

Agricultural Mechanization: A Necessity, Not an Option

(*M.V. Jadhav, S. Nikita R. Shendurkar and Tanisha A. Sidam)

College of Agriculture, Risod

*Corresponding Author's email: nikitashendurkar66@gmail.com

Abstract

Mechanization can play a pivotal role by effective time management, reduction in wastage, the cost of production per acre and improved operating efficiency through climate controlled ergonomic operator environment, thus leading to an increase in revenues and much needed improvement in the living standards of the farmer community. In recent years, mechanization has also helped bring back rural youth to this vocation which was rampantly being abandoned by them. Agricultural mechanization has opened up avenues such as alternate professions which have resulted in increased profits and over the years have developed into lucrative business opportunities.

Keywords: Seedbed preparation, Sowing and Planting, Harvesting, Threshing, Weeding, Intercultural operations, Benefits of Farm Mechanization.

Introduction

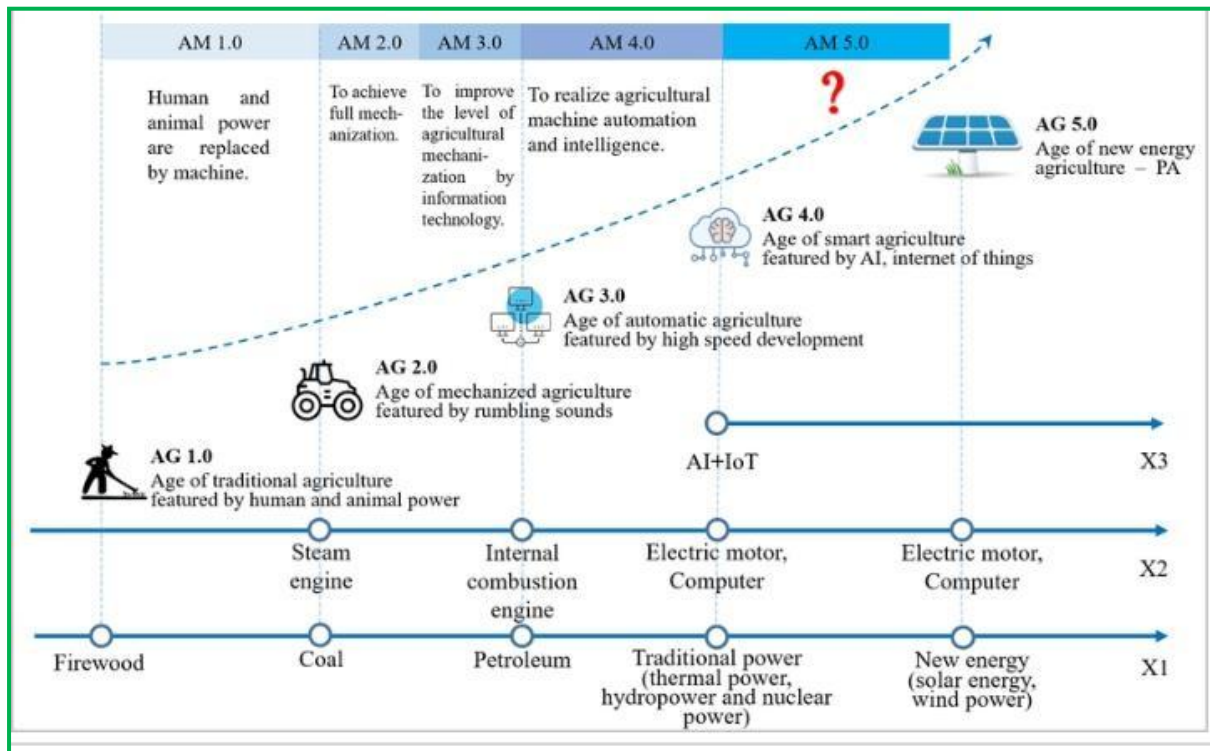
Mechanization can play a pivotal role by effective time management, reduction in wastage, the cost of production per acre and improved operating efficiency through climate controlled ergonomic operator environment, thus leading to an increase in revenues and much needed improvement in the living standards of the farmer community. In recent years, mechanization has also helped bring back rural youth to this vocation which was rampantly being abandoned by them. Agricultural mechanization has opened up avenues such as alternate professions which have resulted in increased profits and over the years have developed into lucrative business opportunities.

