DEVELOPMENT OF DRY LAND AGRICULTURE TO OVERCOME CRISIS: PROBLEMS AND PROSPECTS

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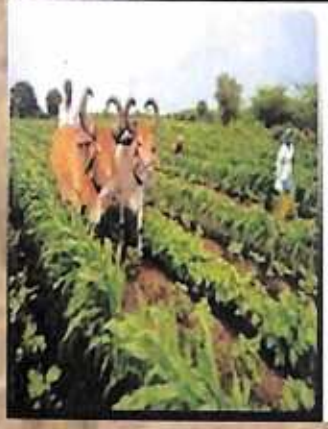

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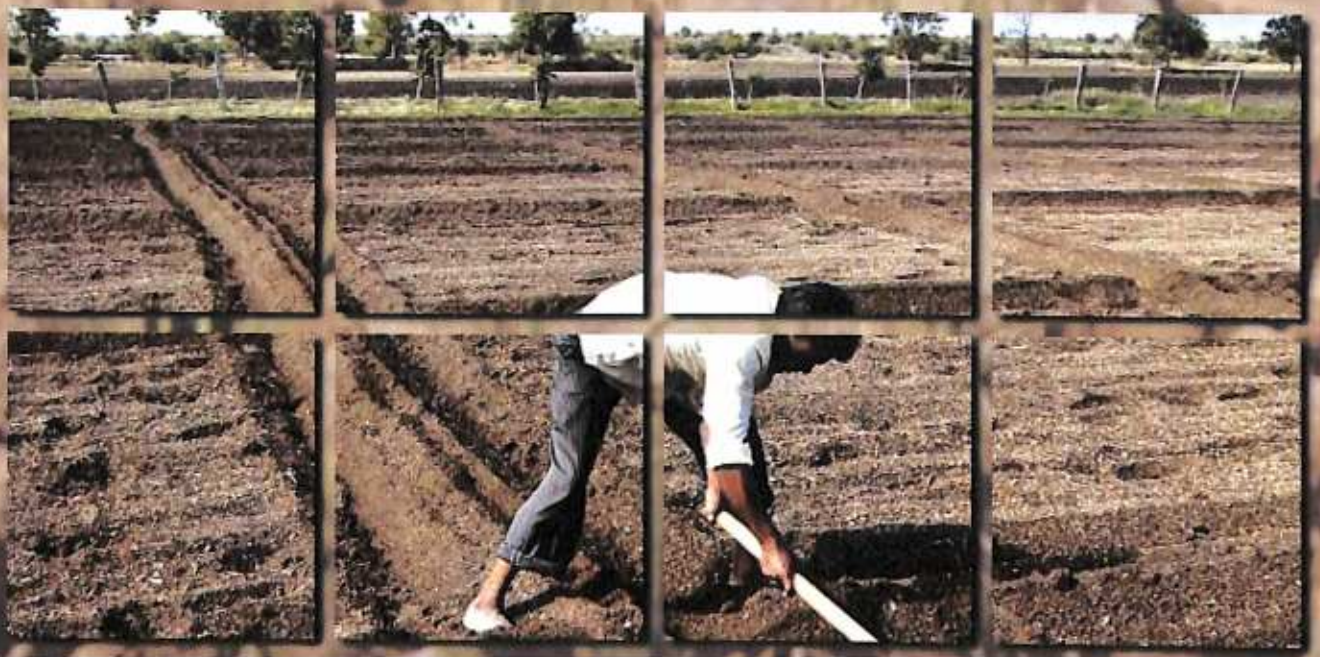

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Crop Diversification in Ghataprabha River Basin a Spatio-temporal Analysis

Dr. Abhay M. Patil * & Shri. P.B.Joshi**

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 farm holdings. The average farm size is only 1.57 hectares. Around 93 percent of farmers have land holdings smaller than 4 ha and they cultivate nearly 55 percent of the arable land. On the other hand, only 1.6 of the farmers has operational land holdings above 10 ha and they utilize 17.4 percent of the total cultivated land. Due to diverse agro-climatic conditions in the country, a large number of agricultural items are produced. Broadly, these can be classified into two groups - foodgrains crops and commercial crops. Due to the challenge of feeding our vast population and the experience of food shortages in the pre-independence era, 'self reliance' in foodgrains has been the cornerstone of our policies in the last 50 years. Around 66 percent of the total cultivated area is under food grain crops (cereals and pulses). Concurrently, commercial agriculture developed for whatever reasons in the pre-independent phase also kept flourishing during the post independent period. Commercial agriculture not only catered to the domestic market but has also been one of the major earners of foreign exchange for the country.

Crop diversification has great relevance in agricultural land use planning. Crop diversification is a concept, which is opposite to crop specialization. It refers to growing of varieties of crops either in a region or in the same field, the keener the competition the higher the magnitude of diversification. In fact it refers to farming system in which multiplicity of crops characteristics is the agricultural landscape of a real unit. In the diversified farming, there is hardly any scope for specialization, and there is poor magnitude of commercialization.

Crop diversification in India is generally viewed as a shift from traditionally grown less remunerative crops to more remunerative crops. 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. Diversification has became necessary for developing countries like India since growing demand for food crops such as cereals alone cannot support economic development, notwithstanding the need to ensure food security to the people. In essence, diversification to commercial crops becomes an essential strategy that can increases incomes in agriculture, minimize risk due to crop failure and may earn foreign exchange.

