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Crop Diversification Pattern: A Case Study Of Telangana State

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Abstract :- **Patterns of crop diversification of modern agricultural technology, especially during the period of the Green Revolution in the late sixties and early seventies, there is a continuous surge for diversified agriculture in terms of crops, primarily on economic considerations. Indian agriculture is increasingly getting influenced more and more by economic factors. This need not be surprising because irrigation expansion, infrastructure development, penetration of rural markets, development and spread of short duration and drought resistant crop technologies have all contributed to minimizing the role of non-economic factors in crop choice of even small farmers. What is liberalization and globalization policies are also going to further strengthen the role of price related economic incentives in determining crop composition both at the micro and macro levels. Obviously, such a changing economic environment will also ensure that government price and trade policies will become still more powerful instruments for directing area allocation decisions of farmers, aligning thereby the crop pattern changes in line with the changing demand-supply conditions. In a condition where agricultural growth results more from productivity improvement than from area expansion, the increasing role that price related economic incentives play in crop choice can also pave the way for the next stage of agricultural evolution where growth originates more and more from value- added productions.**

Keywords: *crop diversification, Green Revolution, infrastructure development, liberalization, globalization, agricultural growth.*

I. INTRODUCTION

Agriculture is an important sector in Telangana state economy. It contributed 13 per cent to the state income. Nearly 56 per cent of population in the state is depending on agriculture. It has the net cropped area of 5.12 million hectares and nearly 56 per cent of the area is irrigated by various irrigation sources. It has seven agro climatic zones which are suitable for various crops. Crop diversification is helpful for sustainability of agriculture. Mono cropping affects soil health and creates biotic and abiotic stress to the soil. Introduction of green revolution in late 60's and early 70's to meet the food shortage in the country had adversely affected the cropping pattern in the country. Introduction of fertiliser responsive and high yielding varieties in rice and wheat had converted many states as a mono crop state. After attaining self sufficiency in foodgrain production central and State Government introduced many schemes to diversify cropping pattern to maintain food security. The crop composition further changed by the changes in prices, rainfall and labour availability. In this context, it is necessary to study the status crop diversification after forty years of green revolution. Hence, the objective of the study is to measure the crop diversification over the years in the State. Crop diversification implies cultivation of a variety of crops in a region. Greater the number of crops in combination, greater will be the degree of diversification. In late sixties and early seventies during the period of the Green Revolution, there is a continuous surge for diversified agriculture in terms of crops, due to the expansion of irrigation facilities, infrastructure development, penetration of rural markets, development and spread of short duration and drought resistant crop technologies made crop choice of farmers in rural areas. Household related factors covering food and fodder self-sufficiency requirement as well as investment capacity, Price related factors covering output and input prices, Institutional and infrastructure related factors covering farm size and tenancy arrangements and further liberalization and globalization policies are also changed the crop diversification at micro and macro levels. It gives wider choice to produce variety of crops to lessen the risk in the areas of Drought or with distinct soil problem. Crop substitution and shift are also taking place in the areas with distinct soil problems. For example, the growing of rice in high water table areas replacing oilseeds, pulses and cotton; promotion of soyabean in place of sorghum in vertisols (medium and deep black soils) etc. An attempt is made here to study the crop diversification in Telangana state by employing S.C Batia crop diversification method. The spatial variations and reasons for such variations of district level are also brought to light, the study of crop diversification is necessary to understand the competition that exists among crops in a region as well as the crop geography in different environmental and economic situations.

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II. OBJECTIVES

1. To study Crop Production and Economics Scenario
2. To identify Crop Diversification in the Telangana Perspective
3. To examine Pattern of Crop Diversification in Telangana.

III. LOCATION OF STUDY AREA

Telangana State is southern part region of India. It has an area of 114,840 sq.kms. It is located with a 17. 36 60 N, 78.47.60 E.

