IMPACT OF MODERN TECHNOLOGY ON AGRICULTURAL PRODUCTIVITY

Dr. Shailendra Bhushan Sharma and Dr. Babita Chaudhary

Agriculture is one of the most important sectors in the Indian economy. Modern technological trends play an important role in agriculture output of India. Access to new technology is crucial in maintaining and improving agricultural productivity. Farmers' changes of technology use are influenced by technical training, meeting, oral transmission, and trust on technician and belief level on technology. Factors that trigger adoption of new technologies comprise of progressive, young and educated male farmers. Though farmers have positive perception of technology, they faced problems in technology application due to lack of capital, direction and compensation policy. In this context, Government is providing facilities to farmers in increasing their agriculture yield through several schemes.

It is a fact that the agricultural sector for every country is the basic catalyst and accelerator of growth of the industrial and services sectors notwithstanding the overall economic growth of that nation. Agriculture is the most important sector in the Indian economy given its contribution to employment, foreign exchange, food and its linkages with other sectors.

Technology refers to how to cultivate a crop successfully. This success can be obtained by knowing how to apply fertilizer, control pests, and take care of plant for its healthy and good growing. A farming system is the result of a complex interaction of a number of interdependent components – soil, water, crops, livestock, labor and other resource within an environmental setting. The total environment can be divided into two elements: technology and human. Technology determines the type and physical potential of livestock enterprises, and includes the physical and biological factors that can be modified through technology development. The human element is characterized by exogenous (community structures, external institution, etc.) and endogenous factors, which can be controlled by the farm household. It is the household which ultimately decides on the farming systems on whether or not to adopt technologies and how to assign resources to support it. The decision of use of technologies is dependent on how farmers perceive of technology.

The Role of Modern Technology on Agricultural Development of India

Over 68 years since its independence, India has made immense progress towards agricultural development. There has been substantial increase

in available food-grain per capita. Prior to mid 1960s, India relied on imports and food aid to meet domestic requirements. However two years of severe drought in 1965-66 convinced India to reform its farming methods.

India adopted significant technological reforms focused on the goal of food grain self-sufficiency. This ushered in India's Green Revolution. It began with the decision to adopt superior yielding, disease resistant wheat varieties in combination with better farming knowledge to improve productivity. A hectare of Indian wheat farm that produced an average of 0.8 tons in 1948 produced 4.7 tons of wheat in 1975 from the same land. Such rapid growth in farm productivity enabled India to become self-sufficient by the 1970s. By 2000, Indian farms were adopting wheat varieties capable of yielding 6 tons of wheat per hectare. With modern technological policy success in wheat, India's Green Revolution technology spread to rice and other crops. As with rice, the lasting benefits of improved farming technologies now largely depend on whether India develops infrastructure such as reliable electricity production, irrigation network, flood control systems, all season transportation and competitive buyers of produce from the Indian farmer.

Why Farmers do not adopt modern technology:

There is a risk element for farmers in new technology packages. Agronomically the package may seem attractive but he may not be willing to accept the financial risk involved largely because of the increased investment required. The provision of appropriate credit facilities may sufficiently reduce the risk element to make the package more attractive. Followings are the reasons why farmers do not adopt modern technology:

- If the farmers are illiterate or less educated.
- If the technology is new to the farmers do not believe it.
- They have not yet seen the demonstration fields.
- Worry of low yield
- Old age farmers do not believe new technology and only believe in their past experience.
- Old behavior of cultivation practices embedded in farmers for long period.
- Large land holding farmers think that if the

yield is lost due to the use of new technologies in larger field, the amount of loss will be greater.

- Lack of capital
- Lack of skilled labor

Factors Affecting use of Modern Technology in Indian Agriculture

In general, several factors have been identified in the present study as the most important sources for the use of modern technology in agriculture. These issues have been analyzed by linking the strength or weaknesses of the stated technological applications to find out if they help in meeting the objectives.

Research and development

The results of agricultural research include higher yielding crop varieties, better livestock breeding practices, more effective fertilizers and pesticides and better farm management practices. Agricultural research and development is required not only to increase productivity, but to keep productivity from falling. For example, yield gains for a particular plant variety tend to be lost over

time because pests and diseases evolve that make the variety susceptible to attack. Thus, a large share of agricultural research expenditures is devoted to maintenance research.

Education

Farmers can have general skills through education to solve problems. Education is thus an investment in "human capital" analogous to a farmer's investment in physical capital. Education hastens the rate of development of new technologies by training scientists. Education also speeds the rate of adoption of new technologies by farmers. Farmers who have more education may be better able to assess the merits of and successfully adapt a new technology to their particular situations.

System Independence

It is the ability of the technological device to stand alone for doing the required job. Whether the technology will require relatively more capital or labor will be analyzed to check system independence of the technology. As India is a developing country with high population pressure and unemployment, labor intensive technology will

be system independence on the ground of cost. It is also kept in mind that required input for the technology is available or not.

Individual Technology vs. Collective Technology

It is the criteria to look into the societal/ cultural standards in which the technology operates. In other words, it is the careful assessment of the technology that is based on group approach and becomes more system dependent. A society geared towards individual or single family unit will need more system independent technology. Collective technologies are more easily adopted as collective action reduces transaction cost.

Cost of Technology

Affordability of the technology is an important indicator for their wider use since cost is the major factor in encouraging or discouraging the application of appropriate technology in developing economies.

Although the level of cost is high or low is a relative concept, in India labor is relatively cheaper than capital, and therefore, labor-intensive technologies are less costly.

Risk Factor

It is an important factor to find out how smoothly technology works in the local production system and the supportive system that explains to what degree is the technology system dependent or system independent. This indicates the need for understanding two types of risk- both the internal and external risk. Although analysis of risk is necessary before applying new technology, it is almost impossible to remove all risks.

Evolutionary Capacity of Technology

If the chosen device is static it will relatively reflect the short-lived solutions to a much larger problem. The technology, which supports the continuation of development by enhancing capability to expand, can be expected to compete at the regional, national and international level.

Infrastructure

A significant positive relationship between infrastructure and Indian agricultural productivity is very much essential to boost agricultural productivity. The most obvious example of how public investment in infrastructure might affect agricultural productivity is through investment in public transportation. An improved highway system can reduce the farmers' cost of acquiring production inputs and of transporting outputs to market.

Current Performance

Performance of the technology is explained on the basis of their success and failure stories. The current performance has also been assessed on the basis of percentage share of population adopting particular technology.

Conclusion

The role of modern technology in the quest for the best method of improving the yield of crops, protecting crops against diseases and pest, making livestock healthy all the time, designing the best method of crops storage and even helping in predicting the climate conducive for agricultural practice can not be over emphasized. The use of agricultural equipment and machineries help to making farming and other agricultural practice easier for the farmer. In the developing countries like India agricultural mechanization is the order of the day. Promotion to technology with social wisdom can help in checking migration of youth from rural to urban areas), mitigate the adverse impact of climate change and rejuvenate/ revive India's agriculture so very essential for sustainability of India's growth.

On the basis of the results of this analysis it may be concluded that the process of adoption of new agricultural technology in India has been slow and interrupted mainly due to constraints like lack of capital, low price of agricultural produce, problem of insufficient cold storage, inadequate institutional credit, problem of soil and water testing facility, inadequate irrigation facility, high cost of fertilizers, high rental charges of implements and machines.

[The authors are Associate Professor and Head in Department of Management and Assistant Professor in Department of Education at Noida College of Physical Education, Dhoom Manikpur, Distt. – Gautam Budh Nagar, U.P. respectively]