Crop diversification is now almost a normal feature of stable agriculture and progressive farm management in most of the extensive agricultural areas of the world. In fact this has been made possible by modern irrigation and the use of fertilizers, high yielding varieties, pesticides, mechanization and technologies. Besides, there are other factors, which force the cultivators to take up the practice of crop diversification.

The present study is an attempt to know what extent the crop diversification has been taken place in Ghataprabha river basin during the study period i.e. 2001-02 to 2011-12. The study further tries to trace

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and analyse the various factors like physioco-Econo-Socio, that are responsible for the variation of crop diversification in this natural region.

Objectives:

The present study has mainly examined the Spatio-temporal variation of crop diversification in different talukas of Ghataprabha River Basin during the period lying between 2001-02 to 2011-12, which shows the changes in the total cropped area of the region. Moreover, it envisages the different levels of diversification at taluka-level (i.e., High, moderate, low, etc.) in the basin. Mainly the spatial pattern of crop diversification would be the tools for future planning in case of crop production.

Methodology :

The study is based on secondary data collected from the office of 'Directorate of Economics and Statistics'. To get final investigation of crop diversification, Gibbs-Martin Index of Diversification (1962) has been followed and this method has an advantage over other indices in that it is relatively easy to process since the index value may be calculated without reducing the actual statistics to percentages. According to this method if the total area is devoted to single crop the index value is zero i.e. indicating specialization and when the index value is 9.9 it shows that the area is evenly distributed among the crops i.e., the maximum diversification.

The formula read as follows:

$$\underset{(CDI)}{\text{Crop Diversification Index}} = 1 - \frac{X^2}{(X)^2} \times 100$$

Where, X is the percentages of the total cropped area (Table No. 1) occupied by each crop or hectare under individual crop. If the total cultivated area in a region is devoted wholly to one crop (i.e., specialization) the index value will be zero (0) and if it is evenly distributed among all crops (i.e., maximum diversification) the index value approaches one (1).

Study Area:

The Ghataprabha River Basin is a natural region and it is a part of Krishna Basin, situated in the western part of the peninsular India. The basin extended between 150 45' and 16 0 31' north latitude and 740 0' and 76 00' east longitude, covering an area of about 8829 sq.km, which is roughly 3.4 per cent of Krishna basin and 0.27 per cent of the total geographical area of the country. (Fig.No.1). Ghataprabha River Basin extends in the states of Karnataka and Maharastra, however barring a small area (i.e. about 22%) in Maharastra state, rest of the basin area (i.e. about 78%) lies in Karnataka state.

The basin area comprises of 4 districts of the two states, of which two districts namely Belagavi and Bagalkot of Karnataka state and two districts namely Kolhapur and Sindhudurg of Maharastra state. The basin covers 53.96 per cent of Belagavi district which includes Hukkeri, Gokak, Raibagh, Belgaum, Ramdurg, Soundatti, Bailhongal talukas and 24.12 per cent of Bagalkot district which includes Mudhol, Bilgi, Bagalkot, Jamkhandi talukas and it covers 21.13 per cent of Kolhapur district which includes Ajra,

Gadinglaj, and Chandgad talukas of Kolhapur district and Sawanthwadi taluka of Sindhudurg district. (Fig.No.1)

The climate of the region is partly determined by the fact that it is a part of a large landmass, which has given rise to a peculiar type of climate called monsoon. The region is characterized by both humid and semi-humid conditions. The average temperature of the region is 24.810 c, and average rainfall is about 98.6 cms. The region is predominated by black soils, mixed red and black soil, coarse shallow soil, reddish brown soil and other. The basin is drained by Ghataprabha River and its tributaries Hiranykeshi, Tamarapani, Doddahalla, Markandeya and other.

Regional Variation of Crop Diversification:

As per the Gibbs - Martin's method of crop diversification the study area has fairly high diversification of crops during the study period. In the study region, the index of crop diversification ranges from 0.69 to 0.86 in 2001-02 and 0.60 to 0.83 in 2011-12 (Table No. 2), which shows that, there is a decrease in the magnitude of crop diversification, during the study period in the region.

By employing Gibbs and Martin's method of crop diversification three groups of crop diversification have been obtained in the region for two point of time (i.e. 2001-02 and 2011-12) that is low, medium, and high diversification. These indices have been worked out for analyzing the spatial distributional pattern of crop diversification at taluka level.

High crop diversification: The Table No. 3 explains varied nature of crop diversification in the basin. In the year 2001-02 there are six talukas that fall under the category of high crop diversification viz. Bailhongal, Belgaum, Gadinglaj, Gokak, Ramdurg and Soundatti with an index value of more than 0.80, whereas four talukas viz., Bailhongal, Chikodi, Hukkeri and Soundatti, which fall under category of high diversification with an index value of more than 0.80 during 2011-12. This high crop diversification in these talukas was mainly due to scanty rainfall and lack of irrigational facilities, which often force the farmers to grow a variety of food crops like the minor millets and pulses which have shorter growing periods. The various crops grown in these talukas are eg: Rice, Wheat, Jowar, Maize, Bajra, Ragi, Save Navani, Pulses and other. (Fig. No. 2)