Seedbed Preparation

- 1) The removal of debris. Insect eggs and disease spores are often found in plant debris and so this is removed from the plot. Stones and larger debris will also physically prevent the seedlings from growing.
- 2) Levelling. The site will have been levelled for even drainage.
- 3) Breaking up the soil. Compacted soil will be broken up by digging. This allows air and water to enter, and helps the seedling penetrate the soil. Smaller seeds require a finer soil structure. The surface the soil can be broken down into a fine granular structure using a tool such as a rake.



- 4) Soil improvement. The soil structure may be improved by the introduction of organic matter such as compost or peat.



Sowing and Planting

What is Sowing?: Sowing is a process of planting seeds into the soil. During this agricultural process, proper precautions should be taken, including the appropriate depth, proper distance maintained, and soil should be clean, healthy and free from disease and other pathogens including fungus. All these precautions are essential for seed germination the 1 process of seeds developing into new plants.

Methods of Sowing:

Traditional Method:- A funnel-shaped tool is used to sow the seeds traditionally. The funnel is filled with seeds and the seeds pass through two or three pipes with sharp ends. These ends enter into the soil and the seeds are placed there.

Broadcasting:- In this process, the seeds are scattered on the seed beds either mechanically or manually. In the broadcasting method of sowing, the seeds are spread uniformly and are then covered with planking. When there are a large number of seeds, the work is done using mechanical broadcasters. The seed rate is very high in this system.

Dibbling:- Holes are made in the seedbeds and the seeds are placed in it. The seedbeds are then covered. The holes are made at definite depths. A dibbler is used for dibbling. It is a conical instrument that makes proper holes in the seedbed. This method is usually used to sow vegetables.

Drilling:- The seeds are dropped into furrow lines in a continuous flow and are then covered with soil. This is done either mechanically or manually. The proper amount of seeds are sown at proper depths and proper spaces. Drilling can be done in the following ways:

- 1) Sowing behind the plough
- 2) Bullock-drawn seed drills
- 3) Tractor-drawn seeds drills

Seed Dropping behind the Plough:- This method is commonly used in villages to sow a variety of food crops such as maize, peas, wheat, barley, and gram. Seeds are dropped in furrows behind the plough by a device known as malobansa. It comprises of a bamboo tube

with a funnel-shaped mouth. It needs two men to drop the seeds. One handles the bullocks and the plough and the other drops the seeds. However, this method consumes a lot of time and is labour-intensive.

Transplanting :- In this process, the seedlings are first planted in nurseries and then planted in the prepared fields. It is usually done to grow vegetables and flowers. A transplanter is used for the purpose. But, this process is time-consuming.

Weeding, Intercultural Cultivation

What are Weeds?: Weeds are unwanted, undesirable, persistent, and damaging plants that grow alongside the crops in fields. They interfere with various human activities as well as affect the growth of crops in the fields. They compete with the crop plants for water, nutrients, space, and light. Some of these weeds may be poisonous for animals and human beings.

Why Plants Have To Be Protected From Weeds?: As we all know now, weeds are the unwanted plants grown in fields and gardens along with the main crops. They affect the main crop in many ways. It is estimated that 45% of the total loss of production in agriculture occurs only due to the weeds. Do you know how they affect the crops negatively? Some of the harmful effects of weeds are listed below:

- 1) Weeds compete with the crop plants for nutrients, light, water, space and other growth factors and reduce crop yield.
- 2) Weeds may cause various serious issues and restrict the growth of plants.
- 3) Apart from competing with the plants, some types of weeds can block the drainage pipes.
- 4) Unchecked weeds can hamper the movements of several types of machinery used for cultivation.
- 5) Some weeds can suffocate young plants that are trying to grow healthier.
- 6) Weeds can also attract bugs and insects that can destroy crops.
- 7) It may also increase the chances of different plant diseases.
- 8) Tobacco mosaic virus (TMV), Cucumber mosaic virus (CMV), Impatiens necrotic spot virus (INSV), Tomato spotted wilt virus (TSWV), and members of the Potyvirus group are among the viruses found in weeds that are easily transmitted to many other plant species.

In order to protect the crops from the harmful effects of weeds, it is very necessary to take proper actions. Farmers adopt many ways to remove weeds and control weeds. There are various methods and ways of removing.

What is Weeding?: Weeding can be defined as the removal of unwanted weeds from the field or garden. In order to avoid the harmful effects of weeds on crops, weeding is the most important practice in many crops. Weeding should always be done before weeds produce the flowers. It should be done 2-3 times whenever weeds start to grow again. Weeds should be controlled in the initial stage.

Types of Weeding:- Weeding can be done in many ways. It can be done manually by removing the weeds by hand or using a trowel or a harrow, or by spraying weedicide or herbicides that destroy the weeds but not the crops. It can be done before the weeds begin to produce the seeds and flowers.

