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PATTERN OF SUGARCANE CONCENTRATION IN SATARA DISTRICT OF MAHARASHTRA (INDIA)

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Abstract- In India, sugarcane is an important commercial crop. The sugarcane plant is a tropical plant and has been known in India from earliest times. Its reference is found in Atharva Vedda, before 3000 to 7000 years ago. India is the fourth major sugar producing country in the world, the first being Russia, Brazil and Cuba. Indian sugar industry has lion's share in accelerating industrialization process and bringing socio-economic changes in under developed rural areas. About 4.5 crore farmers are engaged in sugarcane cultivation in India. Sugar factory (Co-operative, private and public) has been instrumental in initiating a number of entrepreneurial activities in rural India. In Maharashtra 10, 39,000 hectares area under sugarcane cultivation especially in western Maharashtra and 91 lakh million tonnes sugar production (2010-11). In Satara district 70,538 hectares area under sugarcane cultivation and 10 sugar factories are run (2010-11). The first sugar factory was established in 1957-58 namely Shriram Sahakari Sakhar Karkhana Ltd. Phaltan. Today 10 sugar factories crushed in Satara district. The increase in sugar cultivated area and growth of sugar industry has manifold effects on socio-economic conditions in the district. This attempt has been made to 2000-01 to 2009-10 area under sugarcane cultivation in Satara district.
Key Words- Cultivation, Pattern, Factory, Area, Concentration, Index

Introduction

In India, sugarcane is an important commercial crop. It is widely grown is different parts of the country. At present India is the fourth major sugar producing country in the world, the first being Russia, Brazil and Cuba. Sugar industry occupies an important place among organized industries in India. Sugar industry one of the major agro-based industrial in India has been instrumental in resource mobilization, employment generation and creating social infrastructure in rural areas. At present there are 693 registered sugar factories, which are mostly in co-operative sector; sugar industries can provide number of growth centers in rural India. In India highest area under sugarcane has brought socio-economic changes in rural India by way of facilitating entrepreneurial activities such as dairies, poultries, fruits and vegetables processing and providing educational, health and credit facilities.

The major sugarcane production is Maharashtra, Uttar Pradesh, Uttaranchal, Bihar, Punjab, Haryana, Madhya Pradesh, West Bengal, Rajasthan, Assam and Gujarat. Maharashtra is the second largest sugarcane growing State in the country. It contributed 13.53 per cent hectare to total area and 15.06 per cent to total production of sugarcane in the country. The potential of Maharashtra has been shown by the steady growth in area and production over the years. However, the unceasing decline in productivity in recent decades is a cause of great concern. Sugarcane is also the second most important cash crop covering less than three per cent of the total cropped area of the State, but it utilizes more than 60 per cent of the total water available for irrigation in the State. In Maharashtra there are 124 sugar factories in co-operative sector and 46 sugar factories are in private sector. No other agro based industry can compete with it having great impact on the economic conditions of the farmers, who constitute the bulk of share holders of the factories, which are mostly in co-operative sector; therefore sugar industries can provide number of growth centers in rural Maharashtra. In Satara district has area under sugarcane cultivation 70538 hectares and 10 sugar factories during the year 2009-10. In Satara district Karad, Satara, Phaltan and Koregaon tahsils leading of sugarcane producers.

Study Area

The Satara district is situated in west part in Maharashtra State. This district consists eleven tahsils covering 1739 villages. The total area extend is of 10,480 sq. km. extending from 17^0 5' to 18^0 11' north latitudes and 73^0 33' to 74^0 54' east longitudes. The climate ranges from the rainiest in the Mahabaleshwar region which has an average annual rainfall of over 6000 mm. to the driest in

Man, Phaltan, Khandala and Khatav tahsils where the average annual rainfall is about 500 mm. (Fig. 1).

Objectives

The present study was undertaken with the following objectives

1. To study the growth of area of sugarcane cultivation.
2. To identify areas of tahsil-wise sugarcane concentration on the basis of Bhatia's method.