Medium diversification of crops: During the year 2001-02 there are seven talukas viz. Ajra, Badami, Chandgad, Chikodi, Hukkeri, Mudhol and Raibagh fall under the category of medium crop diversification, whereas in the year 2011-12 the medium crop diversification group was prevailing in nine talukas of the region viz., Ajra, Badami, Belgaum, Bilgi, Chandgad, Gadinglaj, Gokak, Raibagh and Ramdurg with an index value of 0.70 to 0.80. It is observed that the medium crop diversification is found both in irrigated and non-irrigated areas. The food crops and cash crops are the important crops in irrigated track and are influenced by canal irrigation extended by Ghataprabha and Malaprabha project and other sources of irrigation. Whereas, in the non-irrigated areas well and tank irrigation besides natural rain plays an important role in growing variety of crops in these talukas. The crops grown in these areas are mainly Rice, Jowar, Wheat, Sugarcane, Maize, Ragi, Oilseed, Pulses and others. (Fig. No.2)

Low Crop Diversification: During the year 2001-02, only two talukas fall under this category of crop diversification viz. Bagalkot and Bilgi taluka. There are only two talukas that fall under this category viz. Mudhol and Bagalkot talukas in 2011-12 with an index value of less than 0.70. This low diversification in Mudhol taluka was mainly due to the development of irrigational facilities, whereas, in

Bagalkot due to variation in amount of rainfall and rugged topography restricts to grow less number of crops. The crops grown in this talukas are Jowar and some pulses. (Fig. No. 2)

Conclusion :

The cropping pattern of Ghataprabha River Basin is high diversification in few blocks where irrigation and other favourable facilities entertains multiple cropping system. But after having obtained self sufficiency in food grains production, agriculture became increasingly commercialised. A disparity of ten years shows a significant change in crop diversification levels of classes, though not much as in index values. Thus, the overall assessment shows that the crop diversification index for the year 2001-02 in comparison to 2011-2012 exhibits a decreasing trend. The environmental constraints and natural resources are localized in few areas and technological inputs, infrastructure and facilities are very low and not equally distributed in all the areas. Thus, it can be concluded that the region should go for diversified cropping pattern to avoid adverse environmental consequences apart from reaping other benefits such as providing a boost to agricultural production, and agricultural sustainability and moreover use of modern techniques in agriculture must be increased so as to remove the disparities in agriculture.

The most feasible way of improving the diversification is to reduce the sown area of rice cultivation through altering it towards other crop production. If the diversification is appropriate then this region will be a multi-stored granary for different crops in near future.