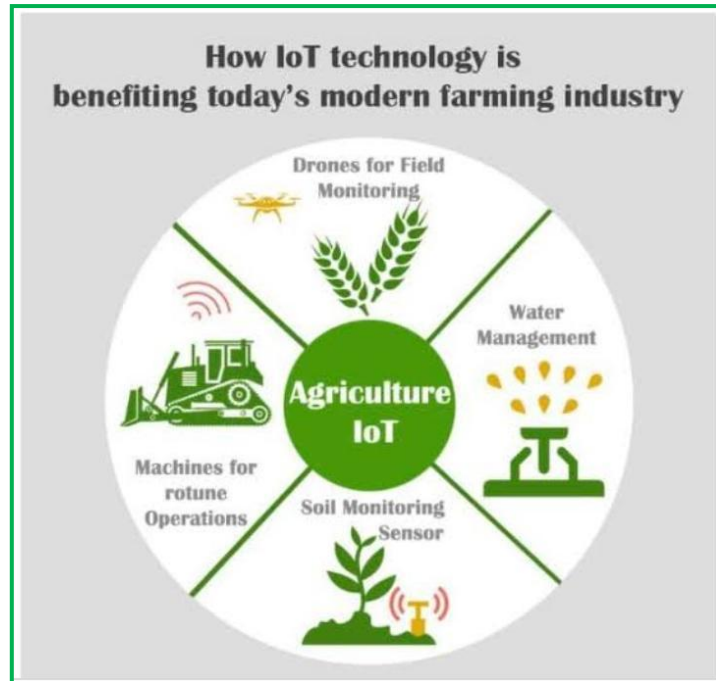
Harvesting and Threshing

Agricultural mechanisation has become an important aspect due to the above-mentioned reasons. It has increased the productive outcomes and economic stability of the farmers in the country. The mechanization includes seed drilling, threshing, harvesting, etc. An important concept in Agriculture is the Harvesting and Threshing of crops.

Harvesting is an important part of cultivation, different procedure and methods are used in different countries. The type of method used depends on the labour availability in the country. The methods are:-

- Manual tools for Harvesting: These tools are simple and easy to handle tools used by farmers themselves to manually harvest the crops. This method includes actions like tearing, slashing, and slicing. For example- Sickle.
- Animal-based tools for Harvesting: In this method, animals, like Oxen, are used to harvest the crops in a field.
- Mechanic-based tools: Mechanic- based tools involve various machines and battery-based tools for harvesting crops. For example- Reaper. After harvesting the crops, the next step is threshing. Threshing has various methods through which it operates. These are:-
- Traditional Method: This method involves stashing the crop into a hard surface, or stamping the paddy with feet, etc. Traditional methods are mostly manual methods.

Apart from these, there are many types of machine-based tools, like- Drummy type, Spike-tooth type, Raspbar type, etc.



Benefits of Farm Mechanization

- 1) Timeliness of operation.
- 2) Precision of operation.
- 3) Improvement of work environment.
- 4) Enhancement of safety.
- 5) Reduction of drudgery of labour.
- 6) Reduction of loss of crops and food.
- 7) Increased productivity of land.
- 8) Increased economic return to farmer.
- 9) Improved dignity of farmer.
- 10) Progress and prosperity in rural area.

Estimated Comar Lutions from FM

- Savings in Seeds: 15-20%
- Savings in Fertilizers: 15-20%
- Increase in Cropping Intensity: 5-20%
- Savings in Time: 20-30%
- Reduction in Manual Labor: 20-30%
- Over-all Increase in Farm Productivity: 10-15%

Conclusion

Mechanization is a crucial input for agricultural crop production and one that historically has been neglected in the context of developing countries. Increasing the power supply to agriculture means that more tasks can be completed at the right time and greater areas can be

farmed to produce greater quantities of crops while conserving natural resources. Applying new technologies that are environmentally friendly enables farmers to produce crops more efficiently by using less power. Increasing levels of mechanization does not necessarily mean big investments in tractors and other machinery. Farmers need to choose the most appropriate power source for any operation depending on the work to be done and on who is performing it. The level of mechanization should meet their needs effectively and efficiently.

Sustainable mechanization can:

- increase land productivity by facilitating timeliness and quality of cultivation;
- support opportunities that relieve the burden of labour shortages and enable households to withstand shocks better;
- decrease the environmental footprint of agriculture when combined with adequate conservation agriculture practices; and reduce poverty and achieve food security while improving people's livelihoods.

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