Original Research Article

Comparative study on Crop Diversification in Tribal and Non-tribalarea of Chhattisgarh

Abstract

This paper aims to measure crop diversification for a uniform data set of 21 year in tribal and non-tribal area which includeseight districts of Chhsttisgarh state of India namely Bastar, Kondagaon, Balrampur and Surguja (In tribal region) and Raipur, Rajnandgaon, Durg and Dhamtari (in Non-tribal region). At the same time it focuses on status and changing pattern of crop diversification in the districts with a comparative outlook of both. Data used for the study were collected from year 2001 to 2022 and whole study was divided in to seven periods and separate analysis was done for all period. Simpson index were used to measure the crop diversification in the districts for comparative study. Results of the study shows complete diversification was found in the tribal area in all period through all index and likewise in Surguja and Balrampur district crop specialization was found more than Durg and Raipur districts of non-tribal area. During the study I was found that higher indices observed in the tribal area than non-tribal area.

Key words: diversification, diversification indices, simpson index

1.Introduction

Crop diversification is a strategy to maximize the use of land, water and other resources and for the overall agricultural development in the country. It provides the farmers with viable options to grow different crops on their land. The diversification in agriculture is also practised with a view to avoid risk and uncertainty due to climatic and biological vagaries. It minimizes the adverse effects of the current system of crop specialization and monoculture for better resource use, nutrient recycling, reduction of risks and uncertainty and better soil conditions. It also provides better economic viability with value-added products and improvement of ecology. The specific objectives of this paper were: to comparative analyze of the nature and extent of crop diversification in tribal and non-tribal area of Chhattisgarh.

2.Material and Methods

The simpson Diversification Index has been constructed for state, district and farm household level, for districts, divisions and state, Diversity Index is constructed for twenty years i.e. from 2001-02 to 2021-22. For farm household level, memory recall method was used to find out the change in area, crops, crop groups and their varieties in the selected districts i.e. Raipur, Durg, Dhamtari and Rajnandgaon (Non-tribal area) and Bastar, Kondagaon, Balrampur and Surguja districts (Tribal area). To examine the nature of crop diversification within different crop groups and within all crops taken together, the Simpson Diversity Index has been worked out for different crop such as overall crips, annual and Seasonal crops, foodgrains crops, cereal crops, pulses crops, oilseed crops. Growth rates were also worked out for the diversification index over the study period (2001-02 to 2021-

Comment [L1]: Is this secondary data? Please state clearly the source of the data used for this research.

Comment [L2]: - Kindly include citations for all of the references in this section.
- The research problems and objectives of this research were not stated.
- It is difficult to understand the importance of this research without knowing the state of the art at the beginning.

Comment [L3]: Kindly explain the reason for using this index.

Comment [L4]: Where does this data come from? Is this primary data or secondary data? Please state detailed and clearly in the method.

22).The index ranges between 0 and 1. If there exists complete specialization, then index moves towards 0. The index is easy to compute and interpret, as follows:

$$D = 1 - \frac{\sum n(n-1)}{N(N-1)}$$

Where:

n = number of individuals of each crops

N = Total number of Crops

3. Result and Discussion

For analyses of Simpson Index (SI), the whole study period (2001-02 to 2021-22) has been classified into 7 sub-periods, considering a periodicity of 3 years, namely, Period 1: 2001-03; Period 2: 2004-06; Period 3: 2007-09; Period 4: 2010-12; Period 5: 2013-15; Period 6: 2016-18 and Period 7: 2019-22. So in this section an attempt is made to analyze the nature and extent of crop diversification at districts and state level. At districts and state level index for different crop groups viz. overallcrops(kharif and rabi crops), paddy, pigeonpea, maize, green gram, sesamum, minor millets,soybean, black gram, mustard and rapeseed, linseed, wheat, chickpea and lathyrus are measured and quantified using Simpson Diversification Index at secondary data from 2001-02 to 2021-22.

In order to present area allocation among various crops cropping pattern changes has also been analysed for the two periods i.e.2001-02 and 2021-22.

The results of Simpson Diversification index for every crop group at districts and state level are presented in two categories: (1) first give the changes in diversification index over the period of 11 years and in second one (2) a summary of diversification index, growth rate of diversification index along with coefficient of variation.