AREA UNDER CROPS (2001-02 TO 2011-12) Table No. 1

S. No.	TALUKAS	YEARS	RICE	WHEAT	JOWAR	BAJRA	MAIZE	RAGI	NAVANE	SAVE	BARGHAT	BENGAL GRAM	HORSE GRAM	BLACK GRAM	TUR	AWARE	OTHER PULSES	GROUND NUT	SUN FLOWER	SAF FLOWER	COTTON	SUGAR CANE	TOBACCO
1	AJRA	2001-02	23.68	0.24	9.31	0.08	–	16.20	–	5.16	–	0.01	0.07	–	0.40	0.03	1.65	9.03	0.08	0.03	0.01	2.98	–
		2011-12	25.30	2.90	2.55	0.00	0.31	9.53	–	1.82	–	0.53	1.82	0.99	0.01	0.26	0.06	13.05	0.00	–	–	8.66	0.09
		2001-12	+1.64	+2.66	-6.76	-0.08	+0.31	-6.67	–	-3.34	–	-0.52	+1.75	+0.99	-0.39	-0.23	-1.59	+4.02	-0.08	-0.03	-0.01	+5.68	+0.09
2	BADAMI	2001-02	0.25	3.35	24.74	21.26	0.11	–	3.43	1.10	–	0.87	1.20	–	0.92	-	0.78	26.46	–	0.80	8.38	0.14	–
		2011-12	0.08	2.03	37.66	9.78	5.15	–	0.04	–	–	5.33	1.90	–	0.85	0.01	0.01	9.16	–	0.28	0.36	3.76	–
		2001-12	-0.17	-1.32	+12.92	-11.48	+5.04	–	-2.39	-1.10	–	+4.66	+0.70	–	-0.07	0.01	-0.67	-17.30	–	-0.58	-8.02	+3.62	–
3	BAGALKOT	2001-02	0.12	2.54	47.18	5.18	0.24	–	1.56	–	–	1.57	2.28	–	0.44	–	0.07	7.22	–	2.02	22.27	0.11	–
		2011-12	–	1.74	46.42	2.57	3.29	–	–	–	–	6.18	2.08	–	0.22	0.05	0.01	6.20	–	0.87	0.51	3.41	–
		2001-12	-0.12	-0.80	-0.76	-2.61	+3.05	–	-1.56	–	–	+4.61	-0.20	–	-0.22	+0.05	+0.03	-1.02	–	-1.15	-21.76	+3.3	–
4	BAILHONGAL	2001-02	7.70	4.40	18.65	0.80	0.10	0.20	3.70	6.13	0.66	0.70	12.30	0.77	1.06	0.07	0.26	18.77	–	0.67	8.30	3.40	0.04
		2011-12	5.00	4.35	28.30	0.18	3.30	–	0.36	1.67	0.01	8.00	0.46	0.10	1.68	0.06	0.15	6.60	0.23	1.42	16.14	4.90	0.04
		2001-12	-2.7	-0.05	+9.65	-0.62	+3.20	-0.20	-3.34	-4.46	-0.65	+7.30	-11.84	-0.67	+0.62	-0.01	-0.11	-12.17	+0.23	+0.75	+7.84	+1.50	-0.00
5	BELGAUM	2001-02	31.63	1.40	7.20	0.14	0.36	12.28	0.88	5.21	–	1.04	–	0.03	0.15	0.23	0.49	5.30	–	–	0.94	5.10	–
		2011-12	34.84	0.76	15.40	0.10	–	1.00	0.02	0.01	0.01	1.30	0.27	0.01	0.15	0.14	0.64	8.64	0.04	0.01	3.10	9.50	0.01
		2001-12	+3.21	-0.64	+8.20	-0.04	-0.36	-11.3	-0.86	-5.20	+0.01	+0.26	+0.27	-0.02	0.00	-0.09	+0.15	+3.34	+0.04	+0.01	+2.16	+4.40	+0.01
6	BILGI	2001-02	0.08	5.60	48.88	10.75	0.65	–	0.17	0.04	–	1.44	1.34	0.50	0.68	–	0.28	4.91	–	1.48	17.64	0.10	–
		2011-12	–	3.61	31.82	4.34	8.00	–	–	–	–	2.81	0.37	–	-	–	0.27	9.55	–	0.40	3.10	13.96	–
		2001-12	-0.08	-1.99	-17.06	-6.41	+7.35	–	-0.17	-0.04	–	+1.37	-0.97	-0.50	-0.68	–	-0.01	+4.64	–	-1.08	-14.58	+13.86	–
7	CHANDGAD	2001-02	24.84	0.12	0.71	–	–	21.83	–	9.55	–	0.01	0.02	–	0.02	0.01	0.91	1.77	0.02	0.02	–	6.11	–
		2011-12	26.79	0.06	0.38	0.06	1.10	14.25	–	0.47	–	0.00	0.13	0.35	0.00	0.10	-	8.53	–	–	0.01	10.00	–
		2001-12	+1.95	-0.06	-0.33	+0.06	+1.10	-7.58	–	-9.08	–	-0.01	+0.11	+0.35	-0.02	+0.09	-0.91	+6.76	-0.02	-0.02	+0.01	+3.89	–
8	CHIKODI	2001-02	2.38	0.75	27.20	3.40	1.02	0.25	1.39	0.40	0.45	0.92	–	0.90	0.54	0.06	0.48	2.55	–	0.17	0.21	4.66	17.90
		2011-12	1.20	2.46	13.35	0.63	4.78	0.01	0.05	0.03	–	2.22	0.53	0.66	0.70	0.02	0.12	14.30	0.21	0.05	0.71	22.87	18.91
		2001-12	-1.18	+1.71	-13.85	-2.77	+3.76	-0.24	-1.34	-0.37	-0.45	+1.36	+0.53	-0.24	+0.16	-0.04	-0.36	+11.75	+0.21	-0.12	+0.50	+18.15	+1.01
9	GADINGLAJ	2001-02	14.13	0.55	15.90	0.08	–	8.40	–	0.40	–	0.03	0.01	–	0.01	0.01	3.11	21.72	–	–	0.70	8.50	0.72
		2011-12	17.04	1.17	7.13	0.00	2.26	1.88	–	0.04	–	4.32	1.26	0.98	1.93	0.16	0.53	18.68	0.00	–	0.12	12.91	0.59
		2001-12	+2.91	+0.62	+8.77	-0.08	+2.26	-6.52	–	-0.36	–	-4.29	1.25	+0.98	+1.92	+0.15	-2.58	-3.04	0.00	–	-0.58	+4.41	-0.13
10	GOKAK	2001-02	0.84	5.12	31.83	14.41	11.10	0.12	1.79	0.44	0.55	1.90	–	0.03	0.23	0.35	0.92	10.03	–	1.33	5.54	2.30	1.94
		2011-12	0.27	9.36	22.81	1.43	23.40	–	0.27	0.02	0.08	2.51	0.56	0.07	0.52	0.83	0.53	2.10	–	0.30	0.54	24.32	2.35
		2001-12	-0.57	+4.24	-9.02	-12.98	+12.30	-0.12	-1.52	-0.42	-0.47	+0.61	+0.56	+0.04	-0.29	+0.42	-0.39	-7.93	–	-1.03	-4.98	+22.02	+0.41
11	HUKKERI	2001-02	2.56	0.40	1.00	3.18	1.65	1.17	1.30	2.96	1.38	0.24	–	1.10	0.21	0.62	0.01	34.42	–	0.16	0.52	3.81	7.48
		2011-12	2.67	2.40	19.47	0.36	5.00	0.10	0.28	0.37	0.08	3.03	0.50	0.17	0.33	0.22	041	17.37	0.20	0.11	3.66	12.60	6.01
		2001-12	+0.11	+2.0	+18.47	-2.82	+3.35	-1.07	-1.02	-2.59	-1.30	2.79	0.50	-0.93	+0.12	+0.20	+0.40	-17.05	+0.20	-0.05	+3.16	+8.79	-1.47
12	MUDHOL	2001-02	0.30	9.73	41.24	9.42	5.82	–	0.14	–	–	1.88	1.53	–	0.47	1.05	1.06	3.82	–	1.95	10.32	1.04	–
		2011-12	–	5.82	07.36	0.36	9.65	–	–	–	–	7.40	0.01	–	-	0.40	0.01	1.38	–	0.49	0.95	39.09	–
		2001-12	-0.30	-3.91	-33.88	-9.06	+3.83	–	-0.14	–	–	+5.52	-1.52	–	-0.47	-0.65	-1.05	-2.44	–	-1.46	-9.37	+38.05	–
13	RAIBAGH	2001-02	0.24	4.18	17.70	27.96	30.18	0.08	0.03	–	–	0.88	–	–	0.66	0.08	1.02	3.60	–	0.74	1.45	1.30	0.13
		2011-12	0.01	10.95	4.96	6.08	25.62	–	0.06	–	–	2.78	–	0.06	0.11	0.20	0.11	0.11	0.52	0.01	1.61	37.37	–
		2001-12	-0.23	+6.77	-12.74	-21.88	-4.56	-0.08	-0.03	–	–	1.90	–	0.06	-055	+0.16	-091	-3.49	+0.52	-0.73	+1.06	+36.01	-0.13
14	RAMDURG	2001-02	0.24	15.00	22.28	15.74	0.75	0.01	1.76	0.13	0.43	2.89	–	–	1.04	0.11	1.38	16.44	–	2.87	9.22	2.30	0.01
		2011-12	0.01	4.31	48.13	3.78	6.20	–	0.14	–	–	7.45	1.12	0.01	0.52	-	0.08	4.55	8.27	0.48	2.77	3.82	–
		2001-12	-0.23	-10.69	+25.85	-11.96	+5.45	-0.01	-1.62	-0.13	-0.43	4.56	1.12	0.01	-052	-0.11	-1.38	11.89	+8.27	-2.39	-6.45	+1.58	-0.01
15	SOUNDATTI	2001-02	0.05	14.92	20.73	8.73	0.14	0.01	4.55	0.14	0.56	1.83	–	0.12	0.56	0.05	0.51	14.48	–	2.41	19.50	0.33	0.92
		2011-12	0.01	14.00	27.20	1.01	11.18	–	1.83	0.02	0.12	18.02	0.87	-0.01	0.86	0.03	0.20	4.12	1.87	5.60	2.50	3.24	–
		2001-12	-0.04	-0.92	+6.47	-7.72	+11.04	-0.01	-2.72	-0.01	-0.44	16.19	0.87	0.11	+0.30	-0.02	-0.31	-10.36	+1.87	+3.39	-17.00	+2.91	-0.92
	TOTAL	2001-02	[illegible]	1.70	[illegible]	[illegible]	3.50	2.25	1.73	1.66	0.32	1.28	1.60	[illegible]	0.68	0.18	0.79	12.72	0.00	1.19	8.32	2.36	2.20
		2011-12	[illegible]	4.64	21.57	[illegible]	7.00	1.34	0.27	0.31	0.02	5.45	0.75	0.28	0.61	0.13	0.22	[illegible]	[illegible]	0.90	[illegible]	13.33	2.42
		2001-12	+1.93	+2.94	[illegible]	-7.87	+3.50	-0.91	-1.46	-1.34	-0.30	+4.17	-0.73	[illegible]	[illegible]	-0.02	-0.57	[illegible]	+0.82	-0.28	-4.47	[illegible]	+0.22

