

A Case Study of Rice Crop in GIS Accordance Application of Geographical Information System of Trimbakeshwar Tehsil

Santosh Tukaram Jadhav

Department Of Geography, M.V.P.Samaj's, Karmveer Abasaheb Alias N.M.Sonawane, Arts, Commerce And Science College, Satana, MS, India

Abstract

This research paper reports a case study on the application of Geographic Information System in Development of Major Crop Information System (MCIS) for sustainable rice production in Trimbakeshwar Tehsil which is located (19°56'23.73"N to 19°55'41.43"N Latitudes and 73°32'18.34"E to 73°31'22.38"E longitude) in Nashik district of Maharashtra, India. There rice fields were identified through GIS techniques. Aus, this three types of paddy (rice) distribution were shown using Socio-economic data. The secondary data were collected from the Assistant Director's office of Agriculture, Trimbakeshwar Tehsil. The cultivated area of different types of rice is calculated from each Gram Panchayet. The both data of rice area one which has been calculated by Remote Sensing method and another one which has been collected from ADA office are compared. Field data is used to generate the variation curve of different types of rice production in the Trimbakeshwar Tehsil. It is also shown the gradually changing of rice cultivated area in this Trimbakeshwar Tehsil. Finally, it is observed that all the geographic queries carried out in this research are as a result of the available dataset. So that, the decision making bodies can access to information on rice growth and management in the study area.

KEYWORDS: Geographical Condition of the study area, GIS, Spatial distribution, Rice Information System.etc

Introduction

Rice is the single produce, around which agricultural activities of the district rotates. If Nashik district is known as "The Rice-bowl of Maharashtra", then Trimbakeshwar is truly called the "Greenery of Nashik". Nashik District of Maharashtra state assumes a very important role in the overall agricultural production. Trimbakeshwar Tehsil of Nashik is one of the high yielding rice producing area in Nashik.

Purpose of study area

There are many reasons to select this for the study area. The study region is the one of the typical and important tract in Nashik District in Maharashtra. There is not a single comprehensive study at a micro level about A case study of Rice Crop in (GIS) Application of Geographical Information System of Trimbakeshwar Tehsil. Major aim of the study is to know realistic picture of existing agricultural Rice crop in the study area. Selection of this area also calls for such an analytical study because there is imbalance in agriculture development and planning, which made all part of backward. Because study area is backward Tehsil the purposed study is know how to agricultural development and planning in Trimbakeshwar Tehsil and response to characteristics of

watershed in study area. This is study region has many problems in agriculture. To find out such problems in agriculture and to suggest suitable solution for that, it is one of the reason for the selection of this topic.

Importance of the study area

This study was undertaken in the Trimbakeshwar Tehsil located in the Nasik District in state of Maharashtra. An initial reconnaissance of the study area revealed that this region was affected by the problem of land degradation, loss of top soil, flooding during rains, reduced agriculture development and lack of adequate infrastructure etc. therefore, there an urgent need for intervention in the agriculture to development a detailed database for use of various line departments and stakeholders as well as holistic land and water resource development and planning taking into account the prevailing socio-economic conditions and felt needs assessment.

Study Area

Trimbakeshwar Tehsil is situated partly in the Dhamanganga basin and partly upper Godavari Basin. It lines between 19°56'23.73"N to 19°55'41.43"N Latitudes and 73°32'18.34"E to 73°31'22.38"E longitude. Trimbakeshwar Tehsil has an area of 95575.74 sqkms. And population 168423 as per the 2011 census book. There are 97 villages and 28 padi and three revenue circle are in the Trimbakeshwar Tehsil. The main system of hill is the sahyadris, which run north south in the western portion of the district. The main from Sayadries range, two prominent spurs stretch out to the east of study area. In the extremes north are Dhamanganga hill, basin and which approximately forms and boundary between Peth and Trimbakeshwar Tehsil. The Tehsil has three rivers namely Dhamanganga River, Godavari River and Vaitarna River. The Tehsil are surrounded by Thane district is the western. Peth Tehsil is the north, Nashik Tehsil is eastern and Igatpuri Tehsil is South of Trimbakeshwar Tehsil. There are four types of soil in the Trimbakeshwar Tehsil black, red, red and black, light Broun, Rice, Sugarcane, Onions, Grapes, Bajara, Nachani and vegetables are the dominant crops of the study region. The climate of the Tahsil generally dry expect during the monsoon season. The average annual rainfall of the dominant and a whole is 1034.5mm. They rainfall in general decrease from west to east. The summer season is moderately hot and the temperature various from 36⁰.0 to 43⁰.0. The air is humid during the monsoon season is generally dry during nest of the year.

Objectives of Study Area

This research paper has been undertaken to make on in-depth and "A case study of Rice Crop in GIS Application Geographical Information System of Trimbakeshwar Tehsil" by evaluating following objectives:-

- Assessing the physical background of study area.
- To assess Application of GIS in Major Crop Information System namely, Rice in the study region.