3.1 Crop diversification index of kharif crops in tribal area and non-tribal area

SI indices were obtained annually and periodically for the eight crops including paddy, pigeonpea, maize, green gram,sesamum, minor millets,soybean and black gram,. To compare the crop diversification indices in tribal and non-tribal area table 1 and fig 1 has been studied. The table depicts that tribal area is more diversified than the non-tribal area.

Table 1: Crop diversification in overall area during Kharif season

Area	Districts	Simpson diversification index
Tribal area	Bastar	0.858

Comment [L5]: Kindly include the references cited for this equation.

Comment [L6]: Could you please explain the reasons for the periodicity and sub-period classification of time?

Comment [L7]: This word has never been stated before. Please describe these words clearly and briefly in the section before the results.

Comment [L8]: This word has never been stated before. Please describe these words clearly and briefly in the section before the results.

Comment [L9]: This word has never been stated before. Please describe these words clearly and briefly in the section before the results.

	Sarguja	0.972
	Balrampur	0.867
	Kondagaon	0.751
Non-tribal area	Raipur	0.223
	Rajnandgaon	0.407
	Durg	0.123
	Dhamtari	0.286

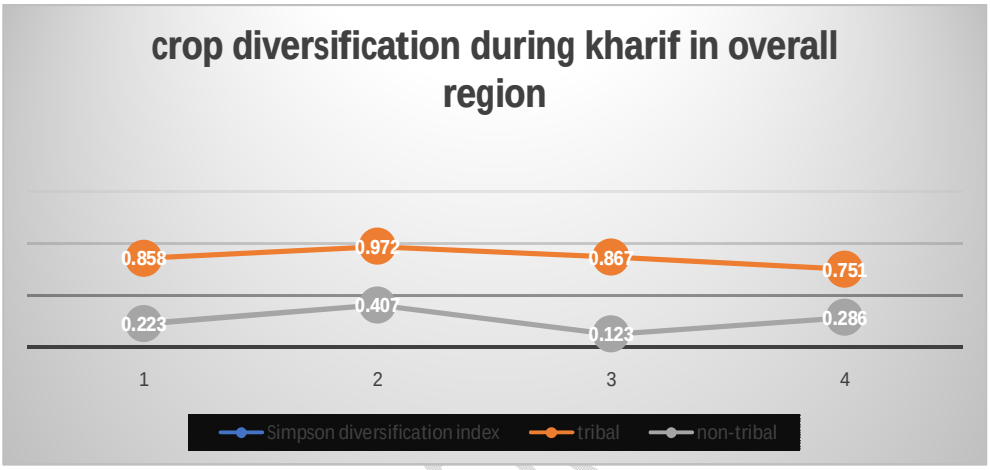

Fig.1: crop diversification in overall area during kharif season

3.2 Crop diversification index of Rabi crops in tribal area and non-tribal area

SI indices were obtained annually and periodically for the five cropsnamelymustard and rapeseed, linseed, wheat, chickpea and lathyrus.To compare the crop diversification indices in tribal and non-tribal area table 2 and fig 2 has been studied. The table depicts that tribal area is more diversified than the non-tribal area.

Table 2: Crop diversification in overall area during Rabi season

Area	Districts	Simpson diversification index
Tribal area	Bastar	0.599
	Sarguja	0.712
	Balrampur	0.664
	Kondagaon	0.679
Non-tribal area	Raipur	0.538
	Rajnandgaon	0.286
	Durg	0.522
	Dhamtari	0.599

Comment [L10]: This word has never been stated before. Please describe these words clearly and briefly in the section before the results.

Comment [L11]: This word has never been stated before. Please describe these words clearly and briefly in the section before the results.

Comment [L12]: This word has never been stated before. Please describe these words clearly and briefly in the section before the results.

