

# FARM MACHINERY – A HISTORICAL PERSPECTIVE

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## **Abstract**

*Agriculture plays a vital role in strengthening a country's economy. A country's farm sector is highly decisive component in its prosperity. But the conception of farm implements has a stupendous shift owing to the improvised technology development. Deep insights into the systematic change in this sector would reveal the technological development in designing the farm implements. Basically tilling of soil is facilitated by different types of implements. These tools are of primitive nature in earlier days. Thus designed implements have been modified through generations in order to meet the socio-economic needs of the society. Periods emerged when the demand for food grains attained the peak and couldn't match supply of food grains. The design, size, shape and utility of the farm implements are largely decided by the type of soils and topographic conditions. The transformation of the design of farm machinery over the time period is dramatic which reveals the craftsmanship of human minds. The cost factor in the utility of the implements has drastically reduced the overall cost of cultivation. The objective of this study is to understand the transition of the farm machinery of which we ourselves are a part.*

**Keywords:** *Farm implements- Modifications- Period- Efficiency- Cost factor*

## **Introduction**

### **Nomadic farmers**

Agricultural lands are having been dated from the beginning of humanity. They were prevalent in all ancient civilizations. But they were not referred to as farms as they had not been inherited by a particular individual or a private property. Tracing the dates of farming literature reveals farming started only 12,000 years ago. In the stone age or the initial days of human existence human began as scavengers and later transformed to hunter or gatherers(1). Steadily there was transition during the middle period of the stone age to settlement living style or a non-permanent living. The last phase of stone age period witnessed the birth of civilizations and the ultimatum of farming practice(2). This was referred as Neolithic Revolution as it had severe impact on the way of human life style. This paper will project the changes evolved in agricultural machinery as the civilizations progressed.

### **The rise of agriculture**

This paper will project the changes evolved in agricultural machinery as the civilizations progressed. Farming storve its way into human society as hunting and gathering food was not always reliable which resulted in staggered supply of food. This erratic availability of food grains or plants forced human population to plant the gathered materials and ensure their reproduction(3). This is the basic idea behind the development of civilizations which were at later stages transitioned to full-fledged cities. People did not limit themselves to growing of crops and stretched their activity to raising animals and the ultimatum of domestication. Thus the aggregation of all activities was placed under a single heading as Agriculture(4). This term indicates tilling of soil, sowing of seeds till harvesting of the cultivated produce.

### **Farming around the world**

Agriculture during stone age period too was diversified with different patterns of cropping system adopted all over the world. Eastern world had grains and cereals like barley as their staple food(5). Fertile areas were supported with animals raised for food, milk and clothing. Paddy dominated China from the ancient period, whereas beans, squash, corn were restricted in north and south America.

### **Farm Machinery**

Latest advancements in farm implements have yielded high powered efficient ones. But these have been developed from the ancient small tools which were innovations of the earlier farming community(6). Their first attempt was to advance farming beyond working directly with hands, sticks and simple stones.

### **Forked sticks**

The earliest form of plough was forked sticks which were used to scratch trenches in soil to plant seeds (before 5000 years ago). They were a subtle substitute for hoes in certain climates(7). Then after domestication of oxen as draft animals (around 4000 BC) more efficient ploughing technologies started to emerge.

**Sickles**

This was used to harvest grains. It empowered human to harvest large quantities of grain. They were simple flint or stone blades fitted to a wooden handle. These sickles were the earliest applications of metals with copper or bronze in farm machinery(8). Even a minimum improvement to the design resulted in a higher productivity. Sickles were proliferated into long bladed and long handled scythe which garnered higher productivity than sickles.

**Iron plow**

The first known plow was developed in China(475BC). This was designed with a small metal blade attached to a wooden implement. As there was progress in metal works in farm implements sector this basic model was slowly developed into plow with more metal and which could weigh more too(9). This paved way for cast iron plows. Metal plows were able to work in colder and clay based soil. Then finally steel plow was discovered and introduced into farming.

**Yoke**

This is the supporting shaft of other farm implements like plow or a leveler. The yoke has a projection at the center to which a beam of implements like plough, leveller and harrow etc. are secured by a rope

**Leveller**

The plank of the leveller is made of any locally available wood and shafts are generally made of bamboo sticks(10). Extra weight is added to all type of planks by placing stones on it or having person (s) ride on it. As the name suggests, levellers are used for levelling land.

**Harrow**

It has a wooden plank to which wood/iron pegs, handle and bamboo shaft are fitted. It is used for breaking soil crust after rain and also for uprooting weeds.

**Mallot**

It has a wooden block to which a handle is attached. Occasionally, one end of the block is tapering. It is used for the breaking of clods.

**Khilna**

Its handle is made of a branch of sturdy wood and the tool itself is made of iron and is shaped like an arrowhead. It is used for uprooting of weeds

**Kudali**

Used for digging and weeding operations, it is made of materials similar to the Khilna with the exception that the iron end is flat.

### **Seed drill**

Sowing seeds manually were time consuming and they were replaced by seed drills. It was discovered by Jethro Tull in 1701. This marked a new beginning in farm implements. Seeds were scattered or in few cases hand sown individually which were major reasons of low productivity. This seed drill could be operated manually or by animals. This innovation was the beginning of integration of technologies.

### **Cotton gin**

This implement was used to separate cotton seeds from cotton fibers which is a laborious task. Cotton bolls upon harvesting had to be dried and then processed. This processing decides the quality of the produce. This implement was a gift to farming since cotton is a cash crop.

### **Steam engines**

Farming was in need many numerous intercultural practices. Steam engines were used in early 19<sup>th</sup> century . They could be placed inside a field and power was transmitted by a belt or a drive chain. Later developments resulted in steam traction engines which could operate a plow inside the field. They paved way for the modern tractors in farming and nowadays tractors are an inevitable implement in farming. Recent farming are aided with tractors modernized as harvesters which can harvest, thresh and winnow the grains thereby mechanizing farming to the fullest extent.

### **Conclusion**

Mechanization in any production process aids in improved outputs and thus resulting in higher production efficiency. This context is highly applicable to Indian conditions as still fragmented and small land holdings prevail. They continue to use indigenous tools and implements in farming. The prime objective in using such tools are due to their cheaper and economic availability during crop production periods. Such implements help them to be self-sustainable. The prime objective of agricultural engineering domain is to strengthen these indigenous implements by scientific standardization methodology by blending traditional and modern scientific knowledge which could ultimately aid in completing the work in less time and reducing drudgery.

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