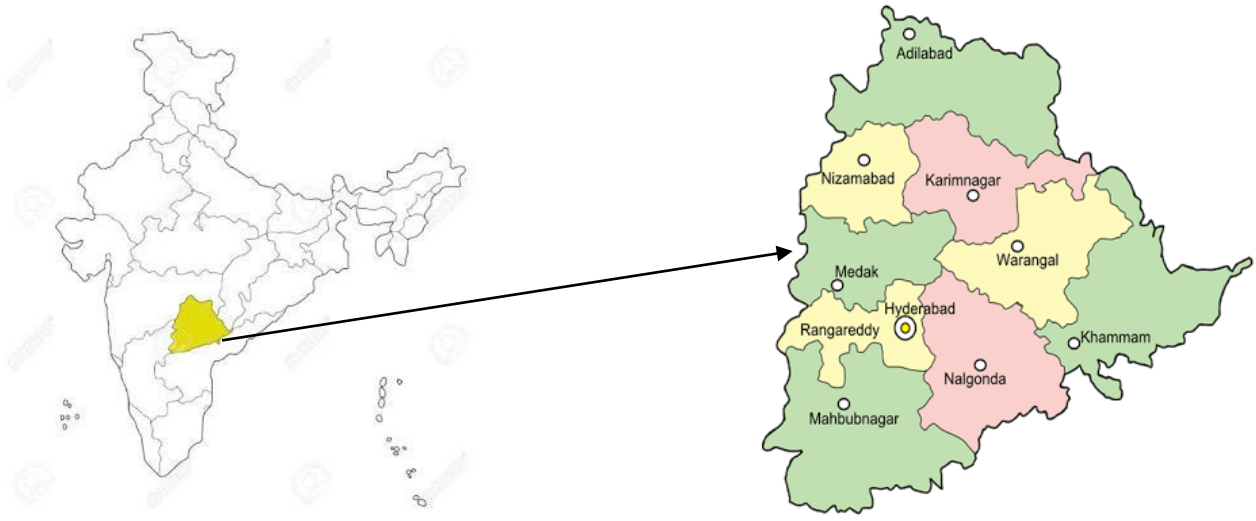

Fig 1. Location Map Of Study Area

IV. EARLIER STUDIES ON DIVERSIFICATION

The study suggested the establishment of agro processing industries and infrastructural facilities, arrangement for crop protection, construction, maintenance and management of irrigation works, research prioritization, distribution of quality seeds and seed materials of the specific crops in the specific zone on the basis of cropping pattern and need of the people of the region. The study suggested that for achieving the gains of diversification of farming, there is an urgent need for further strengthening the required infrastructure pertaining to input supply system marketing system and the existing research and extension programmers to increase the adoption of advanced production technologies. In their study on the impact of diversification on small farms economy district of Himachal Pradesh observed that the diversification of arable farming systems with commercial enterprises such as high yielding milk animals, poultry birds, bee-keeping, floriculture etc, resulted in a marked increase in the farm income from 6 to 138 per cent. Similarly, the capital and credit requirement showed an increasing trend with the extent of diversification implying thereby that to diversify the existing farming systems with the most systematically, remunerative and technically feasible enterprises, adequate facilities should be made available by the financial institutions.

V. CONSEQUENCES OF CROP PATTERN CHANGES

Turning now to the Socio-economic and environmental consequences of crops pattern changes the Green Revolution technologies have fomented, among other things, an increasing tendency towards crop specialization and commercialization of agriculture. While these developments have positive effects on land/labor productivity and net farm income, they have also endangered a number of undesirable side effects like reduced farm employment and crop imbalances. Besides, crop pattern changes also lead to serious environmental consequences that take such forms as groundwater depletion, soil fertility loss and water logging and salinity- all of which can reduce the productive capacity and growth potential of agriculture over the long-term.

VI. Crop Diversification in the Indian Perspective

With the advent of modern agricultural technology, especially during the period of the Green Revolution in the late sixties and early seventies, there is a continuous surge for diversified

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agricultural in terms of crops, primarily on economic considerations.

1. Resource related factors covering irrigation, rainfall and soil fertility.
2. Technology related factors covering not only seed, fertilizer, and water technologies but also those related to marketing, storage and processing.
3. Household related factors covering food and fodder self-sufficiency requirement as well as investment capacity.
4. Price related factors covering output and input prices as well as trade policies and other economic policies that affect these prices either directly or indirectly.
5. Institutional and infrastructure related factor covering farm size and other economic policies that affect these prices either directly or indirectly.
6. Institutional and infrastructure related factors covering farm size and tenancy arrangements, research, extension and marketing systems and government regulatory policies.

