



Original Article

A study of agriculture diversification in Kerala state, India

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ABSTRACT

Diversification of cropping pattern in Kerala was examined for a period of 10 years from 2000-2009, dividing the entire period into two sub periods as 2000-2004 and 2005-2009. Diversification indices like Herfindhal index and Simpson index were calculated for different districts of the state, for the two periods separately. Almost all districts except Palakkad showed a reduction in diversification from period I to period II, whereas Palakkad showed a negative shift. He studies revealed that Thiruvananthapuram moved more towards the specialization of crops followed by Malappuram and Kasargod as comparing both the periods, whereas Kollam, Wayanad and Palakkad exhibited minor shift in crop diversification.

Keywords: Diversification, Herfindhal index, Simpson index

Introduction

Diversification in Agriculture is defined as alteration of a substantial acreage from the prevailing crop structure to some substitute crops or cropping systems or farm enterprises. It is a plan of shifting from less profitable to more profitable crops. Farmers' level potential productivity and monetary benefits act as guiding principles while opting for a particular crop or cropping system. Multiplicity of cropping systems has been one of main features of Indian agriculture and it is attributed to rain fed agriculture and prevailing socio economic situations of farming community.

Agriculture occupies an important place in the economic life of Kerala, as it provides the key to economic growth and fluctuations there in; overall economic growth of the state is greatly influenced by growth achieved in agricultural sector. Kerala is very rich in production of cash crops like coconut, arecanut, cashewnut, rubber, pepper etc. The main food crop of the state is rice. In Kerala only 57 percent of the total geographical area is under cultivation with 74 percent of total population living in rural areas of the total working population, 7 percent are cultivators and 15.8 percent are agricultural labourers, and agriculture and allied sector contribute nearly 15 percent to GSDP. There are marked regional differences in the pace of agricultural development in Kerala because of natural resource endowments, farming practices, adoption of technology, availability of irrigation facilities, attitude of

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farmers etc., in different districts of the state. Hence there is marked diversity in crops in different districts of the state. Most of the past studies relating to the performance of agriculture in Kerala have been made assessment at the aggregate level. Since, major part of the land under cultivation is rainfed, not much comprehensive study so far has been conducted on the structure and dynamics of agricultural production and productivity in different zones of the State. A study at the regional level would quite be useful to formulate agricultural policies for the all regions. It also envisages in understanding the changes in cropping pattern over the years in terms of spatial and temporal diversification in cropping pattern in different districts of Kerala state.

Materials and Methods

The study region comprised of all the 14 districts in the Kerala state. Secondary time series data for a period of 10 years from 2000- 2009, collected from Dept. of Economic and Statistics, Kerala, was used for the analysis. The Study period is divided into two periods as 2000-2004 and 2005-2009. To analyze the extent of shift in cropping pattern area of sixteen different agriculture crops like rice, coconut, arecanut, rubber, banana, cashew, ginger, turmeric, tapioca, pineapple, pepper etc. were considered. Statistical indices of Diversification like Herfindhal Index and Simpson Index were calculated for the fourteen districts separately over two periods. Herfindhal Index (HI) is the sum of square of the proportion of individual activities in a portfolio. This is a measure of concentration, alternately an inverse measure of diversification, the mathematical formulae for calculating the index is as follows,

$$H.I = \sum P_i^2$$

Where

$$P_i = \frac{A_i}{\sum A_i}$$

A_i is the area of i^{th} crop, and $\sum A_i$ is the total area.

Simpson Index of diversification(SI) was used and it considered as the most suitable index for measuring dispersion of enterprises in a particular geographical region (Joshi etal, 2004). The mathematical formulae for calculating the index is as follows,

$$S.I = 1 - \sum P_i^2$$

Where

$$P_i = \frac{A_i}{\sum A_i}$$

A_i is the area of i^{th} crop, and $\sum A_i$ is the total area.

