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GOVERNMENT INITIATIVES FOR FARM MECHANIZATION IN INDIA

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ABSTRACT

Farm mechanization means the improved way of doing farm practices that needs least effort and resource. In last century world has witnessed many transformations in agriculture sector. Farming practice has been revolutionized with introduction of tractor & tractor driven equipments (Mechanical). On the other hand important inputs like seed, fertilizers and pesticides (Chemical) are the key input that has been developed to increase the production and productivity. After Independence, rising population, demand for food, poor rural development and pathetic Farmers? socio-economic status, have been the inherent truth about the agricultural sector of India. With the development of mechanization in agriculture, only few states have witnessed to emerged as the model state in agriculture (Since Green revolution). Therefore, this paper aims to review the past and present perspective of farm mechanization in India.

Key words : *Farm mechanization, mechanization, tractor, government.*

Farm operations requiring high power inputs and low skill and/or control are generally the first to be mechanised (tillage, transport, water pumping, milling, threshing, etc.). The power intensive work can be done faster and normally at a lower cost (Singh *et al.,* 1975). Those operations requiring medium levels of power and skill/control tend to be mechanized next (seeding, spraying, inter-row operations, etc.) whereas those requiring a high degree of skill/control and varying levels of power inputs are mechanised last (transplanting, planting of vegetables, harvesting and grading of fruits and vegetables, etc.).

In India, agricultural backwardness still exists in the 21st century. Many states fall in this category except some States, like Punjab, Haryana, and Karnataka have maximum adoption of farm mechanization in comparison to other states of India. This paper aims to review the perspective of farm mechanization in India since independence. Farm mechanization is divided intotwo parts. The first part is to use machines and advanced mechanical tools in farm practices (Machine mechanization). The other is the usage of High Yield Variety seeds, chemical fertilizers, and pesticides (Chemical mechanization). In the 20th century, with the inception of the tractor, agricultural modernization had been initiated (Singh *et al.,* 1999).

Many tractors driven equipment have been innovated since then, for example, rotavator, disk harrow, cultivator, and others. Subsequently, agricultural scientists and researchers have put forward chemical fertilizers and pesticides for better yield. Karl Marx and his followers argued that, like manufacturing, the economies of scale associated with agriculture with more mechanized agricultural practice (Binswanger *et al.,* 1986). This review paper intends to highlight the development of farm mechanization in totality, through various initiatives by Government for Farm Mechanization.

The high level of effective demand for agricultural machinery and equipment led to the creation of a competitive and viable manufacturing industry such that India became globally a leading player in this sector including becoming a net exporter.

Various Initiatives by Government for Farm Mechanization

Since Independence, the socialistic approach of the government towards agriculture is the vital essence behind every scheme and strategy. However, after the 1980s, when India departed from Nehru?s Socialistic era, the spirit behind the approach was also shifted to make agriculture and allied activity more marketable. The agricultural progress has been impressive in comparison to the pre-independence era. The growth rate was 1 percent per annum during the last fifty years before Independence, whereas it is an average of 2.57 percent per annum during 1951-2007. To discuss the government plans over the period, it has been categorized into time periods: a) 1947 to mid-sixties, b) from mid-sixties to 1990, and c) 1991 onwards.

A. 1947-mid 60's (New Born India) : At the time of Independence, Indian farmers used mostly

bullock-drawn ploughs and wooden planks for pulverisation, compaction and smoothening. Hand tools like spades, pick axe, crowbars, hoe, sickle and chopper were in use. For irrigation, watering buckets and Persian wheels and for transportation bullock carts were in use. In late 1950s, manufacturing of irrigation pump-sets started. There were only about 8,000 tractors in 1950 and these increased to 39,000 units in 1960. Engines (petrol, kerosene, and diesel) were being used for post-harvest processing like floor making, rice milling, grinding, etc.

India, before independence, had the largest cropped areas in the world, but with a partition, the area decreases by nearly one-third of the total cropped area. During the 1950s, the net irrigated area was 20.9 million ha (gross irrigated area 22.6 million ha). The country has spent about Rs. Forty-five thousand crores for irrigation development in the first four decades of independence. During 1950-51 to 1965-66, through government channels, expansion of irrigation has been done from 7.2 million ha to 9.8 million ha – a growth rate of 2.1 percent per annum (Ministry of Agriculture and Farmers welfare, 1990).

However, the shortage of food was the severe problem in the Independent India, in lieu, to which PL 480 was the food aid given by the USA. Imports of food-grains constituted around 5 percent of total food grains available in the country in the 50's. It further worsened during the 60's when two severe droughts hit the country, which led to a sharp increase in demand for food-grains, and hence, imports increased by nearly 7 percent of the total availability of food-grains. During same phase, agriculture underwent many reforms and institutional changes; abolition of the zamindari system is one of them.

Although the nation took nearly 20 years to get rid of this system entirely, the question is whether land reform has a positive impact or negative impact on overall agricultural production? If efficient small farms replace inefficient large farms, then there is a benefit, but if smaller farms are not productive, then there is a loss (Rao, 1972).

