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Preety
Research Scholar,
Department of Economics
CRS University, Jind,
Haryana, India

Dr. Rakesh Sihmar
Assistant Professor,
Department of Economics
CRS University, Jind,
Haryana, India

Crop diversification in Haryana

Preety and Dr. Rakesh Sihmar

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Abstract

Because most rural residents depend on agriculture directly or indirectly for their living, agriculture is essential for the growth of an economy. Following the green revolution in 1966-1967, crop specialization in India was increased, with a focus on rice and wheat in particular while horticulture has been practiced. Analysis of the trend, pattern, and extent of agricultural diversification is attempted in the study Haryana. The researcher took into account factors including the size of the landholding, the type of crops grown there, and diversification in the study toward the very profitable crops. The analysis is based on secondary information gathered from numerous public sources. According to the report, Haryana farmers have diversified their agricultural practices to include fruits and vegetables.

Keywords: Agriculture, landholding, crop, diversification

Introduction

The term "diversification" has its roots in the word "diverse," which implies to travel or stretch away from a common point, according to Jha. The transition from agricultural to non-agricultural activities, such as dairy, poultry, animal husbandry, etc., is known as agriculture diversification. India's population is mostly dependent on the agricultural sector, yet this sector's contribution to the GDP is declining. Compared to other sectors, this one is still under a lot of employment pressure.

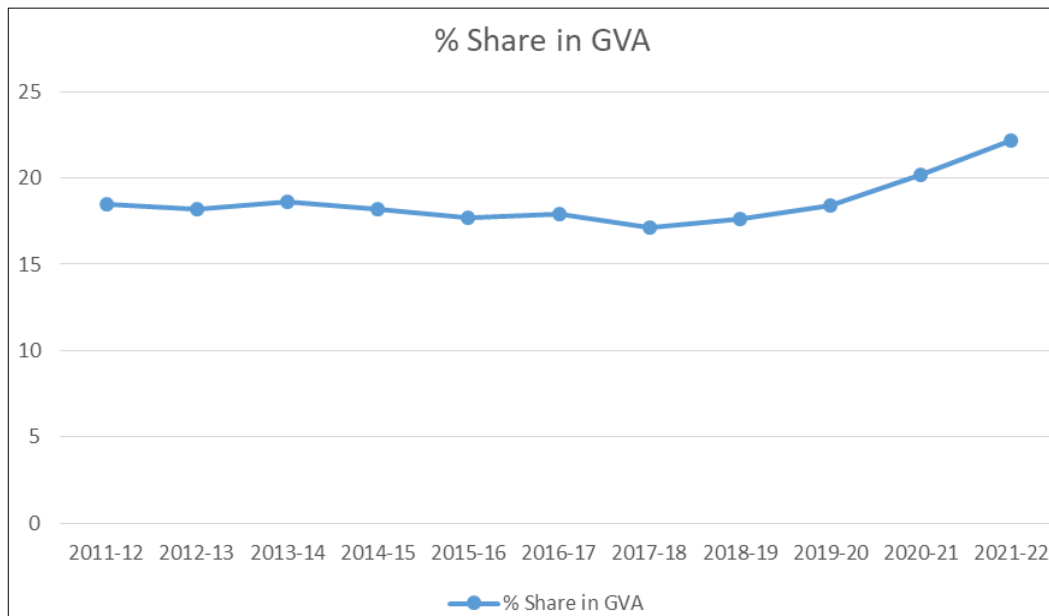
Table 1: Percent share of Gross Value Added (GVA) at Current Prices

Year	% Share in GVA
2011-12	18.5
2012-13	18.2
2013-14	18.6
2014-15	18.2
2015-16	17.7
2016-17	17.9
2017-18	17.1
2018-19	17.6
2019-20	18.4
2020-21	20.2
2021-22	22.2

Source: NSO, Ministry of Statistics and Programmed Implementation

Table 1 and figure 1.1 clearly shows that, almost stagnant growth in agriculture sector from 2011 to 2019 and it is lies from 17 percent to 18 percent. In 2020-21 there is significant increase in the GVA of the agriculture sector.

Corresponding Author:
Preety
Research Scholar,
Department of Economics
CRS University, Jind,
Haryana, India



Source: NSO, Ministry of Statistics and Programme Implementation

Fig 1: Clearly shows that, almost stagnant growth in agriculture sector from 2011 to 2019

Importance of crop diversification

Crop diversification is the introduction of new crops into agricultural production or a change in cropping patterns. 70 to 80 percent of farmers currently have land that is smaller than 2 hectares. These farmers need to diversify their crops with very lucrative ones like maize, legumes, etc. Under the "merapani-merivirasat" program, the Haryana government has also encouraged diversification by offering a per-acre incentive of Rs. 7000 for switching to a different crop. By lowering the risk related to the pricing of diverse farm goods, crop diversity fosters economic stability. Additionally, it lessens the likelihood of natural disasters including drought, pest disease, and unpredictable rainfall. A crop mixed cropping arrangement would be helpful in this situation. By switching from more water-dependent crops to less water-intensive ones like wheat and legume rice, it also aids in resource conservation.

