

## **FARM MECHANIZATION**

**Mechanized agriculture** is the process of using agricultural machinery to mechanize the work of agriculture, greatly increasing farm worker productivity. The effective mechanization contributes to increase production in two major ways: firstly the timeliness of operation and secondly the good quality of work. The requirement of power for certain operations like seedbed preparation, cultivation and harvesting becomes so great that the existing human and animal power in the country appears to be inadequate. As a result, the operations are either partially done or sometimes completely neglected, resulting in low yield due to poor growth or untimely harvesting or both.

### **SCOPE OF MECHANIZATION**

It is quite true that the Indian farmers have the lowest earnings per capita because of the low yield per hectare they get from their holdings. One of the few important means of increasing farm production per hectare is to mechanize it. Mechanization in India may have to be done at various levels. Broadly, it can be done in three different ways:

- I. By introducing the improved agricultural implements on small size holdings to be operated by bullocks.
- II. By using the small tractors, tractor-drawn machines and power tillers on medium holdings to supplement existing sources.
- III. By using the large size tractors and machines on the remaining holdings to supplement animal power source.

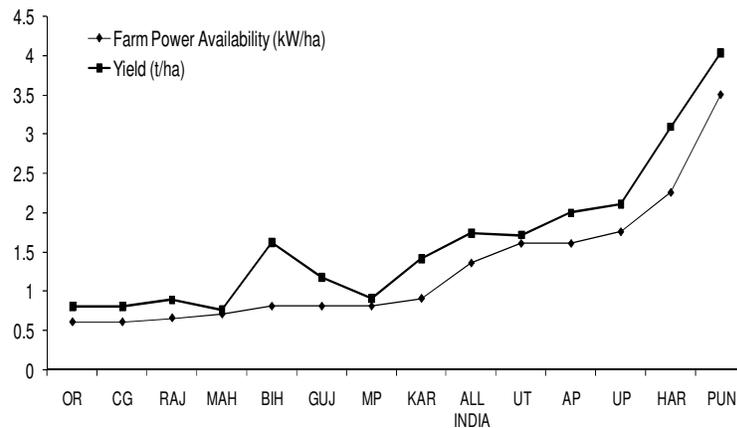
But many people are of the opinion that Indian agriculture cannot be fully mechanized. Only the improved animal-drawn implements should be introduced. It is felt that

1. There is a surplus of agricultural labour in India.
2. There are enough draft animals available in the country to do the farm work effectively.
3. The size of farm holdings of the majority of the Indian farmers is too small to justify the use of a tractor on their farms.
4. The investing capacity, of the farmers is too poor to buy a tractor and tractor-drawn implements.
5. The technical know-how of the people in the country is low.
6. In the absence of suitable farm road system, the tractor and tractor-drawn machines cannot be effectively utilized under the present conditions.
7. It will not be possible to increase the yield by using mechanical power.

8. Mechanization will not result in lowering the cost of production.
9. It will not be possible to mechanize every bit of farm operation.
10. A large labour force will get displaced from agriculture.

History indicates that the development in farm mechanization is very closely related to the shortage of human labour and industrial development in the country. Farmers of India like their counterparts in other countries are interested to improve their income, life style and general well being. They see mechanization as a means for achieving their objectives. In spite of the limitations with which they exist, their performance has been note worthy. There is a positive correlation between application of improved technologies and the land productivity.

### Impact of mechanization on productivity



Source: Indiaagristat.com

### **Direct correlation of higher productivity with higher Mechanization level**

The technical know-how of the people in the country is quite satisfactory. It always develops with the opportunities and experience. The repair, maintenance and overhaul facilities for tractors and other machines are expanding, even in the small towns, with the expansion of rural electrification in the country.

Drudgery and physical exertion are typical of much Indian agriculture today. It scares away men of intelligence and ability from agriculture. All people would favour minimizing this to a considerable extent. The development of improved riding type animal drawn machines can improve the present condition, but they cannot be a substitute for the tractor-drawn machines. By using mechanical power, man will be able to control larger areas and as such his family members will get more free time.

More power is essential in carrying out operations effectively at the right time and for changing the attitudes and uplifting the social status and dignity of those who work in agriculture. There are three ways in which progress can be made towards increased power, all of which must be worked on simultaneously in combination with integrated and matched implements.

