

Impact of Modern Agricultural Aids on Productivity and Income of Farmers of Selected Talukas of Nanded District

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Abstract: *This paper deals with the impact of modern agricultural aids on socio-economic development of farmers. This paper also discusses various modern agriculture tools, equipments and their effective use for betterment of farmers. Further this paper focused on role of govt. in promoting and motivating farmers toward use of modern methods of agriculture.*

Keywords: Modern Agriculture, Technology, Effective Strategies

I. INTRODUCTION

During the latter half of the twentieth century, what is known today as modern agriculture was very successful in meeting a growing demand for food by the world's population. Yields of primary crops such as rice and wheat increased dramatically, the price of food declined, the rate of increase in crop yields generally kept pace with population growth, and the number of people who consistently go hungry was slightly reduced. This boost in food production has been due mainly to scientific advances and new technologies, including the development of new crop varieties, the use of pesticides and fertilizers, and the construction of large irrigation systems.

Agriculture in India has a significant history. Today, India ranks second worldwide in farm output. The economic contribution of agriculture to India's GDP is steadily declining with the country's broad-based economic growth. Still, agriculture is demographically the broadest economic sector and plays a significant role in the overall socio-economic fabric of India. Indian agriculture has been characterized by many revolutions that changed the very face of this sector. The green revolution, blue revolution, yellow revolution and white revolution have been the important milestones in Indian agriculture. One thing common in all these revolutions was the use of technology. The revolutions could not have occurred without relevant technologies. The modern agricultural aids led agricultural development saw India emerging as world leader in many important food commodities. Our food production which was merely 50 million tonnes at the time of independence has now reached more than 250 million tonnes. Similarly in case of livestock, we are the leading producers of the milk in the world and the largest producers of pulses. While more than 60 percent of the population depends on the agricultural sector, yet the sector also carries the blot of farmers' suicides, high food inflation, the low yields, the climate threat and the still presence of a considerable population in the grip of below poverty line category. This is also happening at a time when we have to achieve the Millennium Development Goals in the near future. Food production has to be increased in the context of worsening land and water scarcity and climate-change-related weather shocks. The problems in agriculture are not confined to a particular territorial jurisdiction. Some of them have now become universal. Land degradation is also another important factor affecting productivity.

Basic Practices of Modern Agricultural Systems: Modern agricultural systems have been developed with two related goals in mind: to obtain the highest yields possible and to get the highest economic profit possible. In pursuit of these goals, six basic practices have come to form the backbone of production: intensive tillage, monoculture, application of inorganic fertilizer, irrigation, chemical pest control, and genetic manipulation of crop plants. Each practice is used for its individual contribution to productivity, but when they are all combined in a farming system each depends on the others and reinforces the need for using the others. The work of agronomists, specialists in agricultural production, has been key to the development of these practices.

II. ORIGIN OF RESEARCH PROBLEMS

“Slow agricultural growth is a concern for policymakers as some two-thirds of India’s people depend on rural employment for a living. Current agricultural practices and use of agricultural aids are neither economically nor environmentally sustainable and India’s yields for many agricultural commodities are low. Poorly maintained irrigation systems and almost universal lack of good extension services are among the factors responsible. Farmers’ access to markets is hampered by poor roads, rudimentary market infrastructure, and excessive regulation.” (World Bank: “India Country Overview 2008”) “With a population of just over 1.2 billion, India is the world’s largest democracy. In the past decade, the country has witnessed accelerated economic growth, emerged as a global player with the world’s fourth largest economy in purchasing power parity terms, and made progress towards achieving most of the Millennium Development Goals. India’s integration into the global economy has been accompanied by impressive economic growth that has brought significant economic and social benefits to the country. Modern Agricultural aids Needs and Future Agriculture: It is apparent that the tasks of meeting the consumption needs of the projected population are going to be more difficult given the higher productivity base than in 1960s. There is also a growing realization that previous strategies of generating and promoting technologies have contributed to serious and widespread problems of environmental and natural resource degradation. This implies that in future the technologies that are developed and promoted must result not only in increased productivity level but also ensure that the quality of natural resource base is preserved and enhanced. In short, they lead to sustainable improvements in agricultural production. Productivity gains during the ‘Green Revolution’ era were largely confined to relatively well endowed areas. Given the wide range of agro-ecological setting and producers, Indian agriculture is faced with a great diversity of needs, opportunities and prospects. Future growth needs to be more rapid, more widely distributed and better targeted.

