

Impact of Modern Agricultural Aids on Socio-Economic Development 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 discuss how modern farming helps farmer in developing socio economic condition. This paper also covers the occupation pattern, farming size, income level, modern cropping and their purchasing pattern.*

Keywords: Modern Agriculture, Technology, Effective Strategies, harvesting, cropping pattern

I. INTRODUCTION

Agriculture farming in India is a century-old activity, and is currently the highest contributor to the GDP of India. The Government of India has set a target under its Agriculture Export Policy to increase the agricultural export to over \$60 billion by 2022. This means, the agricultural activity in India will be doubling. If we describe the farmers of India, they constitute 58% of the country's population. Agriculture is the primary source of income for the mentioned percentage of the population. The Indian food industry is set to grow in the near future by contributing towards the world food trade every year. Moreover, the Indian food and grocery market are the sixth-largest in the world. Additionally, Indian Food Processing covers 32% of the total food market of the country. This overall shows that both traditional and commercial agriculture in India is the major contributor towards the GDP and livelihood of farmers.

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.

III. 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.

IV. 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 fostering 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 involves 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.

V. OBJECTIVES OF THE STUDY

1. To study the impact of modern agricultural aids on socio-economic development of farmers in Nanded district.
2. To study the modern cropping practices adopted by the farmers in Nanded district

VI. REVIEW OF LITERATURE

In order to fulfil the set objectives of the study, it is pertinent to review of the available literature on the related research papers, articles and book of the present study. The basic purpose of the review is to make the attempt to refer possible all available literature on the research title. It is observed that very few academician, educationist, researcher have extensively and excellently reviewed both Indian and Foreign literature on the topic. The review indicates very high degree of conceptualization in the given circumstances on the one hand and on the other hand a marked absence of the experimental literature on the research topic. The review of literature is intended to the present the existing status of modern techniques, methods of agricultural practices and also intends the gap in the study. This chapter also deals with research methodology in detail. The entire review and research methodology has been done as below:

1. **Rao (2005)** discussed the overview of several ICT initiatives in India which were providing diversified services to the people such as reservation, prices of agricultural inputs and outputs, market services (export potential etc.), governments information, banking, health care, transport, weather etc.
2. **Patil et al (2008)** evaluated the main constraint in the adoption of ICTs and information needed by farmers, extension agents and research personal. Integration of information technology, agriculture and cyber revolution can alleviate significant strides in the development. The study evaluated several factors of ICTs use in context with farmers, extension workers and research personal. Unfamiliarity with technology, lack of training and illiteracy were the main barriers in effective decision making. They also identified several limiting factors such as poor infrastructure, insufficient power supply, telecommunication and ICT maintenance facilities etc.

3. **Harender Raj Gautam and Rohitashw Kumar** (2014) discussed the agriculture need technology infusion to accelerate the production. According to 'The State of Food and Agriculture 2013' of the Food and Agriculture Organization (FAO) of the United Nations, 12.5 percent of the world's population (868 million people) are undernourished in terms of energy intake. Further he suggested using biotechnology, nanotechnology, and protected technology, Use of Modern Irrigation Methods, Farm Mechanization and Modernize Technology Transfer Tools to increase the agricultural productivity.
4. **Sabita Kumari (2014)** highlighted the new technologies are needed to push the yield frontiers further, utilize inputs more efficiently and diversify to more sustainable and higher value cropping patterns. These are all knowledge intensive technologies that require both a strong research and extension system and skilled farmers but also a reinvigorated interface where the emphasis is on mutual exchange of information bringing advantages to all. At the same time potential of less favoured areas must be better exploited to meet the targets of growth and poverty alleviation.
5. **Praveen Kumar (2014)** he quoted that, 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 technological led agricultural development saw India emerging as world leader in many important food commodities.

From the above it is clear that, many research studies have been conducted on various issues and problems of agriculture sector. The main focus of researcher was ICT. More or less some research study is available in the form of research paper and article. Use of modern technology in agriculture remains uncovered. Hence researcher is interested to conduct research study on the measure impact of modern technology on agriculture productivity and socio-economic development of farmers in Nanded district of Maharashtra.

VII. 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.

Table 1: Tahsil-wise List of villages in Nanded district, Maharashtra, India

Sr.	Tahsil/Taluka	Total Villages	10% villages from each Taluka	10 farmers from each village
1	Ardhapur	56	06	60
2	Mudkhed	54	05	50
3	Nanded	85	09	90
4	Loha	125	06	60
5	Kandhar	123	06	60
	Total villages	443	32	320

Source: Nanded Census report 2011

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: Occupation

SN	Occupation	Sample
1	Farming only	183 (57%)
2	Farming and Wage earner	72 (23%)
3	Farming and Business	39 (12%)
	Farming and Job	26 (08%)
	Total	320

Source: Field Survey

Farmers combine agricultural and business methods in operating small or large farms. Farmers' objectives are to make farming activities productive, profitable and professional. 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.

