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## DIVERSIFICATION OF CROPPING PATTERN IN INDIA



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### ABSTRACT

India, being such a vast country, presents wide variations in agro climatic conditions. Such variations have led to the evolution of regional niches for various crops. In agricultural development, 'Diversification', is one of the most commonly used term in the recent years. By tradition, diversification was used more in the context of a subsistence kind of farming and the farmers grew many crops on their farm. The household level food security as also risk was an important consideration in diversification. Crop diversification refers to a shift from traditionally grown less remunerative crops. Diversification of agriculture is a shift from the regional dominance of one crop to regional production of a number of crops, to meet ever increasing demand for cereals, pulses,

vegetables, fruits, fodder, fuel, etc. It aims to improve soil health and a dynamic equilibrium of the agro-ecosystem. The cropping pattern of an area has important implications for its agricultural growth in general and livelihood of millions of Indian farmers. Apart from agro-ecological conditions and different socio-economic, infrastructure and institutional factors, the cropping pattern decision of the farmers is largely influenced by their exposure to risks arising out of various sources. The paper tries to study the crop production and economics scenario. It attempts to recognize Indian perspective of crop diversification and also examine pattern of crop diversification in India.



**KEY WORDS:** India, diversification, agriculture, cropping pattern, crop production, economics scenario

### INTRODUCTION

India is a country of about one billion people. More than 70 percent of India's population lives in rural areas where the main occupation is agriculture. Indian agriculture is characterized by small

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farm holdings. The average farm size is only 1.57 hectares. Around 93 per cent of farmers have land holdings smaller than 4 ha and they cultivate nearly 55 percent of the arable land.

*Agriculture diversification refers to the development of greater variety of agricultural crops within space and time.* Diversification includes changes in cropping pattern, shift of work force from agriculture to its allied activities, such as livestock, poultry, fisheries, horticulture etc. Non-agriculture sector includes agro-processing industries, leather industries, jiggery making, cottage industries etc.

Crop diversification is intended to give a wider choice in the production of a variety of crops in a given area so as to expand production related activities on various crops and also to lesson risk. Crop diversification in India is generally viewed as a shift from traditionally grown less remunerative crops to more remunerative crops. The crop shift (diversification) also takes place due to governmental policies and thrust on some crops over a given time, for example creation of the 'Technology Mission on Oilseeds' (TMO) to give thrust on oilseeds production as a national need for the country's requirement for less dependency on imports. Market infrastructure development and certain other price related supports also induce crop shift. Often low volume high-value crops like spices also aid in crop diversification.

Crop diversification and also the growing of large number of crops are practiced in rain fed lands to reduce the risk factor of crop failures due to drought or less rains. Crop substitution and shift are also taking place in the areas with distinct soil problems

### Conceptual Framework

The term 'diversification' has been derived from the word 'diverge' which means to move or extend in the direction different from a common point (Jha, Kumar and Mohanty, 2000).

The term "crop diversification" is used in different contexts. While defining diversification in a purely economic term - it is treated from two analytical perspectives; first, as a process of establishing, at given prices, the optimal crop mix on a production possibility frontier; and second as a mechanism for incorporating risk aversion into a farmer's decision making process in which crop specialization may lead to highly unstable income due to variance in yield, production, or price for the particular crop (World Bank, 1988). In either case, diversification is highlighted due to two purposes increases the income and decrease the risk- both aspects of the quality and quantity of diversification. The argument is that farmers must be in a position to produce high value crops and secondly with increase in commercialization must also be able to maintain the diversity in the cropping pattern in order to deal with the risk in this sector.

In the development context, crop diversification has become a very important option to attain several objectives of agriculture sector. Broadly, the rationale for crop diversification emanates from the opportunities it offers to reduce production and price risks, increasing yields, natural resource sustainability, ecological balance, increasing flexibility, and sustain productivity and growth. Not only this, it creates opportunities for more employment and higher incomes through more efficient use of resources and exploitation of comparative advantage (World Bank, 1990).

Crop diversification is a process, which on the one hand help the growers to improve their per capita income and diffuse risk and on the other hand provides more diversified food items to consumers. It minimizes the risk associated with production of single crop and helps the farmers to liberate from poverty trap. It contributes to sustainable agricultural development by preventing the degradation of land, water and environment. It also provides employments and prevents excessive migration and helps in earning foreign exchange (Mruthyunjaya and Chauhan, 2003).

In the recent past, change in cropping pattern from conventional/ traditional to high-value



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cash crops has also been experienced in the Indian agriculture (Singha & Chakravorty, 2013).