III. SIGNIFICANCE OF THE STUDY

The research study has significance in measuring the impact of modern agricultural aids on productivity and socio-economic development of farmers, to study the role of Govt in providing financial support through direct financing, re-financing and subsidies, to assess the role of Govt in providing technical guidance consistently available to the farmers at village, block or through mobile/apps and to evaluate the alternative usage of modern Agri aids procured by sample farmers. This research study will help to eradicate rural poverty and foster overall economic development of farmers. The direct effects of new agricultural aids on poverty reduction are the productivity benefits enjoyed by the farmers. These benefits usually manifest themselves in the form of higher farm incomes. These may comprise lower food prices, higher nonfarm employment levels or increases in consumption for all farmers. However, productivity-enhancing agricultural aids involve a bundle of innovations rather than just a single technology. The impacts of higher-order (indirect) benefits from technology adoption depend: depend on the elasticity of demand, outward shifts in supply lowering food prices; and an increased productivity which may stimulate the demand for labour. The poor and marginal farmers tend to supply off-farm labour, which may translate to increased employment, wages, and earnings for them. They have little or no land and they gain disproportionately from employment generated by agricultural growth and from lower food prices. Higher productivity can, therefore, stimulate broader development of the rural economy through general equilibrium and multiplier effects, which also contribute to poverty reduction. Agricultural aids may induce changes in cropping patterns and allocation of farmers’ own resources to different uses. It is important to notice that the technology adoptions may vary from farmer to farmer and the nature of the agricultural aids in use.

IV. OBJECTIVES OF RESEARCH STUDY

1. To measure the impact of modern agricultural aids on productivity and income of farmer.
2. To study the role of Govt in providing financial support through direct financing, re-financing and subsidies.
3. To assess the role of Govt in providing technical guidance consistently available to the farmers at village, block or through mobile/apps.

V. REVIEW OF LITERATURE

1. Mathur and Sharma (2009) studied the role of ICT sector for human development in India by enabling access to information, creation of employment, improving the quality of life, better livelihood opportunities in rural areas, growth of agriculture, and the related issues. ICT has reduced information asymmetry and a gap between rich and poor. The ICT density is continuously moving up in the rural areas facilitating agricultural information to rural people. They discussed relationship of telecom expansion, growth and need for further expansion of ICT in order to meet the rising demand of farm sector, small industries, irrigation, water supply and bank credit mainly to meet out marketing needs.
2. Joshi (2012) discussed the need for application of science and technology in Indian agriculture sector. Its absence is the major cause of declining production, lack of institutional finance, crisis in irrigation facilities, collapsing agriculture extension, problems in agricultural marketing, degradation of land resources and climate change. The major revolution in India constitutes a gene revolution for modifying crops before their commercial use in the market. IT has revolutionized the delivery of extension services in rural India. Study recommended that there should be alliance of business, NGO and government sector to overcome the problems. Internet, mobile telephony, FM radio could be the enabling tools for accessing information related to agro inputs, crop production technologies, agro processing, market support, agro finance, agro clinics and agribusiness through integrated use of these technologies.
3. Mohammad and Garforth (1999) empirically identified the sources of information and their effectiveness on adoption of agricultural information among farmers in Pakistan. Lack of technical knowledge is the prime factor responsible for low productivity in the agriculture production at farm level. Agriculture extension services facilitate farmers to a variety of information sources, which showed farmers interest in farming. The respondents were selected as contact farmers and non contact farmers (CFs). Study found that neighbours/ friends/ relatives (NFRs), radio and print media were the major sources of information as realized by the farmers.
4. Chandrasekhar (2003) discussed the diffusion of information technology in India. In 2001 only 31.5 percent rural Indians and 74.1 percent urban Indians had accessed information through home based or community TV sets by Doordarshan network. Teledensity is a simple measure used to assess the diffusion of information technology that had touched 5 per 100 inhabitants as on 31 March 2003. This growth in connectivity could increase interactive communication between distant centres, allow improved governance through the more well-organized delivery of information and bring in a social change in rural areas as well as get bigger access to the internet and its benefits.
5. Kaushik and Singh (2004) drew some preliminary lessons about information technology and broad based development in north India. In rural India, farmers make important transactions and access to sell their crops and buying inputs, matrimonial alliances for their children and job seekers identified as potential users of internet based matching services. They compared the two ongoing projects namely Tara haat and Drishtie (NGO based models of same geographical and economical location), which are providing information to the rural people.

