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SCOPE, PROGRESS AND CONSTRAINTS OF FARM MECHNAIZATION IN INDIA

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ABSTRACT

In the context of increasing commercialization of agriculture, mechanization is very important. There has been increase in the use of farm machinery in Indian Agriculture as it contributed to the increase in output due to timeliness of operations and increasing precision in input application. Most of the mechanical inputs have displaced human and bullock lab our, which is socially unjustified. Some states like Punjab, Haryana excelled in farm mechanization, but have experienced it as over- investment. There cannot be going back from mechanization but we frame suitable policies such as liberalizing land lease market, encouraging cooperative management and custom hiring of machinery,

INTRODUCTION-

The technological improvements in Indian agriculture since mid sixties have brought about revolutionary increase in agricultural production. Interestingly, the growth rate of food grain production particularly in case of wheat and rice was much higher than the growth rate of population. The country was facing acute food shortages till eighties has now become not only self sufficient but also a net exporter of food grains. This has been made possible due to evolution of high yielding crop varieties, increased use of chemical fertilizers, development of irrigation facilities and plant protection measures accompanied by effective price support programs of farm products.

SCOPE OF MECHANIZATION –

Farm mechanization has been helpful to bring about a significant improvement in a agricultural productivity. Thus, there is strong need for mechanization of agricultural operations. T he factors that justify the strengthening of farm mechanization in the country

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can be numerous. The timeliness of operations has assumed greater significant in obtaining optimal yields from different crops, which has been possible by way mechanization. For instance, the sowing of wheat in Punjabi was done up to the first fortnight of November. A delay beyond this period by every one week leads to about 1.50 quintals per acre decrease in the yield. This is also correct in the case of other crops and for other farm operations like hoeing, irrigation, harvesting, threshing and marketing which need to be performed at appropriate time otherwise the yield and farm income is affected adversely

CONSTRAINTS IN MECHANIZATION

It is true that farm mechanization has shown good results as of raising the agricultural production and improving the standard of living of cultivators within very short period. But a number of arguments have been advanced against farm mechanization such as:

1. Smallsizeandscatteredholdingsofthefarmersstandinthewayofmechanization. As a result of this, farm machinery generally remains under-utilized.
2. Majority of small cultivators are poor who are not in a position to purchase the costly machinery like tractors, combine harvesters etc.
3. The use of tractor operated machinery may render some of the draft cattle population surplus. Studies under AICRP on Energy Requirement indicate that tractor owning farms do use draft animals for certain jobs. Like-wise farms using animate sources of farm power, use tractor on custom service for certain jobs.
4. The farm machinery have large turn ingredient and thus require comparatively larger farm for economical use. Mechanization may lead to structural change in agriculture in respect of the occupational distribution in the rural economy. There is great shortage of diesel in the country as a whole. Thus, to use so extensive oil based farm machinery is not desirable

PROGRESS OF FARM MECHANIZATION

The traditional farm tools and implement mainly relied on use of animate power. Improved farm tools, implements and machinery, which use both animate and mechanical power were devised from time to time. The average size of farm holding being small, animate power is widely used in many parts of the country. Mechanical power is making its

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impact in Indian agriculture with steady increase in land and labor productivity. The traditional animal operated country plough although give low output and require higher number of field operations are still being used by majority of the farmers. Animal Drawn cultivator and puddler have gained popularity showing an annual growth rate of 3.11% and 7.93% respectively due to higher output and better quality of work.

FARM MECHANIZATION AND EMPLOYMENT

The use of different machines in agriculture has different types of impacts on employment of human and bullock labor. On the basis of data collected under the cost of cultivation scheme, the use of bullock labor has gone down significantly on the three major crops in Punjab as a result of fast mechanization. Although the cost of human labor has gone up but there is considerable decline in the quantity of labor use. For example, in case of wheat, paddy and cotton, the use per hectare was 558.72, 961.44 and 810.65 hours in 1974-75 which declined to 301.15, 450.54 and 605.73 hours in 1998-99 respectively. On the other hand, the cost of farm machinery use has gone up manifolds. Here, it is worth mentioning that it is wrong to say that all sorts of mechanization are unjustifiable. For example, the use of pump sets has established the fact that labor displacement by them is more than compensated by the increased demand for labor in the field of irrigation and other operations.

ECONOMICS OF FARM MECHANIZATION

It is of utmost importance to examine whether the use of machines has been economical or not. On the basis of a study covering 203 farmers having 218 tractors in different districts of Punjab (Singh & Jindal, 1983) it was brought out that the total use of the tractor, which on an average came out 397 hours per annum is much less than the possible extent of 1000 hours. The cost per hour turned out to be very high due to high fixed cost, which can be reduced by increasing the hours of working of the tractor. If it finds work for 600 or more hours per annum, the cost per hour can be lowered significantly. The overall average cost/hour, which was Rs.103.04 by its existing quantum of work i.e. 397 hours declines to Rs.91.77, Rs.86.26 and Rs.82.97 by working per 600, 800 and 1000 hrs. Per annum. The machine becomes economical only if it is gainfully employed for rather than accounting for its unproductive use. Custom servicing increases annual use of farm

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machinery. The committee set up by the Planning Commission (1975) observed that harvester combines were generally demanded by big cultivators and it displaced a large number of agricultural labours in the harvesting season when the opportunities of employment in agriculture were higher for them.