According to Binswanger and Rosenzweig's theoretical study (1986), large farms inefficiently use their resources. The main reason behind the lower productivity of large farms is that the owner uses more hired labor and less family labor, which is cheaper than the hired worker and also shares the risk of uncertainty. Land ceiling and redistribution of land had a dual effect, on the one hand, many tenants now became cultivators, and on the other zamindars became large farmers and got handsome compensation for land settlement.

The effect and benefit of land distribution soon became visible on the economic growth of poor class and an overall increase in production and employment during the 70's. Due to this reform, many landless cultivators now were the owners of a small piece of land. This was one major step to reduce inequality. Despite all these efforts, India remained dependent on the rest of the world to feed the rising population.

B. Mid 60's to Pre-Reform Period (Green Revolution and parallel changes) : In India, New Agricultural Strategy started with the Kharif crop in 1966. We can see the period from Mid-sixties to the 80's as the second phase of Indian agriculture. The new agricultural strategy, also known as the Green revolution strategy, was successfully implemented in this period. In the mid of two war "New agricultural strategy" was initiated as a pilot project in seven districts and called as Intensive Agriculture District Programme (IADP). Generally, this program attached to HYVs, but it is an injustice if we do not consider the role of chemical fertilizer. IADP intended to initiate research on the enhancement of productivity through HYV. In 1965,

The Indian council of agricultural research (ICAR) was re-established, formerly known as the Imperial Council of Research (16 July 1929). Today we have more than 100 ICAR Institutes and 70 Agricultural universities, it is one of the largest national agricultural systems in the world. During the period of the Green revolution, this research institution became the key for all subsequent development in farming practices through its research and development. As per ICAR, the effect of these researches resulted in increases in production of food grains by 5.4 times, horticulture crops by 10.1 times, fish by 15.2 times, milk by 9.7 times, and eggs 48.1 times since 1951.

During the wave of the green revolution, it became necessary to develop the basic infrastructure. For this purpose, the Command Area Development Programme started during the fifth five-year plan 1974-75, which witnessed the launch of the irrigation project for different sizes of farmland. As per Ministry of Agriculture and Farmers welfare (1990), in the late 80's, diversification increased from food grains to non-food grains like poultry, fisheries, vegetables, and

fruits, which accelerated the GDP from agriculture during 1980-90. The area under principle food crops accounted for 137.10 million ha. (1985-86), and 138.61 million ha.(1990-91), while the non-food crops accounted for 34.53 million ha. (1985-86) and 40.68 million ha. (1990-91).

Establishment of the National Bank for Agriculture and Rural Development (NABARD) on the recommendation of the Shivaraman Committee on 12 July 1982 to provide a rural credit facility saw a new era for agriculture in India. Agricultural price commission 1965, renamed as CACP (Commission for Agricultural Costs and Prices), has been the institution responsible for the recommendation of minimum support price based on the variable input price index. In terms of infrastructural and institutional transition, 1980-90 had a significant impact on the production and productivity of agricultural produce.

The decade (1981-90) was the period which saw a quantum leap in food production and a rapid increase in the rate of agricultural mechanisation. Four new tractor manufacturing units were established but four older units were closed. One new power tiller manufacturing unit started but four older units were closed. The Government of India undertook a concerted effort to popularise tractors and to make them affordable to more farmers (Singh, 2001). Power tillers and tractors with engine capacity above 1800 cc were exempted from excise duty to encourage mechanisation. India, which had been an importer of tractors up to the 1970s, started exporting them in the 1980s.

C. 1991-onwards (Post Reform period) : There has been a significant impact of economic reform of 1991 on agriculture when, with liberalization, many small scale industries initiated, which directly or indirectly were dependent on agriculture. As a result, farmers got a more diversified market. It is the period when the trade with the rest of the world and the export of agricultural output had increased. In 1995 with the introduction of WTO, the domestic market opened for the rest of the world due to the new international trade accord. Local traders and farmers were now in the competition with the international market. So there was a new challenge for policymakers, which lead to the New Agricultural Policy of July 2000. Under this policy, private sector investment was encouraged. Along with it, contract farming and land leasing were popular tools to attract private players. The liberalization of the inter-state movement of agricultural produce was yet another aspect in this regard. Review of excise duty on farm machinery, chemical inputs were also reviewed. Later in the 21st-century pace of rural electrification increased. All these changes contributed directly or indirectly towards the overall production and yield.

CONCLUSION

The story of the development of agricultural mechanisation in India is both fascinating and in many ways, quite remarkable. The country has moved forward over the past six decades from one in which it then faced severe food shortages to where today it has become an exporter of many food commodities and a major exporter of other industrial products, including agricultural tractors. This has been achieved despite a more than three-fold increase in its population and insignificant increase to the arable land area. The high level of effective demand for agricultural machinery and equipment led to the creation of a competitive and viable manufacturing industry such that India became globally a leading player in this sector including becoming a net exporter. The Government of India provided support services for research and development; testing and standards; as well as for human resources development in support of agricultural mechanisation. The agricultural engineering programmes established in the numerous state agricultural universities and institutes were instrumental for the success of agricultural mechanisation in India.

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