Farm mechanisation in India: Challenges going forward

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The country’s agricultural production has stagnated at a time when the broader elements of the economy have grown. In order to sustain an overall growth rate of 9 per cent it is imperative for the agricultural sector to grow at 4 per cent. Though India has achieved self sufficiency in foodgrain production, the last couple of decades have seen the growth rate of food grain production (1.5 per cent) lag behind that of population (1.9 per cent).

Growing demand

While efforts such as introduction of high yielding varieties and expansion of irrigated area have played a crucial role in achieving the goal of food self sufficiency in the past, rapidly growing demand for food has brought the need for building efficiencies in agriculture to the forefront.

Towards this objective, it is imperative to focus on improving the intensity of farm mechanisation in the country. It facilitates timely, precise and scientific farm operations, increasing farm input and labor use efficiency. This would result in significant improvement of agricultural productivity.

Advantages

Some key advantages of farm mechanization are:

Increase in crop intensity and yield thus ensuring better returns to the farmer

Reduction of weather risk and risk of non-availability of labor thus minimizing post harvest wastages

Improved working conditions and enhanced safety for the farmer

Conversion of uncultivable land to agricultural land through advanced tilling technologies

Shifting land used for feed and fodder cultivation for draught animals towards food grain production

One of the main contentions of increased farm mechanization has been that it has affected farm level employment. However, historic trends indicated the contrary.

For instance, while the availability of farm power increased from 0.36 kilowatt a hectare in 1971 to 1.4 kilowatt a hectare in 2006, the share of animated labour (that includes animal and human labour) to farm power dropped from 60 per cent to less than 14 per cent.

At the same time, the contribution of human labour to farm power increased close to 50 per cent during the same period.

Increased rural employment

This clearly indicates that growth in farm mechanisation is on account of replacement of animal labor. Further, farm mechanisation also provides different streams of employment related to handling of farm machines thus resulting in increased rural employment.

Clearly, increased farm mechanisation is a key step towards better rural prosperity. However, farm mechanisation in India is in the initial stages of development and dominated by use of tractors and tractor mounted implements.
While the Indian tractor market is highly organised and among the largest in the world, the farm equipment market is dominated by unorganised players accounting for more than 50 per cent of market share.

**Issues and Challenges**

Though, India is one of the top countries in agricultural production, in terms of farm mechanisation, it is behind the world average. For instance, the tractor density of India is about 16 tractors for 1,000 hectares, while the world average is 19 tractors and that of US is 27. Clearly, there is significant opportunity for mechanisation of agriculture.

However, this sector faces some key challenges such as:

Highly diverse farm size & soil types: resulting in the need for customized farm machinery and equipment for different regions of the country.

Skewed and seasonal usage resulting in low economic viability: This calls for innovative solutions for scaling up usage

Irrigation facility: Best results from mechanization can be obtained if the usage is coupled with sufficient irrigation

Cattle population: Increased mechanisation results in surplus draught cattle and their upkeep is a concern for the farmers

Extension service: Education and training for efficient usage of farm equipment is required to be imparted along with knowledge about selection of appropriate machinery

Capital investment, operational & maintenance cost: small and marginal farmers have cyclic nature of revenue streams resulting in limited capital availability

**Recommendations, Way Forward**

Though policy makers have initiated preliminary support to farm mechanisation by including it as focus area in broader schemes such as in Rashtrya Krishi Vikas Yojna and Macro Management of Agriculture schemes, concerted focus on this sector is still lacking. A lot more focus needs to be brought in to further enhance the growth of this sector and tap the immense potential it offers.

Some of the key areas that need specific interventions include:

Develop a legislative and structural framework that encourages custom hiring (renting) services so as to facilitate better capacity utilisation of farm equipment.

Enabling framework to encourage land consolidation and development of land lease market to make efficient use of farm machinery.

Need to focus research efforts towards design and development of farm machinery suitable for different types of soils, farm sizes and diverse crops.

Increased focus on commercialization of research done by various university especially in the farm equipment space.

Focus on standardization and quality control especially for farm equipment so as to protect the interest of farmer and increase usage.

Sensitize small farmers having operational holding of less than 4 ha from owning tractors unless they have substantial grounds to make economical use of it.

For taking care of the requirements of small and marginal farmer, the following measures need to be encouraged:
Formation of cooperative for ownership of farm machinery at village level

Supporting the finance of second hand tractors for small farmers;

Extension services to advise the farmer on suitability of various makes, models and horse powers for different size of land holdings.

In conclusion, though mechanization has improved the state of agriculture in certain parts of the country, it is still a bottom of the pyramid story and it will remain so unless concrete measures are taken to propel farmers towards adoption of efficient farm mechanization practices especially in the farm equipment space. Given the right focus from various stake holders, farm mechanization has the potential to play a critical role in increasing farm productivity and improving rural employment generation.