

Farm mechanization: currently crucial to sustainable agriculture

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Mechanization is the process of changing from working largely or exclusively by hand or with animals to doing that with the machinery. Farm mechanization implies the use of mechanical technology in the varied farming operations like sowing, harvesting, threshing, leveling, watering, spraying, weeding etc. It is the key input in any farming system by ensuring that farming tools are environmentally sound, economically affordable, adaptable to local conditions and resilient in terms of changing weather patterns and climate. Mechanization helps in achieving better harvest and increased income.

The entire history of agriculture contains many examples of the use of tools, such as the hoe and the plough. The ongoing integration of machines since the Industrial Revolution however has allowed farming to become much less labour intensive.

Current mechanized agriculture includes the use of tractors, trucks, combine harvesters, countless types of farm implements, aeroplanes and helicopters for aerial application and other vehicles. Precision agriculture even uses computers in conjunction with satellite imagery and satellite navigation (GPS guidance) to increase yields.

Emergence of agricultural mechanization:

The Agricultural machinery industry emerged in Britain and United States in 19th century, until then common tools of farming were the plough and sickle. In 19th century, 'John Deere' emerged as the agricultural machine manufacturer. Other companies arose from the introduction of horse drawn reaping replacing hand reaper. The "Case Corporation" started in 1842 as the Racine threshing machine works. In late 19th century, more companies such as Richard Garrett and Sons and Mann patent steam cart in Britain developed steam tractors for direct ploughing.

In 20th century, the internal combustion engine, first petrol engine and then diesel engine become the main source of power for the next generation of tractors. The diesel engine also



contributed to the development of the self propeller combine harvester and thresher or combine harvester.

In the second part of 20th century, the production of agriculture machinery rose rapidly.

Benefits of Mechanization:

- Mechanization leads to the improvement in techniques of farming over large areas. For example, by using tractor attached cultivator, we can cultivate more land and thereby extend the cultivated areas by smoothening the gullies, depression and removing weeds. Similarly, we can artificially irrigate the crops by drip or sprinkler effectively with least water and cover more area under irrigation.
- It reduces the drudgery on animals and humans and can save the time and labour.
- Mechanization in farming method results in shift from conventional farming into commercial farming. Commercial methods gives more productivity and profit to the farmers and help in reaching international market.
- It could mitigate farm labour shortage
- It reduces fodder area without reduction in quantum of fodder availability (through increase in fodder productivity) and expands the food area.
- By utilizing mechanical power in agriculture, it leads to reduction in use of animal power whose availability is decreasing day by day.
- It ensures best return of farm income.
- It reduces health hazards. Farm mechanization reduces health hazards including those posed by the use of hoe, diggers, knives, stumps and pests.
- Farm mechanization enables the people to become specialized in certain operation in farms.
- It helps in better cooperation among farmers. Farmers cannot purchase each and every machine. They generally use the machinery by custom hiring by which they hire the machines from other farmers and dealers, use the machines and pay the money to the farmers/dealers from whom they have hired the machines. In this way, the cooperation amongst the farmers can be improved and they could work collectively.
- It removes the difficulties in farming. Generally farming operations involve very hard work which could be removed by using mechanized equipments for their farming operations.
- The cost of using machines on the farm is cheaper in the long run as compared to the cost of farm labour that is always rising.



- It prevents bad agricultural practices such as complete burning of all vegetation on new farmland.
- The use of machines in farming may attract young and educated persons to take up farming as an occupation.
- The mechanization of farming may release some workers formerly engaged in farming to take up jobs in agro allied industries in urban centers.

Increasing level of mechanization does not necessarily mean big investment in tractor and other machinery. The farmers need to choose the most appropriate power source for any operation depending on the work to be done. The level of mechanization should meet their needs effectively and efficiently. Reduction of drudgery is the key element of sustainable mechanization by taking the modern technologies and implements for improving the productivity and yield.

Overall farm mechanization in India has been 40-45%. With the decrease in the land and water resources and labour forces, there is simultaneous decrease in sowing and post harvesting operations. There is a linear relationship between availability of farm power and farm yield and government has decided to enhance the farm power availability from 2.02 KWH to 4.00 KWH by the end of 2030 to cope up with the increasing demand for the food grains.

Government has launched a sub mission on agricultural mechanization in 2014-2015. Under this scheme, assistances are provided to state governments to impart training and demonstration of farm machinery and to provide assistance to farmers for purchase of various agricultural machineries.