International Journal of Academic Research
P-ISSN: 2348-7666: Impact Factor: 7.215
Homepage: https://www.ijar.org.in/
Volume-13, Issue-3, July-Sep-2026

Research Article

Impact of Technological Changes on Cropping Pattern of Karimnagar District

Kanthaiah Garise

Research Scholar, Department of Economics, Satavahana University, Karimnagar.
Corresponding Author: Kanthaiah Garise.

Abstract
Agriculture is the backbone of the economic structure of Telangana. Most of the people of the State are cultivators who earn their living by cultivating the lands of their fore-fathers. In order to increase the production of the agricultural goods, the Government of Telangana has established a separate Department of Agriculture to extend a helping hand to the farmers of the State. The department imparts modern technical knowledge to the farmers to enhance the agricultural productivity. Telangana is blessed with a suitable weather to produce varieties of crops. The farmers of Telangana practice multiple cropping patterns to increase the growth of the agricultural production. Keeping this in view, the present study is relating to the impact of technological changes on cropping pattern in the selected area, it is pertinent to discuss about the technological changes on cropping pattern in general and the State of Telangana in particular. The main objective of the study is to examine the pattern of growth of food and non-food crops during the pre and post globalization period and to assess the relationship between technological interventions and changes in cropping patterns. This study is primarily based on the data gathered from primary as well as various secondary sources, especially those related to the availability of statistical information pertaining to technological changes on cropping pattern.
Keywords: Cropping pattern, Technological changes, Food and Non-food crops.

Introduction:

The cropping pattern in India has undergone significant changes during the period of planning (particularly during the last four decades). First, with the introduction of new technology during the mid-1960s, area under wheat has increased both in absolute and relative (share of total cropped area) terms. Second, area under coarse grains and pulses has considerably shrunk. Third**,** with the launching of the Technology Mission on Oilseeds during the mid-1980s, the area under oilseeds expanded significantly (Gulati and Kelly 1999). In fact, from mid-1980s to early 1990s; there was a marked shift in favour of oilseeds as the pressure of edible oil imports forced a conscious decision on the part of the government to achieve self-sufficiency in edible oils by 1990. For this purpose, domestic market prices of oil seeds were substantially pushed up. India achieved a position of near self-sufficiency in edible oils by 1992-93, when its imports of edible oils came down to almost a fraction of what they were in the mid-1980s. During this period, about 7 million hectares of additional area came under oil seeds, partly from kharif fallows partly from crop intensification and a substantial portion through crop substitution. The shift was largely from coarse cereals, but in some pockets even pulses and wheat gave way to oil seeds.

Cropping patterns can be of various kinds. The important cropping patterns are: Sole cropping, double cropping, Rotational cropping, mixed cropping and Intensive cropping. It can be of two types multiple cropping and Inter-cropping. The technical development and growth of population has interrelationship. The rate of population growth may affect agriculture and the value productivity of agricultural resources. Population growth for a nation as a whole may interact with the technical advance to cause resource return to decrease.

Agriculture is the backbone of the economic structure of Telangana. Most of the people of the State are cultivators who earn their living by cultivating the lands of their fore-fathers. In order to increase the production of the agricultural goods, the Government of Telangana has established a separate Department of Agriculture to extend a helping hand to the farmers of the State. The department imparts modern technical knowledge to the farmers to enhance the agricultural productivity. Telangana is blessed with a suitable weather to produce varieties of crops. The farmers of Telangana practice multiple cropping patterns to increase the growth of the agricultural production. Keeping all these facts in view, it is very much pertinent to throw light on its impact of technological changes on cropping pattern in Telangana.

The objectives of the study are as follows:

i. to examine the pattern of growth of food and non-food crops during the pre and post globalization period;
ii. to examine the factors that affect the cropping pattern in the selected area; and
iii. to assess the relationship between technological interventions and changes in cropping patterns.