Obviously, these factors are not watertight but inter-related. For instance, the adoption of crop technologies is influenced not only by resource related factors but also by institutional and infrastructure factors. Similarly, government policies-both supportive and regulatory in nature-affect both the input and output prices. Likewise, special government programmers also affect area allocation and crop composition. More importantly, both the economic liberalization policies as well as the globalization process are also exerting strong pressures on the area allocation decision of farmers, essentially through their impact on the relative prices of inputs and output. Similarly, economic factors play a relatively stronger role in influencing the crop pattern in areas with a better irrigation and infrastructure potential. In such areas, commercialization and market networks co-evolve to make the farmers more dynamic and highly responsive to economic impulses

VII. METHODOLOGY

In the present study, an attempt has been made to analyze the changing scenario of agricultural crop diversification in Telangana State. The study is empirical in nature and is based on secondary data. The required data for the year 2006-07, 2011-12 and 2014-15 have been obtained from various Statistical books and Handbooks of Telangana and Andhra Pradesh state.

Bhatia's method for Demarcating Crop Diversification Regions

$$\text{Index of Crop Diversification} = \frac{\text{Total cropped area Under x Crops}}{\text{Number of 'x' Crops}}$$

Where 'X ' stands for those crops which individually occupy is the percentage of total cropped percent or more of the total cropped area.

VIII. RESULTS AND DISCUSSION

The district-wise pattern of diversity on the basis of 10 crops reveal that most of the districts fall under the category of high diversification producing number of crops. Spatial pattern of crop diversification in the state is clustered into high-, medium- and low-diversification Zones. A spatial view of these zones is shown in graph.

Table I. Crop Diversification in Telangana State during 2006, 2011 and 2015

Sl. No	District	Crop Diversification 2006-07	Crop Diversification 2011-12	Crop Diversification 2014-15
1	**Mahaboobnagar**	13.38	16.37	17.19
2	**Rangareddy**	18.43	17.93	18.10
3	**Hyderabad**	-	-	-
4	**Medak**	22.2	19.03	19.30
5	**Nizamabad**	26.05	46.1	43.00
6	**Adilabad**	18.05	34.15	23.50
7	**Karimnagar**	32.15	37.05	32.20
8	**Warangal**	29.75	36.55	33.30
9	**khammam**	23.26	32.65	34.20
10	**Nalgonda**	24.76	28.6	41.40

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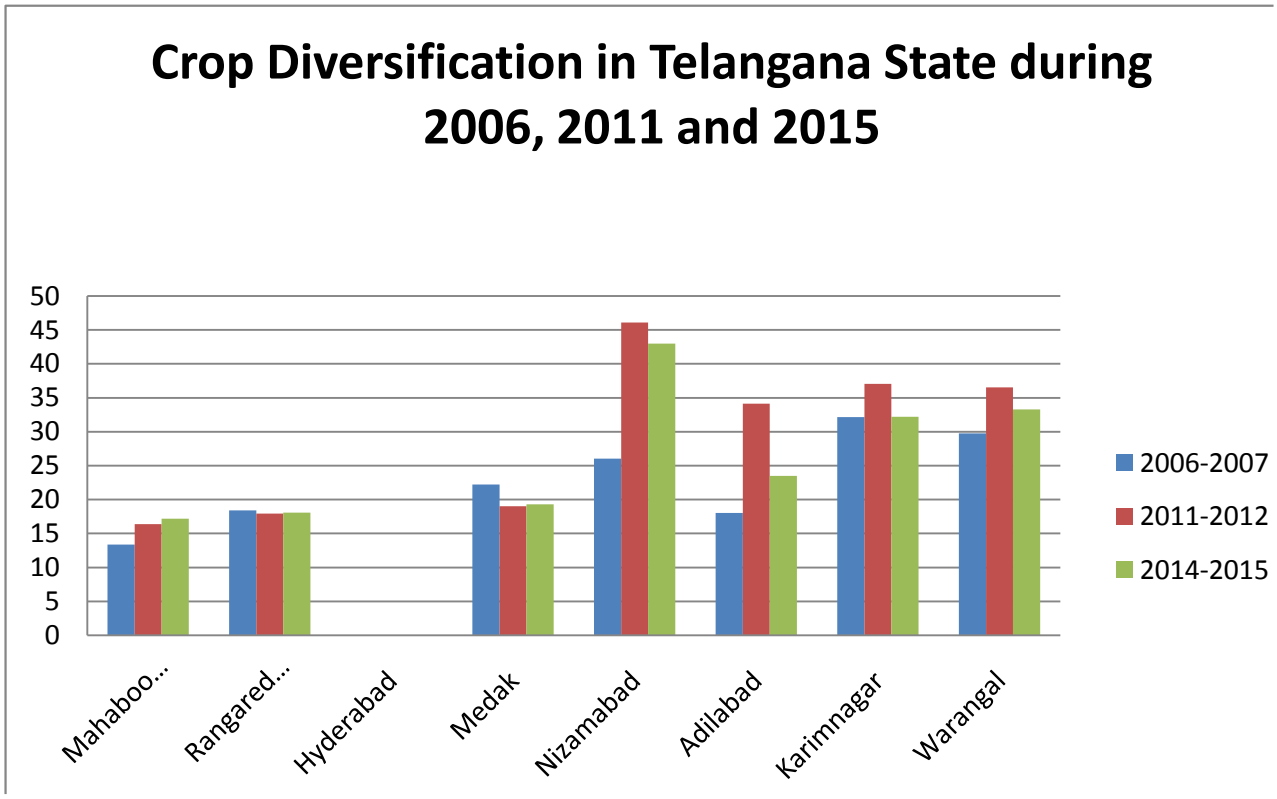