Objectives of the study

1. To analyze the trend in the production of various crops in Haryana.
2. To check the magnitude of crop diversification in Haryana.

Literature Review

Anuja *et al.* (2021) ^[44] used District level data from several years to investigate the pattern of crop diversification in India. It was based on data from various years' worth of land use statistics. The Simpson index of diversification was employed in the study to gauge agricultural diversification levels. According to the study, there are significant geographical differences in the nutritional results of crop diversity. Additionally, the study discovered a link between diversity and under nutrition in the various study districts. Francaviglia (2021) ^[45], agriculture diversification increased food output and food security. The study made use of original data gathered in Italy. According to the study, management methods are crucial for promoting the intensive agriculture system.

Barman *et al.* (2022) ^[46] examined crop diversification as a way to achieve sustainable agriculture goals. It improves the biological cycles to minimize the input cost, maximize returns and decrease risk due to environmental and ecological elements. The study revealed that the intensification of crops increased the net returns and productivity of a farm. Crop diversification improves nutritional security, ensures food security, generation of employment, and moves toward sustainable agriculture.

Vernooy (2022) ^[47] identified crop diversification as a tool to mitigate climate change impacts on agriculture. It promotes the resilience of the household or community. The findings of the study revealed that there are positive outcomes because it increases yields, income, nutrition, and food security. The study noted that apart from all these impacts, crop diversification also improves the environment quality and moves toward a more sustainable future.

Rawat and Bala (2021) ^[48] determined the pattern of crop diversification in Haryana. The study found that rice and wheat were the major staple food crops of the state. The study also revealed that the area under rice was highest in the Karnal and Kaithal districts. Based on yield Gurugram is at the top. But the state has faced many difficulties due to excessive cultivation of rice such as water shortage and declining soil quality.

Ansari (2018) ^[49] examined the growth of horticulture crops in India over the years. The study found that in the 1980s there has no diversification but during the early 1990s it moves towards horticulture crops accompanied by the introduction of LPG policies in India. And now the economy started diversifying towards nonfood crops such as fruits and vegetables. Factors responsible for crop diversification identified by the study were the rate of return and productivity of the crops which was higher in the case of horticulture.

Mallick and Pattabayak (2017) ^[51] explored the relationship between crop diversification and sustainable agriculture. Herfindahl index was to be used in the study and secondary data was collected from 2007-08 to 2013-14 of various

crops. And the study found that area under coarse cereals has been declined from 2.10 to 1.76 percent and the area under fruits and vegetables has been increased continuously. According to the study, the crop diversification highest in Andhra Pradesh and followed by West Bengal, Bihar, Maharashtra, and Karnataka.

Lava and Kuri (2016) [50] presented empirical indication from West Bengal to identify the relationship between crop diversification and food security. The study found that regions having a low level of crop diversification had an acute deficit of per capita availability of food production. It showed that regions with high per capita production observed high level of crop diversification.

Methodology

Secondary data from a variety of government sources, including the Ministry of Agriculture, statistics Abstract, the Horticulture Department of Haryana, the Agriculture Census of India, etc., were used in the study for analysis. A diversity index and a variety of analytical tools were used to analyze the data. The study uses the Simpson index to determine the degree of crop diversification. Herfindahl index is the source of Simpson index (D). One less than the

Herfindahl index is the Simpson index.

$$D = 1 - \sum_{i=1}^N (p_i)^2$$

Here, p represents a crop's proportional share of the gross cropped area, and D stands for the Simpson index.

The value of the index lies between zero and one. One means there is perfect diversification and zero means no diversification or crop specialization.