The research design adopted for the study is to examine the impact of technological changes on cropping pattern in the sphere of agriculture. For this, the research design adopted in the study is an analytical one where both data from primary as well as secondary sources had been collected. Karimnagar Division and Huzurabad Division of the Karimnagar District had been chosen for the present study.The stratified random sampling method had been adopted for the selection of villages. In view of the research design adopted for the study, a sample design had been worked out for the present study. The stratified random sampling frame had been adopted while selecting the sample farmers in the study area. In each village 50 sample households have been chosen at random. Altogether, three mandals, six villages and 300 sample households had been selected for the present study.

Results and Discussion:

to examine the impact of technological changes on cropping pattern in the sphere of agriculture and the sample respondents in particular had been ascertained through the collection of primary data during the field investigation in the six villages of the three mandals of Karimnagar District.

Table-1: Category of the Farmers

Category	Huzurabad	Choppadandi	Ramadugu	Total
Big Farmer	24 (8.0)	31 (10.3)	13 (4.3)	68 (22.7)
Medium Farmer	47 (15.7)	40 (13.3)	36 (12.0)	123 (41.0)
Small Farmer	21 (7.0)	21 (7.0)	33 (11.0)	75 (25.0)
Marginal Farmer	8 (2.7)	8 (2.7)	18 (6.0)	34 (11.3)
Total	100 (33.3)	100 (33.3)	100 (33.3)	300 (100.0)

Source: Field Study

Table-1 throws light on various groups of the farmers in the selected area. It is observed that in the entire study areas, out of 300 respondents, 123 members i.e. 41 per cent belong to medium farmers and another 25 per cent i.e. 75 members were from middle level categories of farmers in the entire sample representing the selected areas of the study. On the other, we could find 68 big farmers i.e. nearly 22.7 per cent in the entire sample and only 11.3 per cent i.e. 34 members are marginal farmers representation in the sample is less, whereas proportion of small and medium farmers are found to be good in number.

Table-2: Village-wise of Respondents as per the Nature of Change in Cropping Pattern

Village	Nature of Change in the Cropping Pattern					Total
	No Change	Subsistence to Food	Food to Commercial	Food to Plantation	2+3	
Kothapally	2 (4.0)	14 (28.0)	28 (56.0)	6 (12.0)	-	50 (100.0)
Darmarajpally	-	10 (20.0)	24 (48.0)	-	16 (32.0)	50 (100.0)
Arunakonda	-	22 (44.0)	24 (48.0)	-	4 (8.0)	50 (100.0)
Kolimikunta	-	12 (24.0)	38 (76.0)	-	-	50 (100.0)
Ramadugu	3 (6.0)	3 (6.0)	44 (88.0)	-	-	50 (100.0)
Sriramulapally	-	8 (16.0)	42 (84.0)	-	-	50 (100.0)
Total	5 (1.6)	69 (23.0)	200 (66.6)	6 (2.0)	20 (6.6)	300 (100.0)

Source: Field Study

Village-wise of the sample respondents as per the nature of change in the cropping pattern has shown in Table-2. Of the 300 total sample respondents, an overwhelming majority of the respondents i.e. 66.6 per cent stated the cropping pattern has changed from food to commercial crops followed by subsistence to food crops with 23.0 per cent, subsistence to food and food to commercial with 6.6 per cent and food to plantation crops with 2 per cent. Data in the Table reveals the fact that a majority of the respondents stated that the cropping pattern had undergone change that is from food crops to commercial crops. During the field investigation and held discussions with the cross section of the households, the researcher had also observed that the cropping pattern has shifted from food to commercial crops.