: Department of Economics and Statistics, Belagavi, Bagalkot and Kolhapur

Crop Diversification Index

Table No. 2

S.No	Talukas	Gibbs and Martin's Method		Change in DI
		2001-02 CDI	2011-12 CDI	2001-2012 DI
1	Ajra	0.79	0.78	-0.01
2	Badami	0.78	0.71	-0.07
3	Bagalkot	0.69	0.60	-0.09
4	Bailhongal	0.86	0.82	-0.04
5	Belgaum	0.80	0.74	-0.06
6	Bilgi	0.69	0.77	+0.08
7	Chandgad	0.73	0.72	-0.01
8	Chikodi	0.77	0.82	+0.05
9	Gadinglaj	0.81	0.75	-0.06
10	Gokak	0.82	0.79	-0.03
11	Hukkeri	0.73	0.83	+0.10
12	Mudhol	0.72	0.67	-0.05
13	Raibagh	0.75	0.70	-0.07
14	Ramdurg	0.83	0.70	-0.13
15	Soundatti	0.84	0.81	-0.03
Total		**0.86**	**0.85**	**-0.01**

* CDI – Crop Diversification Index
* Gibbs- higher the index value higher will be the diversification

Crop Diversification Categories - Table No: 3

Diversification Categories Range of Crop	Diversification Index	Name of the Talukas 2001-02	Name of the Talukas 2011-12
Low	< 0.7	Bagalkot and Bilgi	Bagalkot and Mudhol
Medium	0.7 – 0.80	Ajra, Badami, Chandgad, Chikodi, Hukkeri, Mudhol and Raibagh	Ajra, Badami, Belgaum, Bilgi, Chandgad, Gadinglaj, Gokak, Raibagh and Ramdurg
High	> 0.80	Ajra, Bailhongal, Belgaum, Gadinglaj, Gokak, Ramdurg and Soundatti	Bailhongal, Chikodi, Hukkeri and Soundatti

