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Changing Patterns Of Crop Diversification In Chamarajanagar District, Karnataka

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Abstract: Crop diversification refers to a shift from the regional dominance of one crop to the regional production of several crops. In Chamarajanagar district, the degree of diversification exhibits large disparities among different regions. In this context, this study is aimed at computing the growth rate in area, production, and productivity of selected crop groups in study area and analyzing crop diversification at the taluka level by computing the crop diversification index for all the taluks. The data used for the estimation of the taluk-wise food crop diversification index were collected from the land-use statistics, M.S. Building Bangalore. We estimated the crop diversification index using the triennium average of food crops area ending for the year 2020-21. The Gibbs and Martin Index of Diversification values as well as growth rate indicated that there is high crop diversification in the north east and central regions of Chamarajanagar district whereas, Southeast and west regions showed low diversification due to the system of Mono cropping and crop specialization prevailing in the same region.

Keywords: - Crop Diversification, Gibbs and Martin Index of Diversification, Growth Rate, Chamarajanagar District.

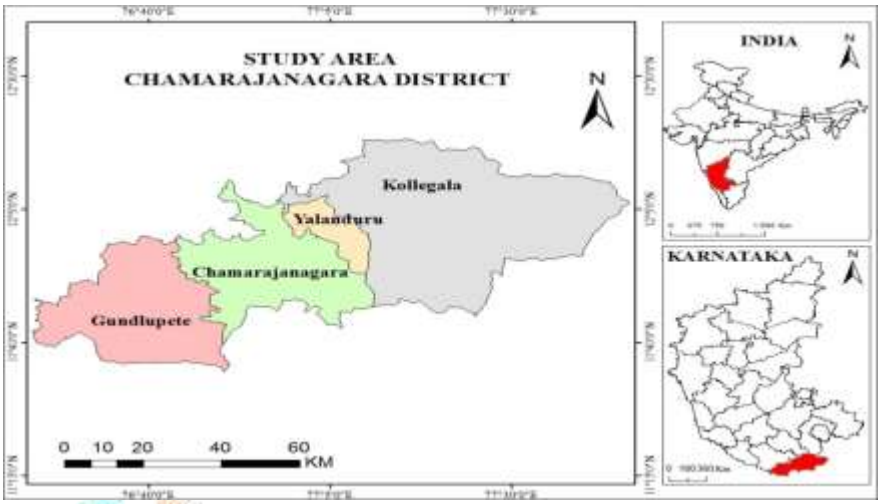
INTRODUCTION

Crop diversification means to raise variety of crops on arable land. It reflects the impact of physio-socio-economic variables. Moreover, it shows the contemporary competition among crops for an area, scope for rotation, the effect on double cropping, (Husain, 1979). The greater numbers of crops lead to greater competition, the higher is the magnitude of diversification. Crop diversification is the opposite of crop specialization. The level of crop diversification largely depends on the geo-climatic, socio-economic conditions and technological development in a particular region. In general, higher the level of agricultural technology lesser is the degree of diversification. In the study region the poor and subsistent farmers were more and this resulted in the diversification of the crops.

STUDY AREA

The study area forms a distinct land unit, besides being a cultural unity lying between 76°.24’ and 77°.43’ east longitudes and 11°.32’ and 12°.16’ north latitudes. It is bordered by Mysore and Mandya district of Karnataka state in the North, Nilgiris and Coimbatore districts of Tamilnadu state in the South-East, Waynad district of Kerala state in South-West. It has Geographical area of 5671.71 Sq. Kms. Chamarajanagar district lies in the

southernmost part of Karnataka state. The general elevation of the district ranges between 700 to 900 meters above sea level. The district is almost surrounded by eastern and western Ghats where some places are having an elevation of more than 1200 meters above sea level.



Crop Diversification Technique adopted in the study

The quantitative techniques proposed by **Gibbs** and **Martin** for measuring crops diversification provides a useful alternative index for measuring the degree of diversification in the cropping pattern of an area.

The formula developed for calculating the index was as under.

$$\text{Index for Diversification} = 1 - \frac{\Sigma X^2}{(\Sigma X)^2}$$

Where, '**X**' is the percentage of total cropped area under an individual crop.

Change in Crop Diversification

Increased Diversification:-The increased diversification is found in Chamarajanagar, Gundlupete and Yalanduru taluks have increased their diversity within a span of 20 years i.e., 2000-01 and 2020-21. The highest diversification index value is noticed is 0.08 in Yalanduru taluk of the study region.