Data Base and Methodology

The study was conducted in Satara district of Maharashtra. The present study is based on secondary data collected District Statistical Office, Department of Agriculture Satara District. Season and Crop Reports published by the Department of Agriculture (1999-00 to 2009-10). Socio-economic Review of Satara District, District Census Hand Book, Gazetteer Agricultural Epitomes. Agricultural Statistical information Maharashtra State etc. were also scanned for setting relevant information. Simple Statistical method has used to compute individual crop area concentration by Bhatia's (1965) method is used for the calculation of the Location Quotient.

Sugarcane cultivation in Satara District

Satara district is considered as the core district in western Maharashtra for cultivation of sugarcane. In Satara district is leading in sugarcane production as it covers 8.94 per cent of total hectares in the State. In the Satara district of Karad, Satara, Koregaon and Phaltan tahsils is more and hectares area under sugarcane cultivation is also more. Satara district is one of the major sugarcane cultivation in Maharashtra (Table1).

Source: Season and Crop Report Satara District

Above Table No. 1 and Fig No 1 and 2 shows that the Karad, Satara, Koregaon and Phaltan tahsils are the major leading sugarcane producers in the district. Six tahsils viz., Jaoli, Patan, Khandala, Khatav and Man tahsils contributed only 21 per cent area under sugarcane cultivation. Karad tahsil is the highest area (37.87%) under sugarcane cultivation during the year 1999 to 2009. Phaltan (16%), Koregaon (14.85%), Satara (11.17%) covered the area these four tahsils 79 per cent area under sugarcane cultivation in the district. Agriculture is the main land use in the district more than 75 per cent of the total area being used for agricultural activities. The monsoon period starts in the month of June with the maximum precipitation in July and August. Krishna is the main river in the district; main tributary is Koyana, which also originates near Mahabaleshwar, flows in a north-south direction till

Helwak built up Shivaji Sagar Dam on Koyana river. Bhima basin covering 30 per cent of the district in the north eastern part and the Krishna basin over the remaining part. In the Satara district, Koyana dam on the Krishna river, Veer dam on the Nira river and Kanher dam on the Krishna river. This dams perennial water available for sugarcane crop. Black cotton soil is the predominant soil type found here as is the case with most of the district on the Deccan Plateau. This soil is found in central part of the district. In Phaltan and Khandala tahsils the soil has low, fertility and is rocky except for the area along the Nira River and its tributaries. Khatav and Man, some part of Khandala tahsil low rainfall, rocky soil in summer season high temperature, shortage of water, so sugarcane cultivation is low.

In the western part of the Satara district not suitable sugarcane cultivation crop. Hilly areas, laterite soil, typically clayey in nature and sugarcane cultivation are unflavored region.

Concentration of sugarcane cultivation

The pattern of crop concentration reveals the variation in the intensity of crop in the given region at a point of time (Jadhav, 1984). The crop concentration patterns are mainly to differentiate the areas of high and low density of individual crop in the different parts of the region.

Location Quotient measures the degree to which a specific region contains more or less than its briefly indicating a ratio's (Location Quotient = X / Y), (Gupta and Hiran, 1973, Das, 1990). In order to determine the tahsil-wise concentration of crops Bhatia's method is used for the calculation of the Location Quotient. The following formula is used to work out the concentration of sugarcane cultivation in Satara district.

Formula $$LQi = \frac{Xij \div Xj}{Yi \div Y}$$

Where,

LQi = Location Quotient of sugarcane cultivation in the district.

Xij = Area under sugarcane in the tahsil.

Xj = Total cropped in the tahsil.

Yi = Total tahsil area under sugarcane cultivation in the district.

Y = Total cropped area of the district.

Bhatia's Location Quotient is present in the form of concentration Index Table 2. If the Index is more that the concentration of particular crop in the unit area (Tahsil) is high and vise-versa. By using the equation the tahsil-wise Index value are calculated at district level.