* Source : Computed by authors

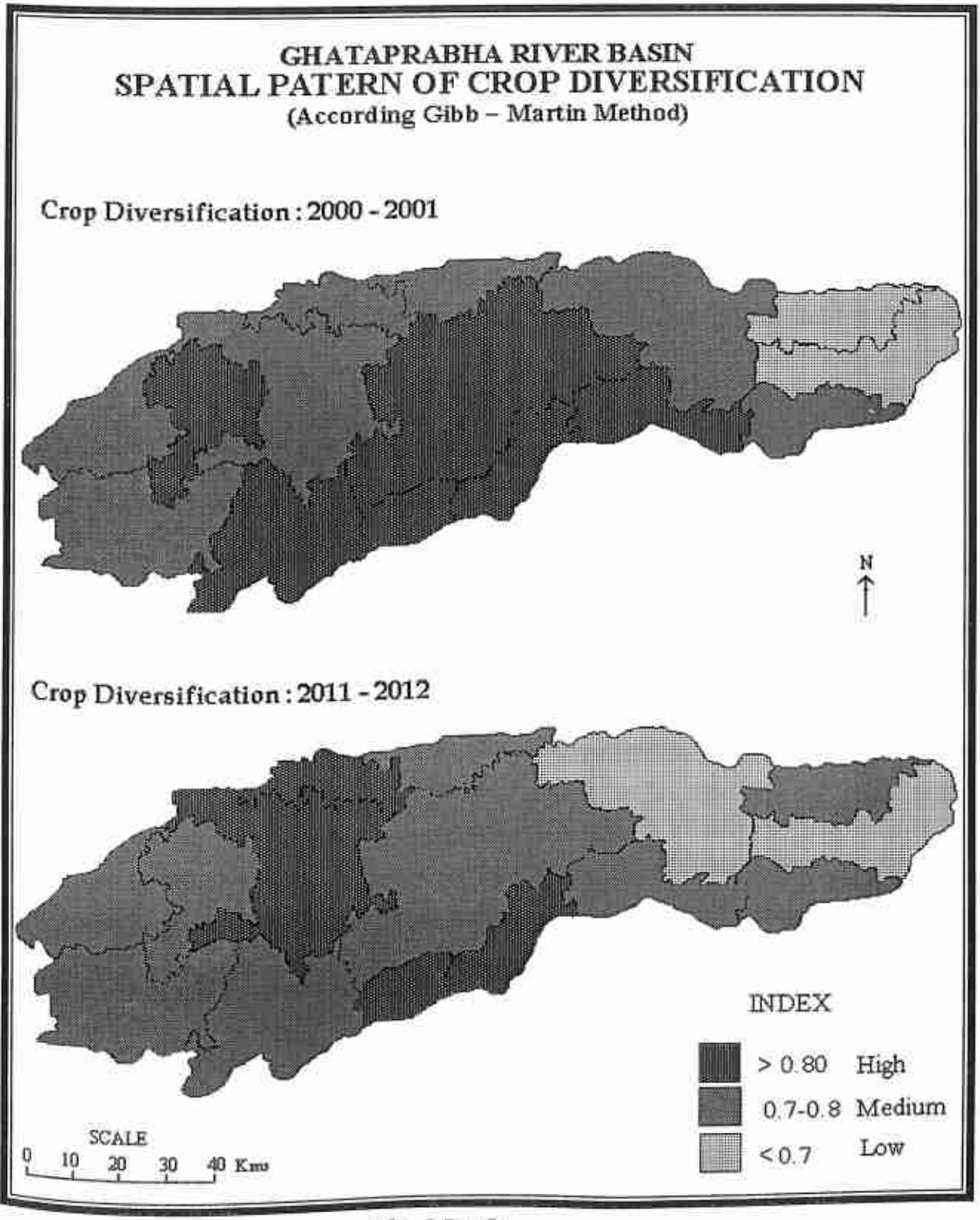
GHATAPRABHA RIVER BASIN
SPATIAL PATERN OF CROP DIVERSIFICATION
(According Gibb – Martin Method)
Crop Diversification : 2000 - 2001
N
Crop Diversification : 2011 - 2012
INDEX
> 0.80 High
0.7-0.8 Medium
< 0.7 Low
SCALE
0 10 20 30 40 Kms

Fig. No. 2

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Technology in Food Processing Industries in Promoting Agri-business in Karnataka

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Introduction

Karnataka is blessed with good climatic conditions, natural advantages to boost agricultural production and its growth. Karnataka being one of the most industrialized states in the country it is imperative that it develops modern practices, technologies and strategies to leverage the growing demand in both domestic and international markets.

In this context, the Government of Karnataka has introduced various policies to promote agribusiness sector and food processing industries towards the development of the economy. In order to develop the food processing industry, the Government of Karnataka has undertaken initiatives which would result in the effective utilization of resources, reduction of post harvest losses and contribute to the development of the state's economy in terms of production, employment and exports. The state of Karnataka is also credited as the first state in India to introduce budget separately for the agricultural sector. The state of Karnataka is known for its industrial and investor friendly policies, the availability of manpower, therefore there is tremendous scope for the growth and development of the food processing industries in Karnataka.