Decreased Diversification:-Kollegala taluk have recorded a decreased diversification of crops. The decreased diversification index value is noticed 0.06.

Taluk Level Crop Diversification

Low Crop Diversification:-Yalanduru taluk has low crop diversification in first decade, while Chamarajanagar taluk was high in first decade, gradually became low in second decade. Gundlupete taluk was medium in first decade, gradually became low crop diversification in second decade. The low diversification of crops is due to development of tube wells and canal irrigation, sufficient rainfall, high yields and relatively higher prices of crops.

Taluk Wise Crop Diversification for 2001-02 in Chamarajanagar District

GIBBS AND MARTIN'S QUANTITATIVE METHOD

SI. NO	Taluk	Paddy	Ragi	Jowar	Maize	Sugar Cane	Pulses	Oil Seeds	Fruits	Vegetables	Cotton	ΣX^2 / $(\Sigma X)^2$
1	Chamarajanagara	5.65	19.56	18.42	0.24	23.11	20.73	6.15	2.61	2.66	0.89	0.82
		31.90	382.43	339.21	0.06	533.87	429.64	37.77	6.84	7.08	0.79	
2	Gundlupete	0.13	6.45	22.13	0.39	5.81	34.13	12.26	0.63	2.93	15.16	0.79
		0.02	41.57	489.55	0.15	33.78	1164.77	150.25	0.39	8.56	229.76	
3	Kollegala	17.06	21.69	0.15	25.30	2.94	15.34	15.79	0.23	0.25	1.26	0.81
		291.01	470.36	0.02	639.97	8.62	235.18	249.41	0.05	0.06	1.58	
4	Yalanduru	49.94	8.44	2.34	0.21	15.34	18.71	4.17	0.14	0.73	0.00	0.68
		2493.69	71.21	5.49	0.04	235.17	349.96	17.35	0.02	0.53	0.00	

Taluk Wise Crop Diversification for 2020-21 in Chamarajanagar District

GIBBS AND MARTIN'S QUANTITATIVE METHOD

SI. NO	Taluk	Paddy	Ragi	Jowar	Maize	Sugar Cane	Pulses	Oil Seeds	Fruits	Vegetables	Cotton	ΣX^2 / $(\Sigma X)^2$
1	Chamarajanagara	3.18	5.36	12.08	15.46	4.58	32.06	10.89	6.84	6.44	3.10	0.83
		10.13	28.71	146.01	239.03	20.94	1027.96	118.59	46.84	41.52	9.61	
2	Gundlupete	0.00	3.47	13.36	8.54	0.71	18.68	26.92	2.89	9.78	15.65	0.83
		0.00	12.02	178.41	73.01	0.51	349.05	724.75	8.34	95.61	244.86	
3	Kollegala	13.60	18.66	0.19	42.80	2.41	9.94	2.24	2.92	2.89	4.35	0.75
		184.84	348.21	0.04	1831.62	5.82	98.89	5.02	8.54	8.34	18.91	
4	Yalanduru	35.00	4.27	0.93	13.55	15.23	26.18	1.22	2.84	0.79	0.00	0.76
		1225.13	18.20	0.87	183.50	231.81	685.20	1.50	8.08	0.62	0.00	

Taluk Wise Crop Diversification Indices and Their Change From 2000-01 & 2020-21 in Chamarajanagar District.

GIBBS AND MARTIN'S QUANTITATIVE METHOD

SI. NO	Taluk	I-D 2001-02	I-D 2020-21	Change (+) or (-)	Increase (or) Decrease
1	**Chamarajanagara**	0.82	0.83	+0.01	Increase
2	**Gundlupete**	0.79	0.83	+0.04	Increase
3	**Kollegala**	0.81	0.75	-0.06	Decrease
4	**Yalanduru**	0.68	0.76	+0.08	Increase
Mean		**0.78**	**0.79**		
Standard Deviation		**0.06**	**0.04**		

Taluk Wise Crop Diversification Categories For 2001-02 & 2020-21 in Chamarajanagar District