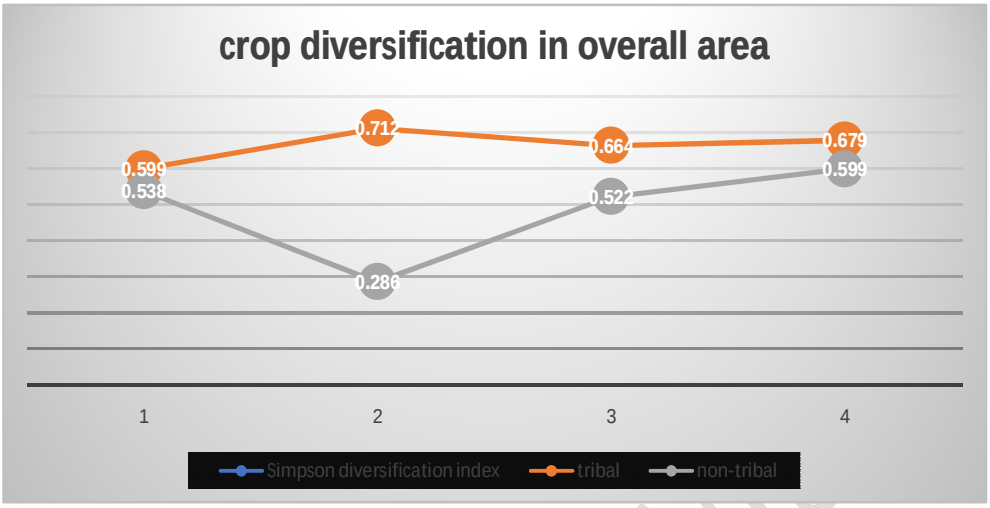

Fig.2: crop diversification in overall area during Rabi season

Comment [L13]: This word has never been stated before. Please describe these words clearly and briefly in the section before the results.

4. Conclusion

Comment [L14]: The conclusions become unclear and unacceptable because the direction and objectives of the research are also unclear.

On the basis value of Simpson index maximum proportion we can concludes that Surguja and Balrampurdistrict from tribal area shows higher diversification than Raipur and Durg district of non-tribal area from 2001 to 2022. It might be due presence of less cultivated area,no adequate facilities of irrigation, low marketing and infrastructural facilities and lack of awareness of government policy and programs in non-tribal area. That's why still they were in crop specialization mainly base on livestock's and its products. From the above results we can say that simpson index were found higher in tribal area than non-tribal area. Geographical location of both the regions was totally different and results also vary in both. On the basis of this we can also concludes that the degree of diversification is not evenly distributed over the districtsin the state. While some of the districts are picking up diversification quite rapidly others are lagging behind (supported by Bhattacharyya 2008). This might be because of the fact that even though the state or district has achieved self-sufficiency in staple food the emphasis is still focused towards increasing production of rice.

Comment [L15]: The discussion should be written in the discussion section.

Formatted: Highlight

Comment [L16]: The discussion should be written in the discussion section.

References

Comment [L17]: Only one reference was cited. The other references were not included in the text.

[1]Acharya, S., Basavaraja, S.P., Kunnal, H., Mahajanashetti, L.B. and Bhat, A.R.S. (2011) Crop Diversification in Karnataka: an Economic Analysis. Agricultural Economics Research Review. **24** (2): 351-358.

[2] Bhattacharyya, R. (2008)Crop Diversification: A Search for an Alternative Income of the Farmers in the State of West Bengal in India, International Conference on Applied Economics – ICOAE 2008 83

[3]Bhalsing R.R. (2009). Impact of Irrigation on Crop Diversification In: Ahmed Nagar District (Maharashtra)Shodh, SamikshaaurMulyankan. International Research Journal II (7).

Formatted: Highlight

[4] De, U.K. and Chattopadhyay, M.(2010). Crop diversification by poor peasants and role of infrastructure:Evidence from West Bengal. Journal of Development and Agricultural Economics, **2**(10): 340-350.

[5]Joshi, P.K., Birthal, P.S. and Minot, N. (2006). Sources of Agricultural Growth in India: Role of Diversification towards High Value Crops. MTID Discussion Paper No. 98. IFPRI Markets Trade and Institutions Division

[6] Pal, S. and Kar, S. (2012) Implications of the methods of agricultural diversification in reference with maldadistrict: drawback and rationale, International Journal of Food, Agriculture and Veterinary Sciences, **2** (2): 97-10.

[7] Rathod, S., Surendra, H.S. Munirajappa, R., and Gowda, D.M. (2012) Extent of agriculture diversification inKarnataka. Mysore Journal of Agricultural Sciences. **45** (4):788-794.

8] Seng, K., (2014) Determinants of Farmers' Agricultural Diversification: The Case of Cambodia Asian Journal of Agriculture and Rural Development, **4**(8):414 -428