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Short Review Paper

Innovative Agricultural Technology: Viable tool for Socio-Economic Rural Empowerment

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Abstract

Agriculture and natural resource management are crucial for pro-poor growth; empowerment is key to the success and sustainability of development initiatives in these areas. In critical appraisal of Innovative agricultural Technology in India, most of the technology though promising in laboratory, has failed to provide a viable solution for social and economic Problem of the farmers. No Proper attention has been paid towards empowerment and participation of farmers in the decision making process for release of technology thus casting a shadow over the role of meaningful role of agricultural technology. Though some of the technologies, such as improved varieties of seeds have directly benefited, however,, the agricultural sector is still facing many challenges like poverty, lack of irrigation facility and irregular monsoon, droughts, floods, biotic factors such as crop diseases and insect pests, technology adoption due to small holdings, lack of training facilities, other factors such as neglected by extension workers. So it is necessary to understand the problem of rural people specially pertaining to agriculture because agriculture is main plank for rural development, therefore adoption of innovative agricultural technology would provide socio economic empowerment of rural people Frequent interaction between agricultural technology and other determinants of income would lead to quantify the positive impact of technology adoption on resource less farmers, in terms of rise in income and socio-economic empowerment for improvement of quality of rural life.

Keywords: Innovative, Empowerment, Agricultural Technology.

Introduction

Since more than 70% of Indian Population lives in villages, it is necessary to bring about faster development, progress and prosperity of rural area through socio-economic empowerment of rural people and there by improvement of standard of living of rural poor if we want to see our country as developed nation. Agriculture being the mainstay of rural life, adoption of innovative farm technology may provide a viable solution for the social and economic problems of rural people.

Considerable technology is reported to have been developed through research efforts by National Agricultural Research System including the research institute of Indian council of Agriculture Research and State Agricultural Universities. This voluminous technology has neither already been adopted at the field level nor has it proved its worth uniformly wherever and whatever adopted in spite of the Tall claims of the scientists.

"Agriculture connects socio economic growth of the rural poor" and "its importance goes beyond incomes and reduces poverty by lowering and stabilizing food prices; improving employment for poor rural people; increasing demand for consumer goods and services, and stimulating growth in the nonfarm economy"[1].

Agricultural research can contribute to poverty reduction in three major ways. First, agricultural research helps in developing yield-increasing technologies contributing to an increase in the supply of food on which the poor spend a considerable share of their income. The development of high-yielding varieties, which boost food production both by increasing yields per unit of land per cropping season and by facilitating multiple cropping, must remain a critical component of the research strategy to achieve first Millennium Development Goal of halving poverty by 2015. Second, agricultural research help to conserve natural resources since the poor lack alternative means to intensify agriculture except forced to overuse or misuse the natural resource bases to meet basic needs. Third, because the poor tend to reside in marginal agricultural areas, research should aim at developing technologies suitable for these. However, it is widely argued that research often neglected the marginal areas, thereby worsening poverty in them by reducing market prices of grains without improving technology for these areas.

Drawing optimum benefit of the opportunities available depends largely on the socio-economic condition and capacity of rural people. The educational level, economic conditions, social status, available resources, basic attitude and progressive and

retrogressive nature play a crucial role in sustainability of society.

Half of the world's poor people live in south Asian countries and India is significantly one of them[2]. The country continuous to remain among the poor ones and over one third of its population living below poverty line. Methods of production, social organization and political mobilization, in the rural sector is extremely weak[3]. Socio-economic condition of resource less farmers is generally reported to be precarious[4].

Agriculture technology has a strong potential to become a formidable tool of sustainable rural development owing to their nature of social and economic structures'. Although as a result of intensive research effort by the National Agricultural Research System considerable innovative farming technology has been developed in India, with a view to increase farm production to make the country self sufficient in food requirement, provide food security to our ever increasing population and to increase farm income for improving the economic status of farmers.

However even in our own backyard there are a number of examples to prove that the quality of life of rural people cannot be improved without proper utilization and systematic application of agriculture technology in the field.

World leader in Technology adoption

The UK has a science and research base that is world class across a number of agricultural technology disciplines. Government spent £450 million on research and development in agriculture and food in 2011 to 2012, including substantial capital expenditure supporting research institutes and campuses[5]. Conservative estimates of private sector investment in agricultural research and development in the farming sector suggest," It is at least £100 million a year. However, this underestimates the true activity as farming makes up only one part of the agro-tech sector.

In the initial phase the National Agricultural Research System including the research institute of Indian Council of Agriculture Research and State Agricultural Universities were concerned to develop agriculture technology for mainly large farmers. Gradually their activities have multiplied. Today, the agricultural technology has all pervasive; it is working at Gram Panchayat level and through the Krashi Vigyan Kendras. The functioning have started in almost every area of the country. Special emphasis is now laid on the resourceless small and marginal farmers because numbers of small holding are too high.

There are a number of groups working for increasing agricultural productivity and promoting agricultural development in the country. This fact has put India in the forefront.

An Important tool for Poverty Alleviation

Agriculture is the main plank of rural society and it cannot survive without improvement of agricultural production and productivity. At the policy level it started as a movement of socio-economic reforms, particularly in the rural economic domain for promoting Self-reliance, Self-help among rural people. This aims at socio-economic empowerment of the rural society which is possible owing to the farmers participation and it widen the scope of income generating activities by pooling resources. It also helps in enhancing local control over the means of production.

Worlds 75% population is living in rural area and the poverty of these people is a central issue of economic development. These are good reason to emphasize on socio economic empowerment, enhance attention and expenditure towards agriculture development.

Agricultural growth is essential for fostering socio economic development. In developing countries agriculture growth will depend on yield-increasing technological change.