Methodology of Study Area

The present study is based on the primary and secondary source of data. Primary data is collected from the field work (2001-2011) and interviews of 122 farmers from the study region. Secondary data is obtained from the socio-economic abstract of the Nashik district (2013), District census handbook and District Gazetteers. These data obtained to show the production curve of different types of rice and the change of rice cultivated area in the last five years. The GPS point was taken in rice area of Trimbakeshwar Tehsil and put it into the image. Lastly, we have calculated rice crop area from each gram panchayets and comparing the area data which are calculated from RS method with the field collection data.

Result And finding

Rice is the most important crop of that Trimbakeshwar Tehsil. The Rice grown with its numerous varieties can broadly be grouped under the three primary classes distinguished from one another by distinct characteristics and those are: The Aus or autumn, the Amana or winter and the Boro or the summer rice. Paddy covers maximum of gross cropped area of Trimbakeshwar Tehsil. There are mainly seven classes are shown, Agricultural land, Vegetative land, Sandy area, Water body, Built-up land, Flood prone area and Water-logged area. Godavari River and Darkeswar, the two rivers are the main water portion of that area. The water-logged area is the storage water for agricultural usage. The flood prone area is already flood affected and potentially flood affective area. The main purpose to generate the land use and land cover map is to show how much agricultural land is there than any other land use & land cover features. Basically the Trimbakeshwar Tehsil is the one crop land area. So in agricultural land there is mainly rice cultivated-area among any other crop.

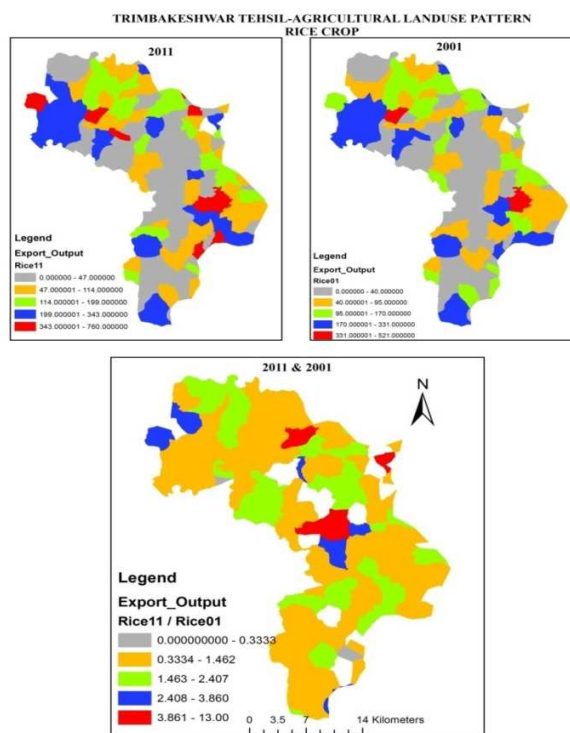
Table-01 Rice of Trimbakeshwar Tehsil

	Name	Net Sown Area	Rice		Name	Net Sown Area	Rice
1	Adgaon (Harsul)	525	30	26	Deodongari	452	6
2	Alwand	425	24	27	Deogaon	623	42
3	Ambai	152	47	28	Deola	352	34
4	Amboli	452	30	29	Devergaon	258	664
5	Amlon	875	38	30	Dhadoshi	321	797
6	Anjanneri	456	189	31	Dhargaon	456	199
7	Aswaliharsha	325	45	32	Dhumodi	756	986
8	Avhate	352	40	33	Divyachapada	352	32
9	Bafanvahir	253	25	34	Gaddawane	321	354
10	Behedpada	123	130	35	Ganeshgaon naik	521	122
11	Belpali	245	342	36	Ganeshgaon Waghera	265	218

12	Berwal	57	303	37	Gavatha	213	1105
13	Beze	56	65	38	Goldari	654	99
14	Bhagohol	450	147	39	Goldari	358	174
15	Bhilmal	245	5	40	Gorthan	752	755
16	Bhutmokhada	125	5	41	Govindpuri	456	157
17	Boripada	215	6	42	Harshewadi	578	132
18	Bramhanwade	358	38	43	Harsul	658	144
19	Chikhalpada	453	14	44	Hatlonchi	354	58
20	Chinch Ohol	245	167	45	Hirdi	254	199
21	Chinchwad	514	7	46	Jategaon Bk	351	424
22	Chirapali	354	26	47	Jategaon Kh	652	272
23	Chokore	452	148	48	Kacharpada	654	103
24	Dapure	358	3	49	Kachurli	321	47
25	Deodongara	245	28	50	Kalamuste	354	51
26	Deodongari	452	6	51	Kalmuste	652	88
27	Deogaon	623	42	52	Kas	354	36
28	Deola	352	34	53	Kedegaonpada (N.V)	621	57
29	Devergaon	258	664	54	Khadakohol	654	332
30	Dhadoshi	321	797	55	Khairaypali	654	799
31	Dhargaon	456	199	56	Khambale	952	105
32	Dhumodi	756	986	57	Khamshet	874	35
33	Divyachapada	352	32	58	Kharoli	351	466
34	Gaddawane	321	354	59	Kharpadi	325	342
35	Ganeshgaon naik	521	122	60	Kojoli	621	65
36	Ganeshgaon Waghera	265	218	61	Kone	321	58
37	Gavatha	213	110 5	62	Kotambi Harsul	621	533
38	Goldari	654	99	63	Kulwadi	325	93
39	Goldari	358	174	64	Mahadeo Nagar	235	94
40	Gorthan	752	755	65	Malegaon	231	139
41	Govindpuri	456	157	66	Met Chandrachi	321	100
42	Harshewadi	578	132	67	Met Humbhachi	648	182
43	Harsul	658	144	68	Met Yelyachi	632	304
44	Hatlonchi	354	58	69	Metghar Killa	546	97
45	Hirdi	254	199	70	Metkawara	324	296