### Approaches to Crop Diversification in Indian Agriculture:

#### 1. Horizontal Diversification :

The primary approach to crop diversification used in production agriculture. In this approaches, diversification normally takes place through crop intensification which means adding new high value crops to existing cropping systems as a way of improving the overall productivity of a particular farm or a regions' farming economy as a whole.

#### 2. Vertical Diversification:

Vertical diversification approach in which value is added to the products by farmers through various methods such as processing regional branding, packing, or other efforts to enhance the product.

A diversified agricultural economy opens up many opportunities. Soil fertility can be increased by way of crop rotation. It adds value in the agriculture by increasing the total crop productivity and at the same time stabilizes the farm income by minimizing the risk associated with only one crop. Since majority of the farmers in India have small landholdings and their income from crop cultivation as well as non farm income is not enough to meet their subsistence level and also, the country that produces only a few specialized crops is more prone to risk due to fluctuations in domestic and international prices, hence, both the horizontal and vertical diversification become the need of the hour.

#### Objectives of the Study:

- ❖ To study the Crop Production and Economics Scenario in India
- ❖ To examine Pattern of Crop Diversification in India
- ❖ To examine the extent and nature of changes in cropping pattern in India.
- ❖ To examine the growth that is sustainable technologically, environmentally and economically.

#### Methodology of the Study:

Data used for the study was collected from various secondary published sources, i.e. from the Directorate of Economics and Statistics (DES), Bangalore, Karnataka, Journals, Books and etc.

#### Cropping Pattern Changes:

In India as a whole as well in all the eastern states the area share of cereals in the Gross Cropped Area (GCA) has been highest amongst other crops from 1970-71 to 2007- 08. In India, the area share under cereals in the GCA has declined from 70.30% in 1970- 71 to 61.89% in 2007-08. Area under pulses has reduced marginally. Area under oilseeds has increased from 9.41% to 13.20%. Area under fruits and vegetables has increased from 0.35% to 1.59%. The area shares of crops like cotton, jute, coconut, sugarcane, and spices showed a marginal increase during this period.

There has been a significant change in the cropping pattern in the past few decades. In India as a whole as well in all the eastern states the area share of cereals in the GCA has been highest amongst other crops from 1970-71 to 2007- 08. It was also observed that the area devoted to food grains (cereals and pulses) was much higher in all the eastern states compared to horticultural crops.

The cropping pattern in each state was compared between 1999-2000 and 2006-07 by using the index of crop diversification formulated by Bhatia (1965). It was seen that crop diversification had

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reduced from their 1999-2000 levels in the state of Bihar, Orissa and Jharkhand, while it increased slightly in Uttar Pradesh and a lot in West Bengal.

### Diversification of Cropping Patterns in India

The Cropping Patterns in India underwent several changes 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 agriculture in terms of crops, primarily on economic considerations. The crop pattern changes, however, are the outcome of the interactive effect of many factors which can be broadly categorized into the following five groups:

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 factors covering farm size and tenancy arrangements, research, extension, and marketing systems and government regulatory policies.

### The crop output growth in India has been classified into four different zones:

- The Northern region has diversified towards rice and wheat
- Eastern zone remained more or less specialized on rice
- Western and Southern zone have diversified mostly towards many non-food grains like oilseeds, and few food grains including pulses

### Diversification of Cropping Patterns in Karnataka:

With the growth of technology, modernization, and changes in consumption pattern, Karnataka agriculture has undergone a major shift in the recent past, moving away from the cereal to non-cereal crops cultivation, especially toward the horticulture crops. Horticulture has been one of the fastest growing sectors within the larger agricultural activities in the State. Overall change in the area under horticulture cultivation in the State between TE 2004-2005 and TE 2009-2010 was found to be at the highest, estimated at 15% compared with 5.6% of cereal crops during the same period. However, growth trends of area under pulses and oilseeds were found to be negative, estimated at -1% and -10%, respectively. At present, the State produces about 17.80 million MT of horticulture crops from an area of 1.87 million ha, accounting for 7.40% of horticultural production of the country. Although the sector accounts for 15% of total net area sown in the State, its contribution to gross value of output in the sector was around 40%. Also, Karnataka is the largest producer of spices, and aromatic and medicinal crops in the country.