In Satara district during 2000-01 Karad tahsil shows the very high concentration area under sugarcane cultivation. In Satara district it is mainly raised in the areas of Koyana dam, Dhom dam, Urmodi dam and Kanher dam. Water use in sugarcane crop to be optimized to maximize production, Technological innovations like sprinkler and drip irrigation high yielding tonnage sugarcane (Fig.4). The development of high yielding varieties of sugarcane, increased inputs of chemicals fertilizers and better this perennial crop management. Phaltan, Koregaon and Satara tahsils high sugarcane concentration. Wai tahsil medium, Patan and Khandala tahsil is low concentration. The eastern part of the Satara district is Man and Khatav tahsils has drought prone area, scarcity of water supply, erratic monsoon, vagaries of monsoon sugarcane concentration show that the very low concentration. The western part of the Satara district in Jaoli tahsil index value comes 0.07 in 2000-01 sugarcane concentration is showing very low.

In Satara district during 2009-10 above Fig. 5 shows that the very high concentration in Karad tahsil, high sugarcane concentration Phaltan, Koregaon and Satara tahsil. The central part of the Satara district provided ample water, increasing irrigation intensity, fertile soil and better management obtained high acreage tonnage. The medium sugarcane concentration is Wai tahsil. Khandala, Khatav and Patan tahsils shows low sugarcane concentration. Man and Jaoli tahsils very low sugarcane concentration. The Mahabaleshwar tahsil sugarcane areas are not suitable for this crop.

Sugarcane crop grows best in areas with temperature 20^0 C in winter season and 38^0 C in summer season in Satara district. A long rainy season in western part of the Satara district of 600cm rainfall season of four to five months, dry winter, cool season. Sugarcane is planted either tradistional method in furrow or trenches. In Satara district it is done in October-March for the 12^{th} month crop, Karad, Phaltan, Satara, Wai and Koregaon tahsils are important producing tahsils where the soil is fertile and irrigation facilities ample.

Conclusion

Sugarcane cultivation is largely controlled by the physio-socio-economic conditions prevailing in the district. Regional disparity in the proportion of sugarcane area to total cropped area is mainly related to the availability of consistent supply of water. The area of sugarcane cultivation is dependent on shortage of water, scarcity of monsoon, low yield, high cost of cultivation, vagaries monsoon, uneven rainfall distribution, supporting of price. After development of Co-86032, Co-265 high yielding varieties practiced new variety, provided of canal water timely high acreage production. The farmers faced by the various problems poor quality fertilizers, shortage of fertilizers, manures, weeding, leveling of pot, sugarcane cutting and labor problems especially crushing time.

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Table 1- Satara District:Tahsil-wise area of sugarcane cultivation (Area in ha)

Year	Satara	Jaoli	Koregaon	Wai	Khandala	M.war	Phaltan	Khatav	Man	Karad	Patan
1999	5920	237	5903	2447	1137	-	8619	1239	249	20188	2483
2000	5960	507	7483	1943	1245	-	7725	1280	346	20174	3450
2001	5460	318	8037	1952	1150	-	8662	1279	344	20161	3450
2002	5490	343	8105	1898	1111	-	8555	801	321	17792	3513
2003	2752	556	8128	1269	986	-	7960	36	29	17792	3194
2004	5497	519	7877	1766	1116	-	8178	1148	1190	14497	3460
2005	7068	593	7008	1789	1159	-	8741	1526	1245	19497	3497
2006	6523	382	8166	3856	1302	-	10525	3306	1289	19432	3739
2007	5840	780	7980	3566	1260	-	8410	1498	1960	22213	4816
2008	6429	952	8439	3768	1487	-	9942	3228	2146	21149	4898
2009	7689	1246	8748	3952	1548	-	10542	3540	2291	26073	4909
Total	64628	6433	85874	28026	13501	-	97859	18881	11410	218968	41409

Table 2- Satara District:Tahsil-wise sugarcane crop concentration (Area in ha.)