VI. RESEARCH METHODOLOGY: RESEARCH DESIGN

- **Types of Research Design:** This is Descriptive research study; researcher will try to describe the characteristics of phenomenon being studied under this research study.
- **Data Sources:** Required information will be collected through Primary and Secondary sources. Primary data will be collected from the respondents (farmers) by visiting in person.
- **Research Approach:** Survey method studies the sampling of individual units from a population and the associated survey data collection techniques, such as questionnaire construction.
- **Research Instrument:** Questionnaire/scheduled/Interview/observation: Separate questionnaire for farmers and Agriculture labour will be design to collect the necessary information
- **Types of Questions:** Closed-ended and open ended questions may be asked to the respondents.

- **Sampling Plan:** There are 16 talukas in Nanded district out of which 5 talukas will be selected purposefully based on size of population, development, irrigated and non-irrigated as a sample and there are 320 villages in 5 talukas, from each talukas 10% villages will be selected that is 32 villages will be selected as a sample. For the selection of farmers convenient sampling method will be used. So, conveniently 10 farmers will be selected from sampled villages who posses/hold more than 10 hector of land. It will be 320 farmers.

6.1 Tabulation and Data Interpretation

Table 1: Sampled Talukas

SN	Talukas	Sample
1	Nanded	90
2	Loha	60
3	Ardhapur	60
4	Mukhed	50
5	Kandhar	60
	Total sample	320

Source: Field Survey

Geographically Nanded district has spread over 16 talukas, over FIVE talukas has selected as a sample for this study, form each talukas 5 to 9 villages are selected and from each villages 10 framers has been selected based on land holding patter/capacity and irrigated and non-irrigated land. In total 320 farmers has been selected for this research study.

Table 2: Age: (Years)

	Age	Sample
1	15-25	20 (06%)
2	26-35	25 (08%)
3	36-45	125 (39%)
4	46-55	135 (42%)
5	56-65	15 (05%)
	Total	320

Source: Field survey

Above table shows that, 42% farmers belongs to the age group of 46 to 55 years, 39% farmers are belongs to the age group of 36 to 45 years, 8% farmers are belongs to the age group of 26 to 35 years, 6% farmers are belongs to the age group of 15 to 25 years and 5% farmers are belongs to the age group of 56 to 65 years. From the above it is clear that, a youngster has less involvement in agriculture activity. The age group 56 to 65 year age has shows less involvement due to low productivity.

Table 3: Farming Size: Acres

SN	Farm Size	Sample
1	0-5	17 (05%)
2	6-10	42 (13%)
3	11-15	92 (29%)
4	16-20	85 (27%)
5	21-25	64 (20%)
6	25 and above	20 (06%)
	Total	320

Source: Field survey

Land holding capacity of farmers play significant role in economic development of farmers in India. Due to the division family size land get divided into small piece, as result of this farmers are holding small farming size. Form the research it is seen that, 29 % farmers are holding 11 to 15 acre of land, 27% farmers are holding 16 to 20 Acres of

land, 20% farmers are holding 21 to 20 Acres of land, whereas 13 % , 6% and 5% farmers are holding, 6 to 10, 25 and above and 0 to 5 Acres of land respectively. From the above it is observed that, majority of farmers are holding 11 to 15 Acres of land.