Within the horticulture sector, vegetable crops have contributed the largest share of area and production in the State in the recent past. Albeit the production of plantation and fiber crops occupy a larger share of area to GCA, their contribution to State's total production was not very impressive. Although the State's share of fruit area to GCA was not very significant, its contribution to total production in the State was at the highest within the horticulture crops. Among the districts, Kolar, Tumkur, Hassan, Chikmagalur, and Haveri have contributed a larger share of area and production of horticulture crops in Karnataka. Also, the contributions (growth trend) of the districts of Uttara

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Kannada, Mandya, Dakshina Kannada, and Dharwad, in terms of area and production, have been very statistically significant. Of the individual horticulture crops, vegetable was mainly contributed by the districts of Hassan, Belgaum, Kolar, and Kodagu. In the case of fruit, the districts of Kolar, Tumkur, and Mandya have contributed the lion's share of State total output and export.

In the case of diversification toward the horticulture crops, the districts of Gulbarga, Raichur, Bijapur, Bidar, Koppal, Bagalkot, and Bellary have shown complete diversification. However, the districts of Kolar, Udupi, and Dakshina Kannada were found to have diversified the least. The study further explored that the districts that had experienced complete diversification toward the horticulture sector devoted a lesser share of cultivable area under horticulture. Also, most of these districts (highly/completely diversified) have come under the dry zones and experienced a high growth rate of area. On the contrary, the districts with a lesser diversified and lesser growth of area under the crop have devoted a larger share of area to GCA. It is believed that the districts which have devoted a higher share of area under horticulture with lesser diversification might be cultivating more perennial or long-gestation period crops.

### Economics Scenario:

The productivity levels of many major crops in India do not compare very favourably with the yield obtained in agriculturally advanced countries. Further, these factor coupled with high illiteracy constrain the farmer's ability to shift to more remunerative cropping patterns in response to market signals. Therefore, their capacity to take advantage of the opportunities presented by liberalization of trade is limited. The country's agriculture has gained in strength and resilience since independence, although growth in agriculture has gained in strength and resilience since independence, although growth in agriculture is highly skewed over regions and crops. However, the agriculture sector in India is now faced with intense and external pressures arising from the impact of policies of economic liberalization. Efficient and effective management of agriculture will be crucial in the years to come for acquiring enduring self-reliance and ensuring sustainable growth with an emphasis on consideration of equity.

### Advantages:

1. Better use of land, labour, and capital.
2. The farmer and labour engaged all the year round in different activities.
3. Less risk to crop failure and market price of the product.
4. Soil fertility and erosion can be checked as land kept under cultivated throughout the year. Diversified farming is less risk than specialized farming.

### Disadvantages:

1. Do not fetch desirable profit so long as cooperative marketing facility not there.
2. Proper inspection of different enterprises is difficult.
3. It is not possible to farmer to maintain all type of machinery required for different crops.
4. The wastage of farm in any farm is difficult to detect

### The Present Cropping Patterns:

As indicated earlier, we can hardly describe all the cropping patterns within the framework of this paper. Therefore only important ones are highlighted. There are many ways in which a cropping pattern can be discussed. A broad picture of the major cropping patterns in India can be presented by

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taking the major crops into consideration. To begin with, the south-westerly monsoon crops (kharif), bajra, maize, ragi, groundnut, and cotton. Among the post-monsoon crops (rabi), wheat, sorghum (rabi) and gram can also be considered to be the base crops for describing the cropping patterns. With such an approach, the crop occupying the highest percentage of the sown area of the region is taken as the base crop and all other possible alternative crops which are sown in the region either as substitutes of the base crop in the same season or as the crops which fit in the rotation in the subsequent season, are considered in the pattern. Also these crops have been identified as associating themselves with a particular type of agro-climate, and certain other minor crops with similar requirements are grouped in one category. For example, wheat, barley and oats, are taken as one category. Similarly the minor millets (*Paspalum*, *Setaria* and *Panicum* spp.) are grouped with sorghum or bajra. Certain other crops, such as the plantation crops and other industrial crops are discussed separately. Among the kharif crops, rice, jowar, bajra, maize, groundnut, and cotton are the prominent crops to be considered the base crops for describing the kharif cropping patterns.

#### CONCLUSION:

The present study discusses the pattern of agricultural diversification considering different definitions of agricultural diversifications. Though the share of agriculture in the overall economy has been decreasing the share of livestock and fisheries in agriculture has increased. Land which under the full impact of green revolution and has high diffusion of fertilizers and irrigation with modern, though generally carried out by large farmer only. A threat to the availability of fine cereals is however a long drawn one since the crop diversification trends from state like Haryana are not necessarily supportive to the aggregate level. The micro level evidence suggest that the certain crops are more remunerative in the given resource endowment and institutional framework.

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