Sr. No	Tahsil	2000-01	Index Value	2009-10	Index Value
1	Satara	5960	1.51	7689	1.47
2	Jaoli	507	0.07	1246	0.29
3	Koregaon	7483	1.61	8740	1.19
4	Wai	1943	0.76	3959	0.85
5	Khandala	1245	0.42	1548	0.39
6	Mahableshwar	-	-	-	-
7	Phaltan	7725	1.37	10542	1.47
8	Khatav	1280	0.18	3540	0.40
9	Man	346	0.03	2291	0.18
10	Karad	20177	3.91	26073	3.70
11	Patan	3450	0.40	4901	0.55

Source: Season and Crop Report Satara District and Computed By the Researcher.

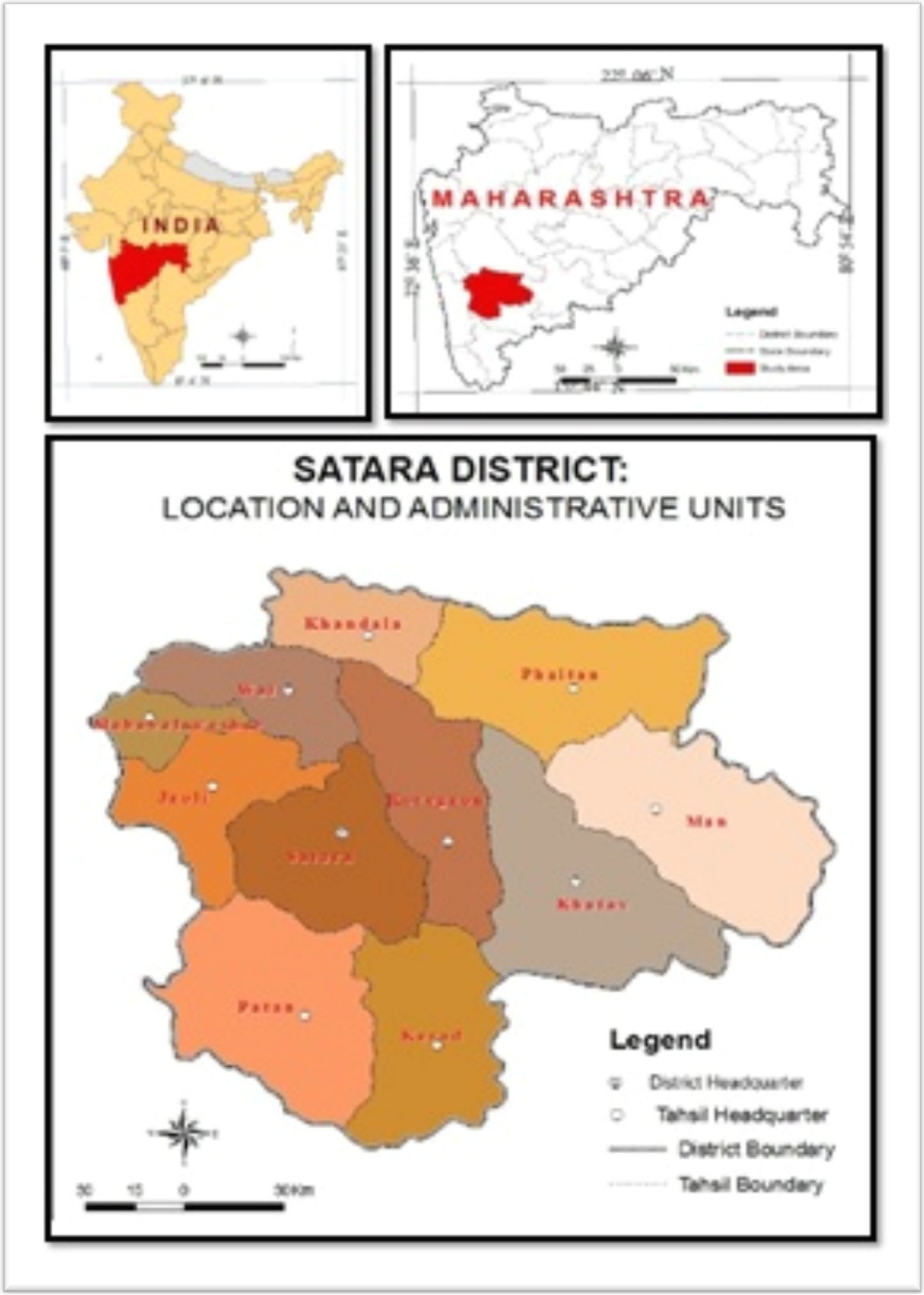
INDIA
MAHARASHTRA
Legend
SATARA DISTRICT:
LOCATION AND ADMINISTRATIVE UNITS
Khandala
Phaltan
Wai
Mahabaleshwar
Javli
Satara
Koregaon
Man
Khatav
Patan
Karad
Legend
District Headquarter
Tahsil Headquarter
District Boundary
Tahsil Boundary
30 15 0 30Km