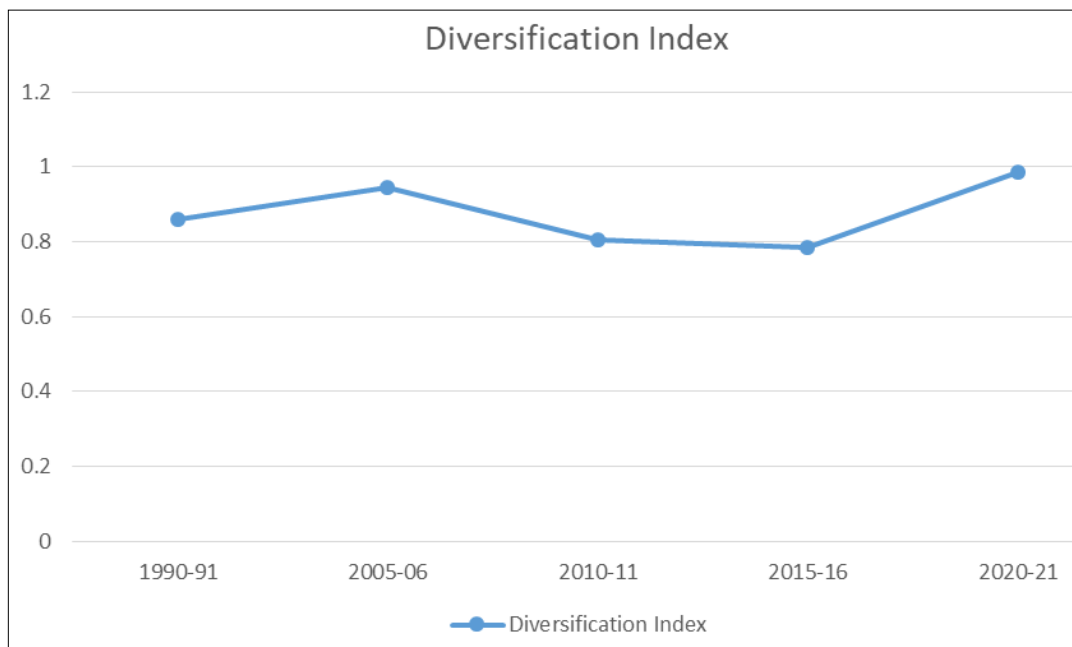
Result and Analysis

On the basis of secondary data on crop diversification the results are estimated through diversification index.

Table 2: Diversification Index

Years	Diversification Index
1990-91	0.858872457
2005-06	0.94339558
2010-11	0.804908824
2015-16	0.786086544
2020-21	0.9875901154

Source: Authors own calculation by using secondary data



Source: Authors own calculation by using secondary data

Fig 2: Show Diversification index trend line

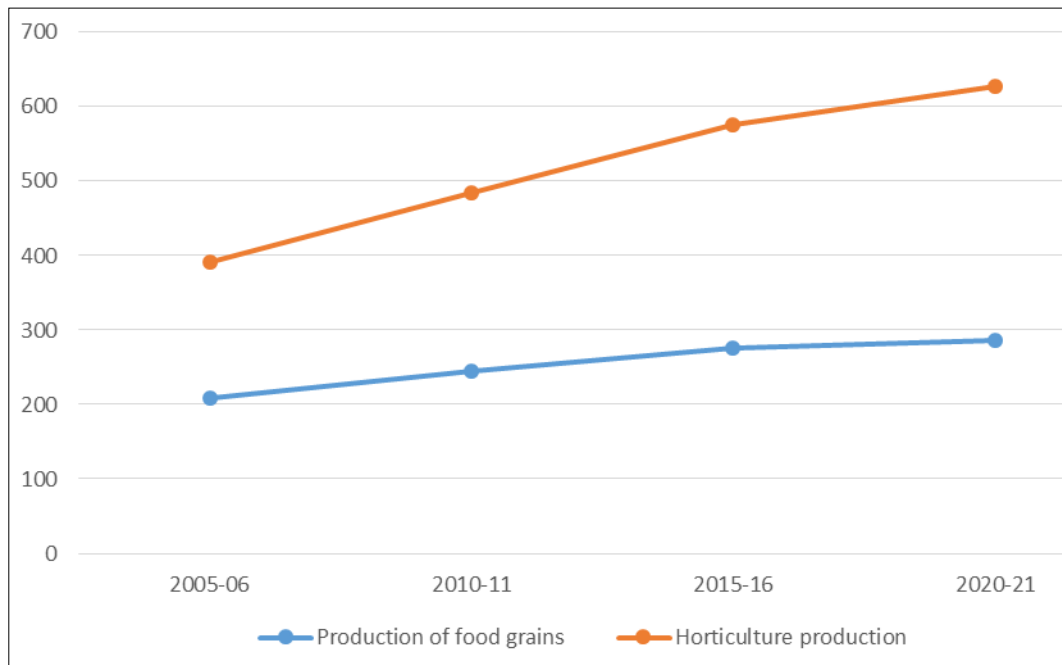
Diversification index trend line shows that, there is significant crop diversification exhibits by the state. The value of index clearly described that, diversification in the state increasing step by step like jerks.

Table and diagram described the picture of production of food grains and horticulture crops in India. Trend line shows the increasing tendency of horticulture production means that continuous increase in the diversified production in the state.

Table 3: Food Grains and Horticulture production in India

Year	Production of food grains	Horticulture production
2005-06	208.60	182.82
2010-11	244.50	240.53
2015-16	275.68	299.85
2020-21	285.98	340.88

Source: Department of Agriculture, Cooperation & Farmer's Welfare



Source: Department of Agriculture, Cooperation & Farmer's Welfare

Fig 3: Show diagram described the picture of production of food grains and horticulture crops

Conclusion

The primary cause for concern in Indian agriculture is the advancement of the sector and the variety of crops. As one of the leading States in terms of agricultural output, Haryana is important to India's agricultural industry. Economic reforms have caused a lot of changes in the agriculture sector in Haryana. The study looked at how the State's crop diversification has grown and discovered that horticultural crops in particular have shown an increase in advancement. Kurukshetra and Hisar, among the many districts of the State, experienced the greatest development in terms of land devoted to horticultural crops, while Charkhi Dadri, Jhajjar, and Palwal experienced little to no diversification. The Simpson Index value demonstrates that crop diversification has been happening and accelerating in the State from 2017 to 2022. The Haryana government should do more to encourage diversity in order to preserve natural resources for sustainable agriculture.

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