Table- 3: Opinion on the technological changes in sustainable in the long term

Opinion	Ramadugu	Choppandandi	Huzurabad	Total
Yes	75 (25.0)	71 (23.6)	65 (21.6)	211 (70.2)
No	25 (8.3)	29 (9.7)	35 (11.7)	89 (29.8)
Total	100 (33.3)	100 (33.3)	100 (33.3)	300 (100.0)

Source: Field Study

Distribution of the sample respondents as per the technological changes are sustainable in the long term had been presented in Table. Out of 300 respondents**,** 211 respondents (70.2 per cent) expressed the opinion that technological changes are sustainable in the long term, whereas 89 respondents (29.8 per cent) disagreed with this view. This indicates that a significant majority of the respondents have confidence in the long-term sustainability of technological advancements. A closer examination of the data shows that Ramadugu recorded the highest number of respondents who agreed with the statement, with 75 respondents (25.0 per cent)**,** followed by Choppadandi with 71 respondents (23.7 per cent)**,** and Huzurabad with 65 respondents (21.7 per cent)**.** This suggests that positive perceptions regarding the sustainability of technological changes are prevalent across all three regions. Among those who disagreed, Huzurabad had the highest number of respondents **(**35**),** followed by Choppadandi **(**29**)** and Ramadugu **(**25**).** Although a notable minority expressed concerns about the long-term sustainability of technological changes, their proportion remains considerably lower than those expressing positive views.

Table-4: Distribution of Sample Respondents by Major Challenges in Adopting New Technologies

Major Challenges	Ramadugu	Choppandandi	Huzurabad	Total
High Cost	35 (11.7)	30 (10.0)	25 (8.3)	90 (30.0)
Lack of Awareness/Training	25 (8.3)	28 (9.3)	22 (7.3)	75 (25.0)
Lack of Technical Support	15 (5.0)	16 (5.3)	19 (6.3)	50 (16.7)
Poor Access to Credit	12 (4.0)	14 (4.7)	14 (4.7)	40 (13.3)
Minimum Price Support	13 (4.3)	12 (4.0)	20 (6.7)	45 (15.0)
Total	100 (33.3)	100 (33.3)	100 (33.3)	300 (100.0)

Source: Field Study

Distribution of sample respondents by major challenges in adopting new technologies had been presented in Table-4. The table reveals that high cost (30.0%) is the most significant challenge faced by farmers in adopting new technologies, followed by lack of awareness/training (25.0%)**.** Issues related to minimum price support (15.0%)**,** lack of technical support (16.7%)**,** and poor access to credit (13.3%) also hinder technology adoption. Ramadugu respondents reported the highest concern regarding high costs, while Huzurabad respondents expressed relatively greater concern about minimum price support. Overall, economic constraints and inadequate knowledge emerge as the major barriers to the adoption of agricultural technologies. The study indicates that economic constraints, particularly high costs, and inadequate awareness and training are the most significant barriers to the adoption of new technologies among farmers**.** Therefore, efforts should focus on reducing technology costs, enhancing training programs, strengthening technical support systems, improving access to institutional credit, and ensuring effective price support mechanisms to promote wider adoption of agricultural technologies.

By and large, it can be said that many suggestions for improving technological adoption and support in agriculture offered by the sample respondents during the field work are: enhancing extension services, and promoting sustainable technological solutions, strengthen farmer training and awareness programs, provide financial support and subsidies, improve

market linkages and information systems. Of these suggestions, enhancing extension services, and promoting sustainable technological solutions are the predominant suggestions. Thus, from the above analysis, it can be surmised that the sample respondents had suggested many steps to be taken for improving technological adoption and support in agriculture in the study area.

Therefore, it can be surmised that if at all the following measures are undertaken, the agricultural system may have the sustainability. They are:

1. Crop rotations will also be undertaken that mitigate weed, disease and insect problems, increase soil productivity and minimize soil erosion
2. Soil and water conservation must be taken up to prevent degradation of soil productivity
3. Efficient use of limited irrigation water without leading to problems of soil salinity, alkalinity may be taken up.
4. Integrated pest management should also be taken up that reduces the need for agrochemicals by crop rotation, weather monitoring, use of resistant cultivar, planting time and biological pest control.

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Citation: Kanthaiah Garise. 2026. "Impact of Technological Changes on Cropping Pattern of Karimnagar District". International Journal of Academic Research, 13(3): 87-91.