Fig.1

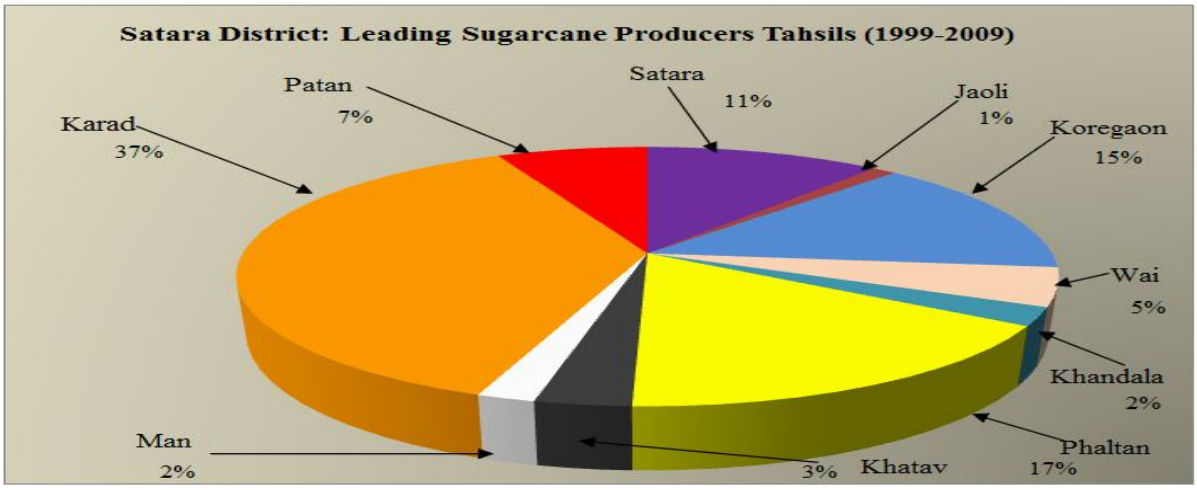

Fig.2

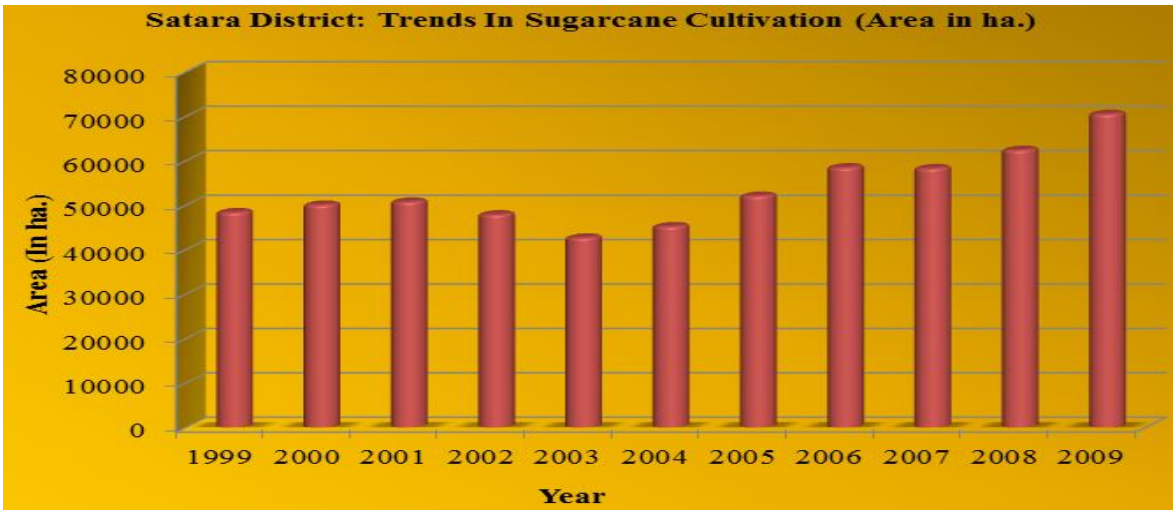

