergonomic aspects. 30 farm women were selected from two villages of Ghazipur district for demonstration of Naveen Sickle. And further study was conducted to compare existing sickle and Naveen sickle in wheat harvesting. It was noticed that improved Naveen sickle resulted higher harvesting area and efficiency than the existing sickle. The improved sickle is highly acceptable among farm women. The result found that improved sickle was helpful in reducing the drudgery level, time saving and cost up to 34 per cent as compared to traditional sickle.

**Keywords:** Harvesting, Naveen sickle, drudgery, farm women

### Introduction

The women are the backbone of work force in agriculture and allied sectors. It is estimated to be around 80 percent of farm activities done by women. Farming activities performed by women involved a lot of physical strain and it adversely affects their work efficiency and health problems in long time. Studies have shown that the Indian women work up to 14 hours a day to carry out the most-hard activities on farm and at home. Therefore, the need of the day is to empower farm women with latest improved drudgery reducing equipments and other technologies. These equipments can have higher efficiency, higher work output, reduced drudgery, less health problems and improved quality of life.

In present study 30 farm women from two villages i.e. Bhatauli and Devkali of Ghazipur district were purposively selected for identifying the drudgery prone farm activity in wheat harvesting. A well-structured interview schedule was used to collect primary and secondary data. The result revealed that participation of farm women was higher in activity like manual harvesting. Our study found health hazards to farm women due to drudgery prone activities in wheat harvesting. Result revealed health hazards to farm women due to using traditional sickle in wheat harvesting, because these tools used long hours in sitting and bending posture. Hence, promotion of improved sickle i.e. Naveen Sickle by various trainings and demonstrations are required. It will decrease drudgery in wheat harvesting by farm women.

### Material and Methods

Two villages i.e. Bhatauli and Devkali having Rice-Wheat cropping system was purposively selected for present study. Study was undertaken three years from 2012-13 to 2014-15. 30 farmwomen were randomly selected from two villages. At first baseline information were gathered about farmwomen. In baseline information personal and social variable i.e. age, education, type of family, land holding and monthly income were collected. Age range of farm women was 25 to 55 years. Education varied from illiterate to intermediate and type of family nuclear and joint. Landholding of mostly marginal and small category and monthly income varies from Rs. 2000 to 8000 per month.

By considering the drudgery problem of farm women to improved sickle i.e. Naveen Sickle were purchased from Central Institute of Agricultural Engineering (CIAE), Bhopal. Naveen Sickle was distributed to selected farm women for wheat harvesting. Demonstration was conducted from 9AM to 1 PM and 2 PM to 6 PM each day during harvesting period of wheat.

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Each farm women operated Naveen Sickle in wheat harvesting. Both sickle i.e. Traditional sickle and Naveen Sickle were used one by one to record the data. Man hour requirement and labour per hectare were also calculated.

### Results and Discussion

The main objective of the present study was to demonstrate farm women friendly Naveen Sickle to reduce drudgery in harvesting of wheat crop. To attain objective a comparative study was conducted among traditional sickle and Naveen Sickle. The specification of Traditional sickle and Naveen sickle used for wheat harvesting are given in Table 2 and figure given in Figure 1. Traditional sickle was purchased by farm women in local market and Naveen Sickle were purchased from Central Institute of Agricultural Engineering (CIAE), Bhopal. The weight of Traditional sickle and Naveen sickle was 165gm and 240gm respectively. The length of curve of blade of Traditional Sickle and Naveen Sickle was 17cm and 22cm. The width of blade curve of Traditional Sickle and Naveen Sickle was 11cm and 12cm respectively. No of teeth/cm of Traditional and Naveen Sickle was 9 number and 7 number respectively (Singh *et al.*, 2016<sup>[2]</sup>). Type of cutting edge of Traditional and Naveen Sickle was plain and serrated respectively. Material of blade of Traditional and Naveen Sickle was iron steel and carbon steel respectively. Material of handle of Traditional and Naveen Sickle was iron steel and wooden respectively. The data in [Table-1] reveal that majority (60%) of farm women belonged

to middle age group and 23% of farm women belonged to old age group. Only (17%) of farm women belonged to young age group. Majority of farm women (50%) were illiterate and some of them (33%) were educated up to junior high school (8<sup>th</sup>). High percentage (70%) of farmwomen had nuclear family and less than half (30%) of farm women had joint family. From the findings it can be said that majority of farm women who were involved in farming were of middle age group. Most of the farm women were illiterate.