Results and Discussion

To analyze the shift in cropping pattern across the different districts, the above mentioned indices have been used; Statistical indices were calculated for all the fourteen separately for two periods viz., 2000—2004 and 2005—2009. Table.1. Show Herfindhal indices for different districts for the two periods separately. Herfindal Index was high for Kozhikode district (0.2634) and was lowest for Idukki district (0.1919) in the period 2000-2004. Ernakulam and kollam district also shows lower indices with index value less than 0.20, whereas Palakkad and kottayam shows higher indices of more than 0.22. If the calculated value nearer to zero then it indicates that these zones have more diversification in cropping pattern. This indicates that Idukki district is having maximum crop diversification, followed by Ernakulam and Kollam districts. Minimum crop shift is occurred in the distret of Kozhikode followed by Kottayam and Wayanadu. It shows that less diversification in cropping pattern is observed in the districts of Kozhikode, Kottayam and Wayanadu. The pattern may be due to the concentration of these districts in plantation crops, especially in

rubber, pepper, arecanut etc. The area may prefer mono cropping rather than diversified agricultural crops. The index is increased in value for almost all districts from the first period (2000-2004) to second period (2005-2009), except for the Palakkad district. For Palakkad district shows a negative growth from period I to period II.

Table 2. shows the Simpson index for different districts in the state. It can be seen that the districts Idukki, Erankulam and Kollam are with high indices whereas, Kozhikkode, Wayanadu and Kottayam are with low indices in the period I from 2000-2004. The indices of other districts fall in between these two groups. It can also be seen that, Idukki district shows the highest index in the second period also, followed by Kollam, Erankulam and Kannur. Similarly, Kozhikkode, Kottayam, Wayanadu and Pathanamthitta show low indices in the second period also. The indices are increased in all districts, except in the case of Palakkad district, where the index remains almost the same. The major difference occurs in the case of Thiruvananthapuram district followed by Malappuram and Kasargod. In Simpson index, if the calculated value nearer to one then it indicates that these zones have more cropping shift. This result also shows the same pattern as like Herfindhal index. The districts Idukki, Erankulam and Kollam show considerable crop diversification in both periods of study. Minimum crop shift is observed in the districts of Kozhikkode, Kottayam and Wayanadu.

In general, considering both the indices, the indices are increased in all districts, except in the case of Palakkad district, where the index showed a negative trend (fig 1). The major difference occurs in the case of Thiruvananthapuram district followed by Malappuram and Kasargod. This is an indication that, Palakkad districts concentrate on diversified crops during the entire period of 2000-2009. But the increase in the index in Thiruvananthapuram, Malappuram and Kasargode indicates that, these districts shift to crop specialisation pattern in period II. The commercialization of agriculture is induced by introducing the commercial crops instead of traditional crops, so that there is a shift in cropping pattern. Hence the substitution of agricultural crops by other crops, sometimes horticulture crops may also be introduced. But in this region there is a considerable rate of increase in rural literacy, so that we can see a considerable shift (Kozhikkode, Kottayam, Kasargod and Malappuram districts and districts in hill station). Moreover the conversion of paddy land to plot may reduce the paddy area in the state. It is evident from the statistics of paddy area in the state that, the area reduced drastically from 1970 to 2010. This converted area is replaced by plantation crops like rubber arecanut etc. or even keep the land as fallow land or non-agricultural land. This reduces considerable area in paddy crop and may create imbalances in cropping pattern.

Table 1. Herfindhal Index

Districts	Herfindhal Index	
	Period I	Period II
Thiruvananthapuram	0.2188	0.2335
Kollam	0.198	0.2047
Pathanamthitta	0.2242	0.2361
Alappuzha	0.2156	0.2227
Kottayam	0.2506	0.2628
Idukki	0.1919	0.2014
Ernakulam	0.1964	0.2048
Thrissur	0.2194	0.2294
Palakkad	0.2299	0.2239
Malappuram	0.2172	0.2299
Kozhikkode	0.2634	0.2748
Wayanad	0.2377	0.2413
Kannur	0.2059	0.2134
Kasaragod	0.2133	0.2257