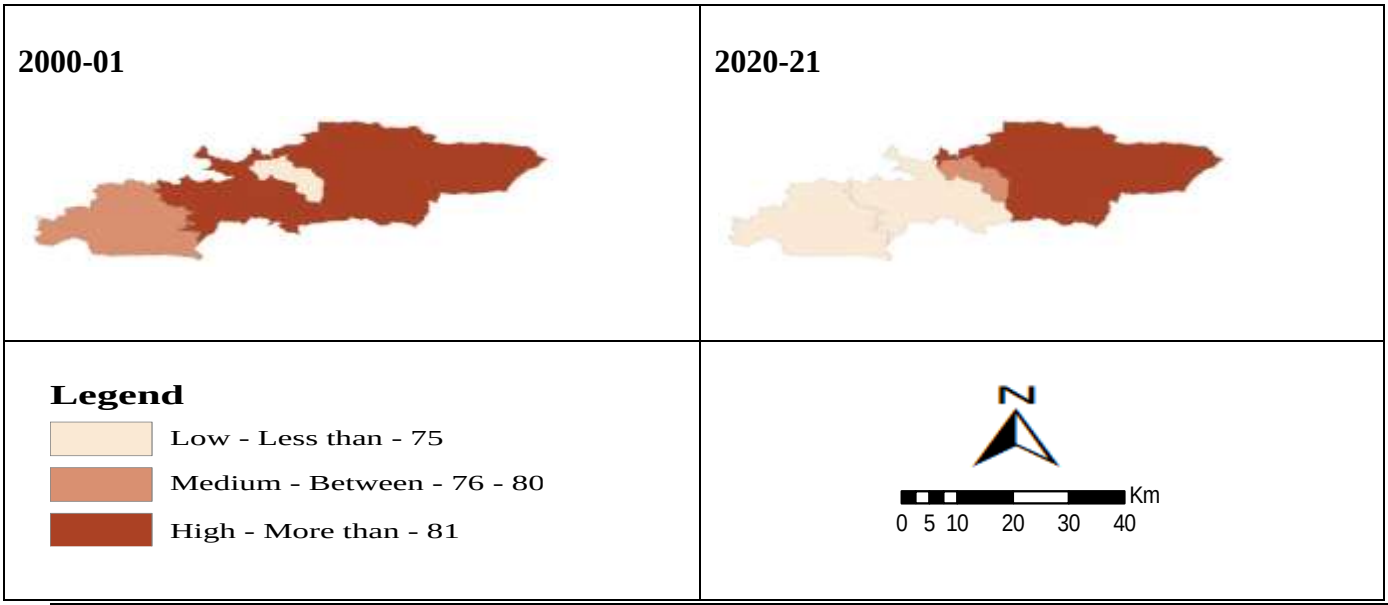
CROP DIVERSIFICATION (2000-01 & 2020-21)

GIBBS AND MARTIN'S QUANTITATIVE METHOD

Diversification Categories	Range of Intensity	2001-02		2015-16	
		Number of Taluks	Name of the Taluks	Number of Taluks	Name of the Taluks
Low	Less than - 75	1	YAL	2	CHA, GUN
Medium	Between - 76 - 80	1	GUN	1	YAL
High	More than - 81	2	CHA, KOL	1	KOL

CHA = Chamarajanagar, GUN = Gundlupete, KOL = Kollegala, YAL = Yalanduru

CROP DIVERSIFICATION
By Gibb's and Martin Method



Medium Crop Diversification:-Gundlupete taluk was medium in first decade and during second decade Yalanduru taluk was medium crop diversification. Yalanduru taluk was low in first decade later in second decade it came up to medium crop diversification.

High Crop Diversification:- Areas of high diversification were observed in Chamarajanagar and Kollegala taluks during 2001-02 and 2020-21 only Kollegala taluk were high crop diversification.

CONCLUSIONS

India, being a vast country of continental dimensions, presents wide variations in agro climatic conditions. Such variations have led to the evolution of regional niches for various crops. Historically, regions were often associated with the crops in which they specialize for various agronomic, climatic, hydro-geological, and even, historical reasons. But, in the aftermath of technological changes encompassing bio-chemical and irrigation technologies, the agronomic niches are undergoing significant changes. With the advent of irrigation and new farm technologies, the yield level of most crops-especially that of cereals-has witnessed an upward shift making it possible to obtain a given level of output with reduced area or more output with a given level of area and creating thereby the condition for inter-crop area shift (diversification) without much disturbance in output level. Besides, as agriculture become drought proof and growth become more regionally balanced, there has been a reduction in the instability of agricultural output.

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