Boon for Rural Poor

Achieving agricultural growth and development and thereby improving rural household welfare will require increased efforts to provide yield enhancing and natural resources conserving technologies. Agricultural research and technological improvements are therefore crucial to increase agricultural productivity and thereby reduce poverty. However evaluation of the impact of these technologies on rural household welfare have been very limited by lack of appropriate methods and most of previous research has, therefore, failed to move beyond estimating economic surplus and return to research investment.

The Agriculture Technology: A friend in Need

India is an agricultural dominant country where seventy percent people are directly and indirectly depend on agriculture for their livelihood. A lot of agricultural technology has been developed by research centers but the majority of it is not reaching the deserving masses.

The agriculture technology is playing a pivotal role in the government's effort to provide opportunity to empowerment of the farmers and helping them to improve quality of life. Technology has helped the farmers to upgrade yield, economic production of crop, net pecuniary returns and improvement in quality of their life. Therefore, all farmers, particularly the resource less small and marginal ones must be encouraged to adopt innovative technology. To achieve this agricultural extension agencies have to shoulder major responsibility. We need to discuss and demonstrate how technology can be applied to improve agriculture for increasing farm yield, production and economic returns.

Initially we need to analyze the requirement and the scope of agriculture technology in small and marginal farms. Monsoon and the other factors like climate and availability of information, regular all-round monitoring system in cost effective way is required for improvement of agriculture. Productivity of agriculture is related directly to application and implementation of information. Hence we need continuous research activities to collect the information regarding the soil health, cultivation practices, on-field factors involved, and judicious and efficient use of irrigation water available.

So there is a basic need to collect, store and maintain such data/information about agriculture by each zone of the country and use the same to serve the interest of the farmer.

Major Source of Employment in Rural Area

The employment generated by various sources in rural areas is shown in Table-1

Table-1
Various sources of employment in rural areas (in %)

Year	Industry and commerce	Service sector	Agriculture and related occupation	Others
2011	2.2	27.2	65.5	5.1
2012	2.1	25.3	64.7	7.9
2013	3.2	28.7	61.3	6.7
2014	3.9	32.8	56.2	7.1
2015	3.4	29..5	62.1	5.00

Source: CRISIL Research Estimate using NSSO report

As per 2015 estimates agriculture and agriculturally occupation contributes 62.1%, industry 29.5% and service sector 3.4% of GDP of the country. Thus we find although many people are employed in agriculture its productivity is low because of lack of adoption of innovative agricultural technology.

Majority of rural population is directly involved in agriculture, owning land holdings. Besides them all artisans in villages whether carpenter, black smith, agricultural labor, agricultural trader, and others all seek their livelihood from farm related activities. This provides employment to over 65 to70% of rural population and keep them engaged practically round the year in farm related activities.

However, the agricultural sector is still facing many challenges like resourcelessness, poverty, lack of irrigation facility and irregular monsoon, other biotic and a biotic stress including crop diseases, insect pests and drought and floods, technology adoption due to small holdings, lack of training facilities, and other factors such as utter neglect by extension workers. Over and above all agricultural business is in the hands of middleman which regularly suffers from situations of glut and scarcity, making always the farmer suffer. So it is necessary to understand the problem of rural people specially pertaining to agriculture because agriculture is main plank for rural development. The delivery and adoption of proven innovative agricultural technology would provide socio economic empowerment of rural people in general and the farmers in particular.

Much of this relates to the lack of transformation of subsistence-oriented agriculture. Unless new strategies are designed and implemented, these problems not only threaten the sustainability of agriculture and future avenues of growth but may also amplify the process of marginalization in agro-economic zones.

After about seven decades of independence nearly one third of the Indian are still suffering from starvation, acute poverty, productivity crises particularly in agriculture sector. Despite intensive effort for food security, our storage of food grains is substandard and child malnutrition in South Asia remains at highly alarming levels. Due to acute poverty and unequal access to productive assets, the growth of agriculture did not prove to be sufficient to maintain the level of socio economic condition of rural people. The dry land agriculture finds that depth of poverty is still acute in many regions due to limited investment on research and development because the data showing the position and the actual scenario during the last decade or so widely differ. Even in the irrigated area the productivity is very poor. As land become scarce, the rural people migrate to cities in search for their livelihood.

Increasing mechanization of production and adoption of less labor intensive technologies in green revolution areas, however, limits the absorption of migrants from the marginal regions. Marginalization and poverty in arid and semi-arid regions is also associated with increasing scarcity of water, incidence of drought, and degradation of the natural resource base. This invites urgent attention of the concerned scientists and the relevant extension agencies.

Conclusion

Evaluation of potential impact of adoption of proven improved agricultural technologies on farm by rural household leads to find an assured gain by the farmers in the farm of improved yield quality production, better pecuniary returns and better farm management. Technology generation and adoption is, therefore a farmer welfare venture.

The analysis reveals that adoption of improved agricultural technologies has a direct and significant positive impact on farmers income with production of more food for the consumer. Cost of consumption, however is influenced by several factors.

Rural poverty is directly affected by decline in the rate of productivity growth of agriculture because people of rural area

directly and indirectly depend on agriculture or agriculturally related occupation. Though farmers training program for application of innovative agricultural technology are substantially planned and conducted by research and extension agencies, however the poor illiterate farmers hardly get opportunity to benefit themselves from these due to discriminatory attitude of village level extension workers.

Potential role of agricultural technology in reducing rural poverty through the enhancement of small farmers production capacity has been delineated. Interactions between agricultural technology and other determinants of income would lead to quantify the positive impact of technology adoption on resource less farmers, in terms of rise in income and socio economic empowerment for improvement of quality of life.

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