High crop diversification occupies a major share of agricultural area, characterized by low and erratic rainfall and distinct soil problem with a low level of agricultural intensification. The districts with less than 20 degree of diversification include Mahabubnagar, Rangareddy and Medak. In this region rainfall is low, compare to other districts. The main crops grown are cotton, pulses grountnuts, Jowar and rice. Lack of Irrigation facilities, Fragmentation of land holding less favouring modernization and mechanization of agriculture are the main factors for high diversification of crops. This indicates that the entire area is with positive remarks for socio-economic and environmental aspects. Poor basic infrastructure like rural roads, Power, Transport, Communications also other factors for diversification. Ranga reddy and Medak districts are very near to Hyderabad, capital of Telangana where people are requires variety of food stuff due to these reason different crops are grown.

Medium-diversification zone (20-40 percent): large number of districts includes in this zone. Earlier six districts are identified in this zone, slowly it has come down to three districts namely Karimnagar, Warangal and Khammam districts in 2014-15. The important crop cultivated here are rice, cotton and pulses. These crops are cultivated intensively with assured irrigational facilities.

Low-diversification zone(more than 40 percent): this zone covers Nizamabad and Nalgonda only in Telangana. Earlier no districts is included in this zone because of assured irrigational facilities by Sriramsagar canal and Nizamsagar canal. Because of drought in 2014-15 these districts are also shifted over to moderate and low diversifications. Minor irrigation projects like Alisagar, Guptha, Singeetham, Pocharam, lift irrigation facilities and availability of borewells in surrounding areas in Nizamabad district also boosted to include into it. Fertile soils, use of fertilizer and mechanisition with high level of crop intensification are other factors for carrying and continuing in low diversification of crops. Rice is the predominant crop in Nizamabad district followed by Oilseeds. Cotton is predominant crop grown in Nalgonda district. Nagarjunasagar, Solipeta, Dindi are the main irrigation projects besides occurrence of black soil and favorable climatic conditions are other factors. Sub-optimal and over-use of resources like land and water, causing a negative impact on the environment and sustainability of agriculture

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Table 2. Crop Diversification in Telangana State

Level of Diversification	Range	Number of Districts in 2006-07	Number of Districts in 2011-12	Number of Districts in 2014-15
High	Less than 20	Mahbubnagar, Rangareddy, 3Adilabad	Mahbubnagar, Rangareddy, Medak	Mahbubnagar, Rangareddy, Medak and Adilabad
Moderate	20 to 40	Khammam, Warangal and Karimnagar Nizamabad and Nalgonda and medak	Adilabad Khammam, Warangal , Nalgondaand Karimnagar	Khammam, Warangal and Karimnagar
Low	more than 40	-	Nizamabad	Nizamabad and Nalgonda

IX. CONCLUSION

Moderate crop diversification zone is dominant compared to high and low diversification zone in the state. It is concluded from the study that mainly two districts have shifted from moderate diversification to low diversification from 2006 to 2015. The important crops grown in the state are paddy, pulses and Cotton. Crop diversification changes mainly due to availability of irrigational facilities particularly lift irrigation facilities, fertile soil, adoption of of fertilizers and mechanization of agriculture etc. In future, Crop pattern changes in low diversified areas would lead to serious environmental consequences like groundwater depletion, soil fertility, water logging and salinity which can reduce the crop productivity and growth potential of agriculture. To ensure the sustainability, high diversification has to be encouraged.

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