Fig.3

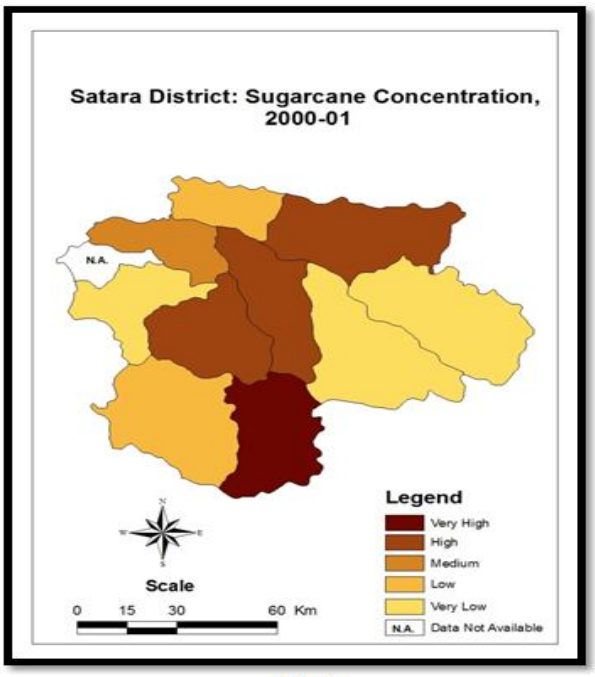

Fig.4

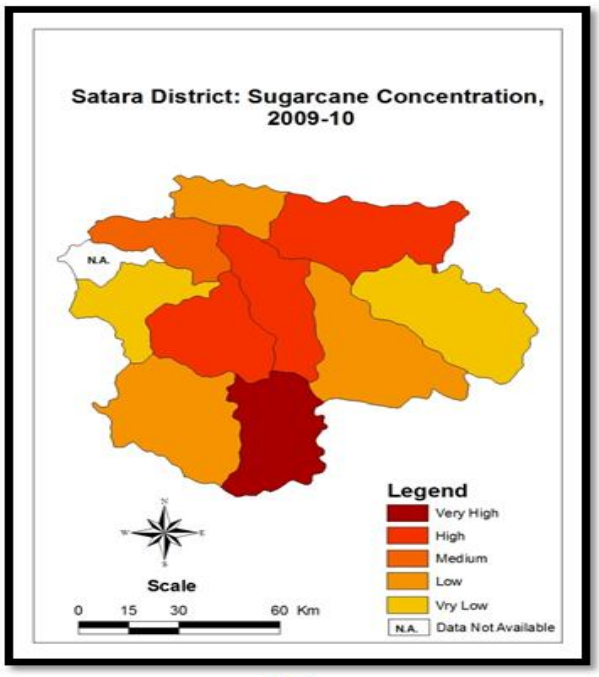

Fig.5