Table 4: Pattern of Cultivation

SN	Cropping Patter	Sample
1	Traditional	276 (86%)
2	Modern	44 (14%)
3	Total	320

Source: Field survey

Since earlier times, traditional farming methods are used. It is the old farming method. Few traditional farming methods are still in use and are popular. Farmers provide cultural and ecological services to human beings by these methods. The traditional method has helped in protecting natural resources, biodiversity maintenance, and enhanced food security. As technology is improving day-by-day and it make farming quick and efficient modern equipment is introduced. Pesticide, fertilizer, herbicide software, and increased seeds can be achieved in agriculture by improved technology. Genetic engineering plays important role in agricultural development. This boosts the resistance of vegetation to droughts and pests. The research shows that, 86% of farmers are using traditional methods of farming and 14% farmers are using modern methods of farming. From this it is clear that, farmers are not taking risk of new pattern or methods and also they are not fully aware of modern methods of farming, new cropping pattern, new technology, new equipment etc.

Table 5: Opinion of farmer about profit after use of modern farming methods

SN	Opinion	Sample
1	Profitable	286 (89%)
2	Average Profitable	34 (11%)
	Total	320

Source: Field survey

Recently, there have been developments in the agriculture industry, ranging from advanced tool to techniques that result into efficient, sustainable environment and better food availability. Quite a number of global trends are influencing the sustainability of agricultural system and food as a whole. The world's population is expected to exponentially continue to rise – increasing the demand for agricultural produce. Based on this facts research shows that, 89% farmers are in the opinion that, modern farming methods are good in terms of benefits and profits where as 11% farmers are in the opinion that modern farming methods will earn average profits.

Table 6: Opinion of farmer about productivity improvement due to modern farming cultivation methods

SN	Opinion	Sample
1	Yes	67 (21%)
2	No	253 (79%)
	Total	320

Source: Field survey

Agricultural productivity may also be measured by what is termed total factor productivity (TFP). This method of calculating agricultural productivity compares an index of agricultural inputs to an index of outputs. In this research inputs are considered the best use of modern equipment, tools, advanced seeds, organic fertilizer, pesticides etc for better productivity compared to traditional farming methods. Increasing agricultural productivity through sustainable practices can be an important way to decrease the amount of land needed for farming and slow environmental degradation and climate change through processes like deforestation. Research shows that, 21% farmers are agrees that modern farming methods always better and good in case of productivity. From this it is clear that very few farmers are aware and experienced about modern farming methods.

Table 6: Social and economic change due to modern farming methods

SN	Opinion	Sample
1	Yes	69 (22%)
2	No	251 (78%)
	Total	320

Source: Field survey

Above table indicated that 22% farmers are agree and believes that if the use modern farming method there will be change in the socio-economic condition. It is clear that, 78% farmers are not much aware about the modern farming methods. Hence there is need to educate the farmers for best use of modern farming methods to change the socio economic status of farmers.

Table 7: Level of awareness about govt. support in promoting modern farming

SN	Option	
1	YES	53 (17%)
2	NO	267 (83%)

Source: Field survey

Use of any modern method/techniques is depends upon the level of awareness created by government and private companies, the government has to initiate major role in promoting awareness regarding the use of modern aids for better productivity. From this research it is observed that, 83% farmers are opined that are not aware about the govt. Support in promoting modern farming. From this it is concluded that, farmer has to take certain measure to create awareness level among them, they should not depends on other in this modern era.

Table 8: Opinion of farmers regarding role of Government in providing financial support

SN	Option	Count (%)
1	YES	37 (12%)
2	NO	283 (88%)

Source: Field survey

From the above table it is observed that, 88% e farmer opined that, government has not taken any major role in promoting and providing financial support to the farmer who is adopting new and modern farming method.

Table 9: Opinion of farmers regarding role of Government support in providing technical support

SN	Option	Count (%)
1	YES	09 (03%)
2	NO	311 (97 %)

Source: Field survey

From the above table it is observed that, 97% e farmer opined that, government has not taken any major role in promoting and providing technical support to the farmer who is adopting new and modern farming method.