1. By improving bullock harness and hitches;
2. By developing and introducing small tractors;
3. By increasing the number of large horsepower tractors.

These machines will be helpful in providing power efficiently for good seedbed preparation, which is quite essential for maximizing the germination of the seed and seedling growth. In addition to this, the mechanization of the following fields of agriculture- is equally essential.

- I. Shaping and levelling of farm fields for getting even distribution and depth of irrigation water;
- II. Development of planting and fertilizing machines to place the seed more precisely in rows and to place the fertilizer correctly with respect to seed or plant;
- III. Spraying and dusting machinery to apply chemicals for weed and pest control;
- IV. After production operations such as harvesting, threshing, winnowing and drying.

**State of Mechanization:** Agricultural system all over the world has undergone changes in terms of cropping system, type of power sources used and application of inputs to achieve high level of productivities. Even in India, mechanization of agriculture has advanced considerably. In certain region, the level of mechanization has gone far ahead of the average level in the country. Human and animal power sources are no longer the predominant sources on Indian farms. The annual addition of tractor population is more than one hundred thousand tractors. Similarly about the hundred thousand pump sets are being installed on Indian farms annually. On the basis of annually critical review of the mechanization position, one observes that the shortage of labour and high labour wages are the factors which strongly propel mechanization. Consequently, the more labour intensive operations, such as pumping of irrigation water, land preparation and threshing are the first operations, which are mechanized. Large amount labour or draft power, which can be replaced through machines, provides a strong incentive to mechanize. The farm operations, which can be categorised as:

- I. Highly power intensive operations,
- II. Intermediate power and control intensive operations,
- III. Highly control intensive operations.

Operation	Highly Power Intensive	Intermediate Level	Highly Control Intensive
Water Pumping	√	-	-
Tillage	√	-	-
Direct Seeding	-	√	-
Transplanting	-	-	√
Weeding	-	-	√
Plant protection	-	√	-
Harvesting	-	√	-
Threshing	√	-	-
Milling	√	-	-
Transport	√	-	-

### **SOCIAL CONSIDERATION TO FARM MECHANIZATION**

The steps towards development of an appropriate agricultural technique in India are not working with the motto of saving labour but of improving and increasing agricultural production. Most people believe that India is burdened with surplus labour and that there are far too many draft animals for the cultivation of available farmland. Above all, there is an unfounded fear that farm mechanisation will precipitate widespread rural unemployment as agriculture contributes over two-thirds of all jobs in India. The fact is however, that India's increased food requirements must be met through increased productivity of the land from higher yields and more multiple cropping which would require additional labour for carrying out different farm operations.

From the energy application point of view, the Indian agriculture is in the transition from stage 1 (human power) and stage 2 (animal power) to stage 3 and 4 (power tiller or four wheel tractor). However, animal power will co-exist with mechanical power in the country. Animal drawn machines must be provided with tiding arrangements so that walking behind the machine can be avoided.

The following can help in increasing the agricultural production in the country:

- I. Agriculture must continue to productively employ as many or more labourers per cultivated hectare in the foreseeable future.
- II. The small & scattered land holdings and the poor economic conditions of the average farmer restrict the use of units designed for large-scale mechanisation. The power tillers and related equipment, therefore, find a greater scope to be used on such farms. Power tillers attached with rotavator are better suited for puddling operations in rice growing regions.
- III. The power availability on the farm should be increased by 2.5 times more to achieve

objectives under intensive agriculture in low intensive energy use areas.

- IV. Cropping intensity should be increased to 200 to 250 per cent level from the present level of 100 to 180 per cent.
- V. Due to the fragmentation of lands, the number of holdings has gone up and therefore, appropriate size of farm machines have to be introduced for the tillage, planting transplanting and harvesting of crops. Custom hiring of machines will have large scope in future.
- VI. An economical multi-crop thresher may be developed to suit farmers' need. High capacity threshers capable of threshing wheat and paddy crop at 15 to 20 per cent moisture content need immediate attention.
- VII. Custom hiring of farm equipment should be encouraged as it has resulted to the increased power availability on the farms and in turn increased land productivity.
- VIII. Post harvest technology deserves special attention on Indian farms.