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: Annual Income from Agriculture (Rs.) *

	Income (Rs)	Sample
1	Up to 50000	11 (3.43%)
2	5000-100000	17 (5.31%)
3	1-2 Lakh	56 (17.5%)
4	2-3 Lakh	62 (19.37%)
5	3-4 Lakh	50 (15.62%)
6	4-5 Lakh	24 (7.50%)
7	5-6 Lakh	22 (6.87%)
8	10 and above Lakh	58 (18.12%)
9	20 and above Lakh	20 (6.25%)
	Total	320

Source: Field Survey

As per a National Sample Survey Office (NSSO) study, Situation Assessment Survey of Agricultural Households, in 2013, the average monthly income of farmers stood at Rs 6,426. In 2016-17, it reached Rs 8,931, showed a survey conducted by NABARD, marking an increase of only Rs 2,505 between 2012-13 and 2016-17. From this research it is observed that incomes of farmers are depends on farming size and weather condition. No farmer can estimate the income based on health of the crop and farming size. It is highly volatile in nature. Research shows that, 19% farmers are earning average income of Rs. 2 to 3 Lac incomes from agriculture as a source of income as small segment farmer where as 18% farmers are earning average income of Rs. 10 Lac and above as big segment farmer.

Table 5: 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 6: Following are the New Modern Crop cultivated by farmers

SN	Types of Crops	No of farmers	Expenses per Acre	Harvesting period	Yield per Acre	Profit
1	Geranium	08	1 Lac	Four Time	6 Lac	5 Lac
2	Strawberry	02	3 Lac	Twice	8 Tonnes @ 250/-	7 Lac
3	Apple	01	60,000/-	Yearly	6 Lac	5 Lac
4	Dragon fruit	01	1 Lac	25 years	5 to 6 Lac	4 to 5 Lac
5	Papaya	04	1 Lac	8 to 9 Month	1000 @ 500/- per plant	4 Lac
6	Lichi					
7	Silk	15	30000	3 Month	2.5 to 4 Lac	
8	Guava	02	1 Lac	Twice	Avg. 15 Tonnes @ 30/-	7 to 8 Lac
9	Chico	02	50000/-	Twice	6 Tonnes @ 25/-	3 to 4 Lac
10	Muskmelon	03	75000/-	4 Month	12 to 14 Tonnes @ 25/-	
11	Watermelon	02		4 Month	20 Tonnes @ 25/-	4 to 5 Lac
12	Pomegranate	02	1.5 Lac	Twice	4 Tonnes @ 50/-	
	Total	42				

Modern agriculture brings enormous economic and social benefits to farmers and consumers. The major threat to modern agricultural development comes from lack of interest and willingness and awareness to invest by farmers. Researchers has studied above new cropping and harvesting methods, it is observed that, above mentioned crops and fruits gives more benefits compared to traditional cropping methods. As researcher I believed that modern farming methods gives best output and benefits to the farmers. So farmer should adopt modern methods.

Table 7: Types of Vehicle purchased

SN	Types of Vehicle	Sample
1	Two wheeler	191(59%)
2	Four wheeler	16 (05%)
3	Three wheeler	12 (4%)
4	Both 1 and 2	47 (15%)
5	No vehicle	54 (17%)
	Total	320

Source: Field Survey

Above table highlighted that, 59% farmers purchased two wheelers, 5% farmers purchased four wheelers, 4% farmers purchased three wheeler vehicle for commercial purpose and 15 farmers are having two wheeler and four wheeler both whereas 17% farmers do have any vehicle. It shows that, farmers are utilising their surplus income for purchasing vehicles for personal and commercial use.

Table 8: Types of articles purchased by farmer in last 5 year

SN	Articles	Yes/ No (tick)
1	TV	46 (14%)
2	LED	31 (09%)
3	Freeze	35 (11%)
4	Computer	08 (03%)
5	Laptop	06 (2%)
6	Android Mobile /Screen Touch	87 (27%)
7	Land	09 (03%)
8	Tractor	21 (07%)
9	Farming Equipment if any:	43 (13%)
10	Simple mobile	34 (11%)

Source: Survey

From the above table it is indicates that, farmers Scio-economic condition and their lovely hood is depends on agriculture and agriculture yield is depends on nature and rain fall. When farmers start purchasing valuable, durable product it seems that, farmer's economic condition is good and progressive.

7.1 Finding of the Study: Followings are the Main Findings of the Research

1. 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.
2. 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.
3. As per a National Sample Survey Office (NSSO) study, Situation Assessment Survey of Agricultural Households, in 2013, the average monthly income of farmers stood at Rs 6,426. In 2016-17, it reached Rs 8,931, showed a survey conducted by NABARD, marking an increase of only Rs 2,505 between 2012-13 and 2016-17. From this research it is observed that incomes of farmers are depends on farming size and weather condition. No farmer can estimate the income based on health of the crop and farming size. It is highly volatile in nature. Research shows that, 19% farmers are earning average income of Rs. 2 to 3 Lac incomes from agriculture as a source of income as small segment farmer where as 18% farmers are earning average income of Rs. 10 Lac and above as big segment farmer.
4. 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.

5. Modern agriculture brings enormous economic and social benefits to farmers and consumers. The major threat to modern agricultural development comes from lack of interest and willingness and awareness to invest by farmers. Researchers has studied above new cropping and harvesting methods, it is observed that, above mentioned crops and fruits gives more benefits compared to traditional cropping methods. As researcher I believed that modern farming methods gives best output and benefits to the farmers.
6. Above table highlighted that, 59% farmers purchased two wheelers, 5% farmers purchased four wheelers, 4% farmers purchased three wheeler vehicle for commercial purpose and 15 farmers are having two wheeler and four wheeler both whereas 17% farmers do have any vehicle. It shows that, farmers are utilising their surplus income for purchasing vehicles for personal and commercial use.
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VIII. CONCLUSION

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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