VII. FINDINGS, SUGGESTIONS AND CONCLUSIONS

1. Geographically Nanded district has spread over 16 talukas, over FIVE talukas has selected as a sample for this study, form each talukas 5 to 9 villages are selected and from each villages 10 framers has been selected based on land holding patter/capacity and irrigated and non-irrigated land. In total 320 farmers has been selected for this research study.
2. Research shows that, 42% farmers belongs to the age group of 46 to 55 years, 39% farmers are belongs to the age group of 36 to 45 years, 8% farmers are belongs to the age group of 26 to 35 years, 6% farmers are belongs to the age group of 15 to 25 years and 5% farmers are belongs to the age group of 56 to 65 years. From the above it is clear that, a youngster has less involvement in agriculture activity. The age group 56 to 65 year age has shows less involvement due to low productivity.
3. Research highlighted that, the nature of the work differs according to the size and type of farm. The topography, climate and vegetation of an area determine the type of farming practiced. On small farms, farmers may perform

the actual labour, as well as plan and direct farming operations. Above table indicated that, 57% farmers are engaged in agricultural activity as their main occupation, 23% farmers are doing farming as well as wage earner, 12% farmers are doing farming and business and 8% farmers are doing farming and Job. From the above it is seen that, majority of farmers are busy in farming activity as their main occupation and other farmers are doing dual activity, may be due to less land holding capacity and survival is not possible only on farming.

4. From the above table it is observed that, 97% e farmer opined that, government has not taken any major role in promoting and providing technical support to the farmer who is adopting new and modern farming method.
5. From the above table it is observed that, 88% e farmer opined that, government has not taken any major role in promoting and providing financial support to the farmer who is adopting new and modern farming method.

VIII. CONCLUSION

Indian agriculture is a source of livelihood for more than two-thirds of the Indian population. But the Indian agricultural system before and after independence was not as strong as it is today. Hence the production was not enough to meet the demand for food with the growing Indian population. After that, the Green Revolution was the major success story of Indian agriculture in which some modern farming methods were used. This was the reason that the nation often suffered from famine and various food shortages before the Green Revolution and today we are in a situation where we are challenged with the problem of surplus.

Today with the development of various agricultural technologies/systems that include organic farming, genetic manipulation of crop plants, use of vertical farming, precision farming (PA), etc., this increases crop production with India and the current issues in agricultural production faces the demand for world present and future food. Agriculture is the backbone of our country, which is likely to contribute to the Indian economy. India is a country with varying environmental conditions in a single year and hence India's agriculture is made up of many crops, with rice and wheat being the primary food staples. Indian farmers also grow cereals, pulses, tubers, sugarcane, oilseeds, and non-food items like cotton, tea, coffee, rubber, and jute.

However, it was observed that the presentations of these crops are challenged by various biological and a biotic stresses, water availability, and growing global populations. Increasing grain yields per unit area is therefore an important solution to overcome or resolve the contradiction between consumer demand and world food supply, which is projected to increase by 25% or more by 2030. There are many areas of technology and modern system in India, gradually the Indian Agricultural Green Revolution is undergoing a change from the beginning of technology.

The present study focuses on level of adoption, access of farmers to farm technology, new cropping pattern, quality of modern technology, access to agricultural extension institutions and problems faced by extension officials in transfer of farm technology. It has been observed that the coverage of agricultural development programmes is limited to few villages; however, line department still dominates in spreading of modern agricultural technology. Mandate given to newly created institutions (ATMA and KVK) is still limited for few activities. Adoption level of artificial insemination is comparatively high due to active participation of co-operatives and private sector in Maharashtra.

Very few farmers adopt advanced horticulture and modern crop seeds in Nanded district. Small size of land holding and fragmented land emerged as main constraint to adoption of modern horticultural technology in Nanded. While analyzing use of modern varieties of main crops, a comparatively high level of adoption on small and medium farms was observed. Hence, there is no relationship between size of farm and adoption of modern varieties of seeds in Nanded. However, the majority of farmers are still using degenerated seeds of main crops mainly due to non-availability of quality seeds in the market.

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