INTER-REGIONAL VARIATION

Singh (1979) studied the growth of tractorization in different districts of Punjab during the years 1960-61 to 1976-77. The author reported that the annual growth of tractors was24.57% in the period 1961-66 which increased to 45.75% during 1966-72 and again declined to 16.49% during the period 1972-77. Ropar district witnessed the highest annual growth rate of 87.69%viz. Punjab, Haryana, Gujarat, Uttar Pradesh and Rajasthan states had high intensity of tractors. A simultaneous view of percentage of farms having more than 4 hectare holdings indicated that Punjab, Haryana, Rajasthan and Gujarat states have high tractor density, perhaps due to higher percentage of large farms. Even though the Punjab state excelled the other states in terms of tractor intensity, yet within the Punjab state district-wise intensity of tractorization as presented in is highly variable. The number of tractors in the state registered fast growth but still there are some districts which have low intensity. For example in Mukatsar district it was as low as 10.65 tractors per thousand of cultivated hectares. Conversely, intensity of tractors in Faridkot was as high as 397.5 tractors per thousand of cultivated hectares, Bathinda (180.54), Ludhiana (147.68) and Patiala (138.81).

DEMAND PROJECTIONS

A number of studies were carried out to project the demand for tractors in the country and in some specific states. National Council of Applied Economic Research (1974) studied the demand for wheeled tractors in the country during the fifth plan period. A single equation model was used to estimate the stock demand of tractors for1973-74 and1978-79. The variables tried in the model were relative price of the tractor, irrigated area, agricultural production and gross cultivated area. The study projected the stock demand level between 2.42 and 2.44 lakh tractors. Further, the annual demand for 1973-74 as 38 to 40 thousand units was estimatedrisingtoabout79thousandby1978-79. Sharma (1998) projected that the

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demand for tractors in India to be 2258 thousand in 2024-25. The study concluded that the saturation point of the demand for tractors would be reached sometime during the period2010-11and afterwards only there placement demand would continue which worked out to be around 25 to 32 thousand tractors annually. Singh (1992) brought out that the total annual demand for tractors in Punjab would vary from 15,000 to 17,000 during the period 1988-89 to 1994-95 and it would be between 19,200 and 25,500 during the period 1994-95 to 2000-01. It was also observed that the adjustments to tractor density in the region of study had almost reached a saturation point and the demand for tractors in such a case would be mainly for replacement of tractors.

FACTORS AFFECTING USE OF TRACTOR-

Naidu and Rao (1977) studied the trend in farm mechanization in India and the variables associated with it. It was observed that there was dramatic rise in the number of tractors during the period of mid-sixties due to Green Revolution. Tractorization was found to be positively correlated with variables such as percent of double cropped area to percentage of net area sown, percentage area irrigated to the net area sown, percentage area under high-yielding varieties to the net area sown, percentage area of holding with more than twenty hectares to net area sown, wages of agricultural labour and annual growth rate of agricultural output. However, there was negative correlation of tractors with agricultural labour per 100 acres of net area sown and working animals per hundred acres of net area sown. Singh and Jain (1981) estimated the utilization of tractor in Punjab and observed that the utilization of tractor was positively correlated with irrigation facilities and it was estimated that the increase in irrigation facilities by 25% could lead to an increase in the tractor use by about 6% and when irrigation facilities were doubled, the tractor use increased to about 9%. The study concluded that the tractor density was higher in those areas where relatively more irrigation facilities were available. Kumar et al. (1995) observed that growth in tractors during 1967-72 was attributed to up rise of wheat high yielding variety seeds in Punjab; however, the latest increase in tractors was due to the steady adoption of mechanized supply of tractors.

POLICY MEASURES

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Mechanization in Indian agriculture is the need of the time but its use has to be viewed from angles of unemployment problems of human and animal force and vast majority of small and uneconomical farms. To rationalize the existing farm machinery is important as seen from the high variability in inter-regional distribution, it is imperative to suggest some policy issues such as;

1. The total use of the farm machinery, which on an average is much less than the prescribed norms. Therefore, there is need to enhance its productive use as a result of which, the fixed cost can be reduced significantly. The use of the machinery for social purposes, which is otherwise unproductive and thus needs to be minimized to the possible extent.
2. The use of the tractor for custom hiring should be encouraged through legislative measures. The various problems faced by the farmers in this process such as uneven distribution of tractors, uniform cropping pattern in the area, social symbol attached to the ownership of tractors and the payment problems should be further probed into for their minimization.
3. The distribution of tractors from area to area should be normalized so that the custom hiring is increased. Further, the small farmers having operational holding of less than four hectares need to be discourageed to own the tractors unless they have substantial grounds to make economical use of it. However, to solve the problems of mechanization of smaller holdings, the possibilities can be:
    A. Cooperative management of farm machinery;
    B. Financing of second hand tractors for small farmers;
    C. Extension services to advise the suitability of various makes, models and horse powers for different size of operational holdings;
    D. Devising smaller machinery suitable for small farms which constitute the vast majority of farmers but the machinery has to be effective and less costly.

CONCLUSION-

The agricultural sector is of vital important for region. It is undergoing a process of transition to a market economy, with substantial changes in the social, legal, structural, productive and supply set-ups, as is the case with all other sector of the economy.