



## Women Friendly Tools and Equipments Used in Harvesting in Indian Agriculture

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The traditional tools used by women worker involves operating in bending or squatting posture which causes drudgery and leads to serious health issue such as back pain, knee pain, hand pain and sometimes also causes injury while operating it. Therefore, women friendly some harvesting equipments have been designed and developed by research organisation and state agriculture universities which are briefly described in this article.

### Introduction

Agriculture has important place in Indian economy and main work force in it is human power. The women work force in agriculture and allied sectors is estimated to be around 91 million which amounts to about 39% of the total rural workers in the country. The tools/equipment available for different farming operation are earlier designed for men workers keeping in mind male dominancy in Indian agriculture environment and same was given to women despite of their suitability to work. However women face different technological difficulties in operating these tools, thereby causing serious occupational health problems and ultimately reducing work efficiency.

Most of the activity were women are involved includes sowing, transplanting, weeding, harvesting, threshing, and winnowing which are very drudgery prone. The traditional tools used by women worker involves operating in bending or squatting posture which causes drudgery and leads to serious health issue such as back pain, knee pain and sometime also causes injury to women operating it. Therefore, there is need to develop tools/ equipment considering women suitability to work. A number of farm-tools and implements have been designed and developed by research organizations and state agriculture universities for harvesting, some of which are listed below with brief description.

#### 1. Improved Sickle (Local name - Hasiya, Attad, Iira etc.)

**Function:** For harvesting rice crops, wheat, soybean, chickpea, grasses, niger, sesamum and thin stalked crops.

**Brief description:** It consists of serrated blade, ferrule and wooden handle. With this sickle (serrated) cutting of crop stalk is being done by sawing action as against the impact or pulling action in case of local (plain) sickle. This improved sickle is light in weight i.e., 180 g as compared to local one having weight 350 g, thus reduces the drudgery during harvesting operation. Field capacity of this equipment is about  $150 \text{ m}^2/\text{ha}/\text{hr} = 0.015 \text{ hr}$ . Its cost is about Rs. 60/-.



**Benefits/Advantages**

- Saving in cardiac cost of workers per unit of output is about 15% with improved sickle
- Serrated sickles do not require the sharpening of cutting edge frequently.
- It reduces the cutting force and increases the cutting efficiency.
- Blade has serrated edge; Sharpness of the blade has more efficient long life of cutting edge than the normal sickle.
- It also provides safety to the workers due to its better construction.
- Light weight and easy to handle. Shape of blade is appropriate for cutting. Grip of handle is convenient.
- Handle and blade are fixed with a metal sheet that provides firmness to blade while cutting and ensures safety in use. Protect your hand and minimize physical stress by using improved sickle

**2. Fruit Harvester (Local name- Kota, Angsi etc.)**

**Function:** Plucking of fruits from orchard trees.

**Brief description:** The manually operated fruit harvester consists of main body of PVC having cylindrical shape. The upper end of the body is closed and fixed with two fingers cut in V-shape and with sharp blades. An opening is provided on the body for entry of the fruits to be harvested. The bottom end of the body is open to which nylon net for collecting the fruits is tied. On the back surface of the body a metal holder is fixed to fix the aluminum pipe of required length. The length of the cutting blade was increased from 30 mm to 70 mm to increase the comfort of the worker. Field capacity of this equipment is about 420 fruit/hr. Its cost is about Rs. 600/-

**Benefit/Advantages**

- Damage to the fruit is avoided.
- Operation is made safer as the worker does not have to climb on the tree and the chances of injury are eliminated.

**3. Bhindi Plucker**

**Function:** To protect worker from thorny/chemical materials during bhindi harvesting.

**Brief description:** It fits into the hand properly, with the help of two rings - one in thumb and another in little finger. Force to cut the pedicel is exerted by pressing these two fingers together. Field capacity of this equipment is about 5-10 kg/hr. Its cost is about Rs. 35/-.

**Benefit/Advantages**

It is a tool which helps on plucking of Bhindi (Lady's finger) without causing any itching or discomfort to skin.

**4. Cotton Stalk Puller (wheel type)**

**Function:** To uproot cotton plant stalks from soil.

**Brief Description:** The cotton stalk puller consists of long handle designed in such a way that when the handle is moved downwards, the front jaws firmly hold the stalk due to press plate hinged at the bottom of the main frame. On further downward movement the press plate acts as a pivot and the front jaw portion gets lifted up along the stalk. Once the operation is over the press plate comes to its



original position with help of a tension spring fitted between press plate and mainframe. The unit can easily be moved to next plant with the help of ground wheel. Field capacity of this equipment is about  $280 \text{ m}^2/\text{ha}/\text{hr} = 0.027 \text{ hr}$ . Its cost is about Rs. 1800/-.

#### Benefits/Advantages

- Bending postures is avoided.
- Reduce drudgery.
- Reduce backbone pain.

#### 5. Cotton Stalk Puller (Jaw Type)

**Function:** To uproot cotton plant stalks from soil.

**Brief description:** The cotton stalk puller consists of long handle designed in such a way that when the handle is moved downwards, the front jaws firmly hold the stalk due to press plate hinged at the bottom of the main frame. On further downward movement the press plate acts as a pivot and the front jaw portion gets lifted up along the stalk. Once the operation is over the press plate comes to its original position with help of a tension spring fitted between press plate and mainframe. The unit can easily be moved to next plant with the help of ground wheel. Field capacity of this equipment is about  $46 \text{ m}^2/\text{hr}/\text{ha} = 0.0045$ . Its cost is about Rs. 1200/-.

#### Benefit/Advantages

Bending posture is avoided thus reducing drudgery and chances of backache of workers in cotton stalk pulling operation.



#### Conclusion

These are some tools and equipment mostly used by women workers in India for crop harvesting. Some of these tools are refined and modified as per the need of work of the women operator. By using improved tools, drudgery can be reduced in almost at every stages of operation i.e. in sowing, transplanting, weeding, harvesting and threshing. The farm women can operate these improved tools easily as they are basically developed for them, considering women anthropometric data and their capability. Thus, issues of drudgery and health problems can be addressed by using these improved tools and also there would be improvement in their livelihood.