Agricultural sector being predominant in contributing towards the growth of the economy has evolved itself into agribusiness which has become a vast and complex system. Agribusiness has led to new processes which includes producing agri and farm products with more value addition with the help of latest technology and infrastructure. Food processing is an emerging industry that transforms the agricultural products into marketable food products for consumption and retaining the nutritional content of the processed food products. Agribusiness sector which includes business activities from farm to end product helps in creating employment and increased incomes.

Research Methodology

The present paper is a conceptual study based on the secondary sources of information which includes annual reports, policy reports, articles and journals.

Objectives of the Study

1. To understand the concept of agri -business
2. To understand the use of technology in the food processing industries in Karnataka

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3. To study the policies of the Government in promoting agri- business in Karnataka

1. The concept of agri business

Agribusiness may be defined as agriculture operated by business; it's a part of a modern economy which is related to the production, processing and distribution of food and the financial institutions that fund these activities. (Encyclopaedia Britannica Inc. (2011). In other words, agribusiness refers to any business activity related to agriculture, farming, processing, exporting, inpurt suppliers, trading and retailing. It often relates to agriculture and business-related activities, covering the multiple functions involved in modern food production and distribution. It covers agricultural input suppliers, producers, food processing, distributors, traders, exporters, retailers and consumers. Agribusiness and food processing industries are associated with large-scale farming involved in large-scale food production, processing, distribution and quality control of agricultural and processed food products.

The agribusiness system has undergone a rapid transformation as new industries have led to modern farming methods using latest technology. Agri -business refers to include too complex system of inputs, production, processing and marketing of farm products which are processed and stored with the help of modernized infrastructure. The agricultural sector has transformed itself emphasizing on agri food chain co-ordination, value creation and institutional framework attracting foreign investment. The World Development Report (2008) emphasizes for innovations in agriculture and technology as there is knowledge divide between industrial and developing economies because of growing private investment in research and development.

2. The use of technology in the food processing industries in Karnataka

Technology is indispensable for promoting the overall development in the economy. The application of technology in all the three economic sectors not only accelerates production but also improves the productivity and efficiency levels. The use of information technology (IT) services is very apparent in the agricultural and related activities. Technology has become important for more businesses today. The concept of agri infrastructure has revolutionized the agricultural sector , agro industries and food processing industries.

Agri- infrastructure includes modernization of existing facilities, post harvest infrastructure, collection centers, mobile processing units, cold chain facilities, sorting and grading facilities,

agri- clinics, agri -education, research and development. Agri- infrastructure includes the infrastructure for handling, preserving, processing and marketing of agro produce and increasing the shelf life of perishable fruits, vegetables, flowers, animal, dairy products ,product diversification and value addition for better profitability, minimizing wastage at all stages in the food processing chain by the development of infrastructure for storage, transportation and processing of agro-food produce, adoption of state of the art modern technology for food processing industries in the field of fruits and vegetable processing, food grain milling, dairy products, poultry and eggs, meat and meat products, fish, bread, oilseeds, breakfast foods, biscuits and other processed foods, specialized packaging for food processing industries.

The Agri-Business Incubators (ABI) are set up to encourage entrepreneurs having knowledge about agricultural technology, business consultancy and management principles. The setting up of agri -business incubators will create value and provides a good number of new opportunities for local customization of

products, employment and developing new technology.

The technological aspects related to agri businesses can be explained in the following

- Technical attributes relate to innovations, use of latest infrastructure facilities in the farming activities and food processing industries
- Business attributes relate to market demand, business opportunity, revenue potential and competitive advantage
- Social attributes relate to benefit to farmers, employment opportunities and impact on environment

The Agricultural Technology Information Centre (ATIC) has been set up to educate farmers in taking decisions and problem solving exercises. The Agricultural Technology Information Centre (ATIC) is a single window and a support system tied up with various research institutions to facilitate new learning and application of latest technical devices.

Objectives of the Agricultural Technology Information Centre (ATIC) include the following

- To facilitate easy access to the farmers and the institutional resources available in terms of technology, products like different strains of livestock, poultry, fish, fodder seeds and planting materials
- To provide greater coordination and intensive interaction between the researchers and technology users
- To focus on agricultural research and emphasize on location specific and system based sustainable technologies.

Quality assurance, codex standards, research & development (R&D) and promotional activities: Processing of food leads to preservation of food, enhances its flavor and reduces the toxins in the food product. It leads to better distributional efficiency and helps in the easy marketing of the food products. Reduction, recycling and efficient processing of wastes forms the core of waste reduction management in food processing industry. New concept such as Good Agricultural Practices (GAP) and Good Hygiene Practices (GHP) have been introduced in recent years to maintain international standards globalizing food production and ensuring food security, food safety , food quality and sustainable development of agriculture.

Individual Quick Freezing (IQF): This refers to a type of storage method where each individual piece of food or processed product is frozen separately. It includes fruits like and vegetables and later it was developed to freeze other products like meat, poultry and seafood products.Under this method fresh vegetables and fruits are selected then they are sorted, washed , peeled and cut into different sizes, blanched and frozen. Such type of freezing is common these days as we can find such frozen products both in wholesale and retail stores.