Table 2 . Simpson Index for Different Districts

Districts	Simpson Index	
	Period I	Period II
Thiruvananthapuram	0.7812	0.7665
Kollam	0.802	0.7953
Pathanamthitta	0.7758	0.7639
Alappuzha	0.7844	0.7773
Kottayam	0.7494	0.7372
Idukki	0.8081	0.7986
Eranakulam	0.8036	0.7952
Thrissur	0.7806	0.7706
Palakkad	0.7701	0.7761
Malappuram	0.7828	0.7701
Kozhikode	0.7366	0.7252
Wayanad	0.7623	0.7587
Kannur	0.7941	0.7866
Kasaragod	0.7867	0.7743

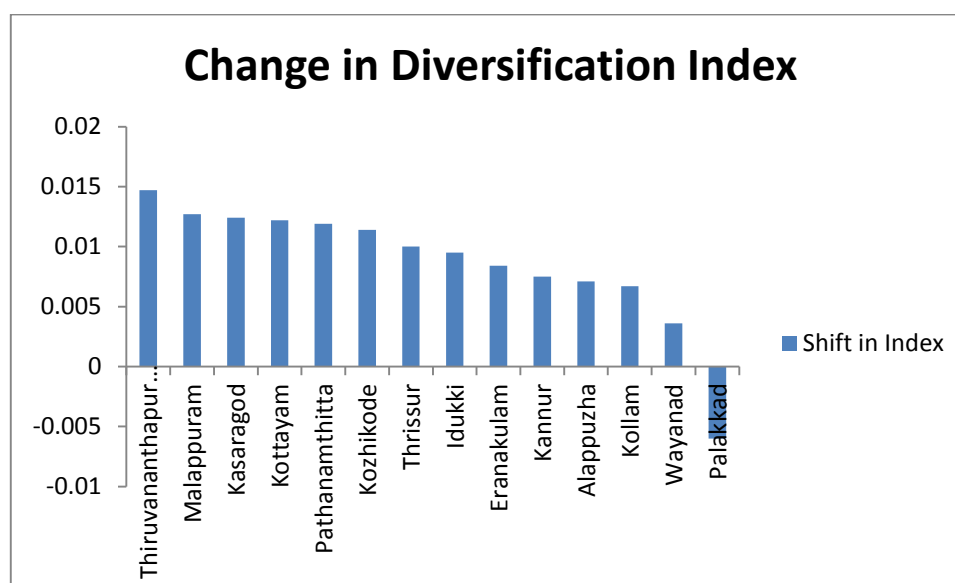


Fig. 1: Comparison of Crop Diversification in Period I and Period II

Conclusion

The crop diversification in the state is declined from period I to period II, as the state typically focusses on the high remunerative crops like rubber, plantation crops, spices etc. The decrease in area of the rice field is major threat to the climate change. If the same state continues, the total cropping pattern in the state may changes in to the specialized cropping system and there by the changes in the climatic parameters. Hence Govt. should take the necessary steps, to retain and restore paddy lands in the state. Also, as the mono cropping or crop specialization reduces the genetic base of the crops, necessary steps has to be followed to increase the diversity by incorporating different crops in the same filed, by adopting cropping practices like mixed cropping practices , inter cropping etc. in the plantation crops.

Use of rice fallows for the cultivation of vegetables also improves the situation of the crop diversification in the state.

References

- Ayyoob, K.C., Krishnadas, M. and Khaleel F.M.H. (2013). Intra Regional Disparity in Agricultural Development of Kerala, *Agr. Update* 8 (1& 2): 103-106
- Behera, U.K., Sharma, A.R. and Mahapatra, C. (2007). Crop Diversification for Efficient Resource Management in India: Problems, Prospects and Policy, *Journal of Sustainable Agriculture*, 30(3):234—244.
- Joshi, P.K., Ashok G, Pratap S B, and Laxmi T. (2004). Agriculture Diversification in South Asia Patterns, Determinants, and Policy Implications, *Economic and Political Weekly*. 8(1): 2457—2467.
- Singh, N.P., Ranjit Kumar and Singh R.P., (2006). Diversification of Indian Agriculture: Composition, Determinants and Trade Implications, *Agricultural Economics Research Review*, 19: 23—36. www.ecostat.kerala.gov.in