Data given in table-1 shows that majority of farm women (83%) had marginal and small land holdings. Monthly income is below Rs. 5000/- per month of 53% of families and 30% having Rs. 5001-8000 and monthly income above Rs 8000 of 17% families.

As per table-3, performance of Naveen Sickle over traditional sickle was given. In order to assess performance of Naveen Sickle over traditional, front line demonstration was conducted from 2011-12 to 2014-15. The data given in table - 3 shows that area covered per day by naveen sickle and traditional sickle was 375 sqm and 250 sqm respectively. Similar findings were reported M Shivamurthy *et al.*, 2017<sup>[1]</sup> and Singh *et al.*, 2014<sup>[3]</sup>. It shows area increased 50.40% over traditional sickle. Time consumed by Traditional Sickle and Naveen Sickle was 320hrs/ha and 212 hrs/ha. So it saved 33.75% time due to use of Naveen Sickle (Patel *et al.*, 2013<sup>[4]</sup>). Farmwomen required day/ha was 40 for Traditional Sickle and 26.5 for Naveen Sickle. So it reduced 13.5% labour due to use of Naveen Sickle.

**Table 1:** Personal and Social Profile of respondents (n=30)

Personal and Social Variable	Frequency	Percent
<b>Age</b>		
Young (25 to 35 years)	05	17
Middle (36 to 45 years)	18	60
Old (46 to 55 years)	07	23
<b>Education</b>		
Illiterate	15	50
Primary	03	10
Junior High School (8 <sup>th</sup> )	10	33
Intermediate (12 <sup>th</sup> )	02	7
<b>Type of Family</b>		
Nuclear	21	70
Joint	09	30
<b>Land Holding</b>		
Landless	2	7
Marginal and Small	25	83
Medium	2	7
Large	1	3
<b>Monthly Income (Rs)</b>		
Rs. 2000-5000	16	53
Rs. 5001-8000	9	30
Greater than Rs. 8000	5	17

**Table 2:** Detailed Technical Specification of Sickles

Sickle	Weight (gm)	Length of curve of blade (cm)	Width of curve of blade (cm)	No of teeth per cm	Type of cutting edge	Operation of sickle for crop cutting	Material of blade	Material of handle
Traditional Sickle	165	17	11	9	Plain	Shear (pulling) force	Iron Steel	Iron Steel
Naveen Sickle	240	22	12	7	serrated	Frictional (sawing) force	Carbon Steel	Wooden

**Table 3:** Performance of the Naveen Sickle/Local Sickle in Wheat Crop (2011-12 to 2014-15)

Technology	Area Covered (sqm) (day/women)	Increase in work efficiency	Time consumed (total hrs/ha)	Time saving (%)	Labour required (women/day/ha)	Labour reduction per ha (women/day/ha)
Local Sickle (Farmers Practice)	250.00	-	320	-	40	-
Naveen Sickle (Recommended Practice)	375.00	50.40%	212	33.75	26.5	13.5



**Fig 1:** Traditional and Naveen Sickle

### Conclusion

A large number of farmwomen are involved in drudgery prone activities in farm activities. Difficult tasks involving more drudgery activities performed by farmwomen, so scientifically designed tools reduce their drudgery. It can be concluded that Naveen Sickle was found effective over Traditional sickle. It has also reduced time saving, labour cost and work efficiency. Farmwomen appreciated Naveen sickle over Traditional sickle. Naveen Sickle is more feasible technology. It is suggested that Naveen Sickle should be made easily available for them.

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