Pre-cooling: Pre-cooling refers to the removal of heat from the fresh vegetables and fruits before its put into the cold storage, but for pre-cooling a higher refrigeration capacity is needed. Pre-cooling is required for fresh fruits and vegetables if the distance is too long to reach the cold storage centres.

Mobile pre-cooling vans and reefer trucks: In order to extend the market life of fresh fruits and vegetables and maintain its freshness, it's important to lower the temperature and remove the field heat

from the products after post harvesting. When such type of cooling is completed before the products are transported it is known as pre-cooling.

Good Manufacturing Practices (GMP): It is a mechanism relating to the testing and controlling quality of the processed food products. The practice of manufacturing practices is also referred to current good manufacturing practices which include the techniques of testing, design and control. The Current Good Manufacturing Practices (CGMP) formed the basis for safety assurances in food processing, packaging, and storage facilities. It also implies the application of modernized and up graded technology in manufacturing products. The application of Good Manufacturing Practices (GMP) by the companies will satisfy the consumers and the products produced meet the quality standards. This will help in reducing the risk of contamination of the products produced.

Good Hygiene Practices (GHP): relates to application of healthy practices during production, use and maintenance of clean equipments. The hygiene practices include personal hygiene, water quality and clean working conditions. Good Hygiene Practices (GHP) ensure safe, healthy and sustainable food supply, and bring about awareness among consumers to demand safe and quality food.

3c) Policies of the Government in promoting agri -business in Karnataka

The Government of Karnataka has announced the agri- business policy in the year 2010 and the integrated agribusiness development policy in the year 2011 which focuses on not only promoting agribusiness but also food processing industries in the state.

Karnataka Agribusiness Development Policy (2010)

This policy was announced by the Government of Karnataka to promote agribusiness in the state with better technology and infrastructure supporting the growth of food processing industries there by reducing post harvest losses and following sustainable farming practices.

Objectives of the policy are as follows

- To facilitate flow of investment, technologies and modern management practices into the agri-business sector including food processing industries
- To address supply chain alignment and improvement of market access
- To adopt grading and food safety measures
- To increase exports, reduction in post harvest losses and adopt sustainable farming practices
- To increase the penetration of technology
- To allow for investment in agribusinesses and food processing industries
- To increase value realization through better marketing channels and sustainable practices in production, processing, branding and marketing

Karnataka Agribusiness Development Corporation (KABDC)

The agri -business development policy announced in the year 2010 created a special purpose vehicle known as the ,'Karnataka Agribusiness Development Corporation'. The Karnataka State Agricultural

Produce Processing & Export Corporation Limited (KAPPEC) was entrusted with the responsibility of managing and administering of Karnataka Agribusiness Development Corporation (KABDC). This special purpose vehicle (SPV) will also address bottlenecks in seed production, crop improvement, productivity, pre-harvest, post-harvest, storage, processing and packaging.

Objectives are as follows

- To identify project opportunities
- Conducting investors meets,
- Periodical follow up of investment queries, conclusion of MoUs, definitive agreements
- Acts as single window for all the clearances
- Record the progress of investments
- The functions of Karnataka Agribusiness Development Corporation (KABDC)
- To create an enabling environment for robust agriculture and agro-processing sector growth.
- To develop good institutional model to support both agriculture production and agro processing sector to address entire value-chain.
- To develop good business models and to address value chain through PPP mode- a Synergic and End-to-End model to attract more private investments in "Technology Support for Production", "Market Development" and "Agro Process Sector".
- To develop a mechanism to reallocate agriculture workforce who are involved in primary production into agri service sector through entrepreneurship mode.

Government of Karnataka Integrated Agribusiness Development Policy, 2011

The Government of Karnataka announced the Integrated Agribusiness Development policy in the year 2011. This policy focuses on developing state of the art technology, knowhow and avenues for international marketing for the agricultural products and processed food products. It aims to develop agri -infrastructure in agro based and food processing industries in order to promote sustainable agribusiness development in the state.

This policy has created Knowledge Support Cell which aims at creating awareness of improved agricultural technologies among the farmers, promotion of IT in agriculture, guidance to high-tech cultivation and precision farming, imparting agri- techniques for higher productivity, farmer field schools, developing sustainable technologies

Findings of the study

In order to promote agri- business and food processing industries it necessitates that there should be the use of latest modernized technology and innovations according to the World Development Report of 2008. The creation of a special purpose vehicle (SPV), Karnataka Agribusiness Development Corporation (KABDC) focuses on inviting investment into the agribusiness sector and identifies various opportunities to promote the same. The practice of good manufacturing practices (GMP) and good hygiene practices (GHP) results in a modernised, more diversified activities involvement in promoting the sustainable growth and development in the agri business and food processing industries.

Conclusions of the study

The setting up of food processing industries have gained momentum due to the policy initiatives undertaken by the Government of Karnataka and the support of the infrastructure technology. To promote the overall development in the agri business sector it is very important that the policy makers should encourage the farmers to adopt the technical methods in their farming activities which will help them in reducing post harvest losses and improve their incomes. The entrepreneurs should also be encouraged to set up food processing units in the state by providing them with technical inputs at reasonable prices so that it gives a boost to the development of agri business sector in general and the food processing industries in Karnataka in particular. This can be possible only with the application and the support of constant, latest developments in the field of infrastructure technology and innovations which leads to the production of a variety of diversified processed food products.

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