46	Jategaon Bk	351	424	71	Mhasurli	321	114
47	Jategaon Kh	652	272	72	Mulegaon	624	279
48	Kacharpada	654	103	73	Mulvad	513	292
49	Kachurli	321	47	74	Murambi	642	343
50	Kalamuste	354	51	75	Nachlondi	652	135
51	Kalmuste	652	88	76	Nagosali	321	760
52	Kas	354	36	77	Nandgaon	656	62
53	Kedegaonpada (N.V)	621	57	78	Nandurkipada	652	554
54	Khadakohol	654	332	79	Nirgude (Harsul)	654	74
55	Khairaypali	654	799	80	Ozar Khed	256	417
56	Khambale	952	105	81	Pahine	1214	529
57	Khamshet	874	35	82	Pegalwadi	1011	300
58	Kharoli	351	466	83	Pegalwadi Tryambak	3256	621
59	Kharpadi	325	342	84	Pimplad Trimbak	324	478
60	Kojoli	621	65	85	Pmpri Trimbak	1232	143
61	Kone	321	58	86	Rajewadi	652	111
62	Kotambi Harsul	621	533	87	Rautmal	365	0
63	Kulwadi	325	93	88	Rayate	632	219
64	Mahadeo Nagar	235	94	89	Rohile	658	93
65	Malegaon	231	139	90	Samundi	752	102
66	Met Chandrachi	321	100	91	Sapatpali	954	494
67	Met Humbhachi	648	182	92	Sapgaon	865	244
68	Met Yelyachi	632	304	93	Sapte	215	631
69	Metghar Killa	546	97	94	Sasune	652	681
70	Metkawara	324	296	95	Sawarpada (n.v.)	326	159
71	Mhasurli	321	114	96	Shevgedang	625	134
72	Mulegaon	624	279	97	Shevkhandi	310	437
73	Mulvad	513	292	98	Shirasgaon	510	80
74	Murambi	642	343	99	Shirasgaon	650	13
75	Nachlondi	652	135	100	Shivaji nager (n.v.)	356	846
76	Nagosali	321	760	101	Shomanath nager (n.v.)	589	245

77	Nandgaon	656	62	102	Take Deogaon	658	254
78	Nandurkipada	652	554	103	Take Harsha	845	300
79	Nirgude (Harsul)	654	74	104	Talegaon Trimbak	652	621
80	Ozar Khed	256	417	105	Talwade Trimbak	856	478
81	Pahine	1214	529	106	Thanapada	654	143
82	Pegalwadi	1011	300	107	Torangan	352	111
83	Pegalwadi Tryambak	3256	621	108	Torangan	652	497
84	Pimplad Trimbak	324	478	109	Trimbak	3012	219
85	Pmpri Trimbak	1232	143	110	trimbakeshwa r	3652	93
86	Rajewadi	652	111	111	Umbharande	632	1025
87	Rautmal	365	0	112	Vadholi	985	494
88	Rayate	632	219	113	Vaghera	658	244
89	Rohile	658	93	114	Varasvahir	658	631
90	Samundi	752	102	115	Vatakapada	759	681
91	Sapatpali	954	494	116	Vaviharsha	658	109
92	Sapgaon	865	244	117	Vele	458	134
93	Sapte	215	631	118	Water	1254	437
94	Sasune	652	681	119	Waygholpada	3652	254
95	Sawarpada (n.v.)	326	159	120	Welunje	359	13
96	Shevgedang	625	134	121	Zarwad Bk	632	0
97	Shevkhandi	310	437	122	Zarwad Kh	325	0
98	Shirasgaon	510	80				
99	Shirasgaon	650	13				
100	Shivaji nager (n.v.)	356	846				



Source: Tehsil office of Trimbakeshwar Tehsil 2001-2011.

Conclusion

In this study, a comprehensive search on Development of Crop Information System (CIS) for sustainable rice production has been done. This is expected to allow the farm managers and decision makers to carry out more research on what, where, and how best could this be of benefit in various systems/methods of farming for sustainable rice production. GIS can be very efficiently used for precise crop area estimation and provision of crop maps. On the other hand, available Socio- Economic Review data is suitable to extract rice cultivated field. Both the spatial and the attribute data have been created for the purpose of comprehensive decision making in agricultural practice. The decreasing curve of rice production can be changed the improvement of this area. Government should encourage the development of Crop Information System (CIS) for rice with all crops in the entire Trimbakeshwar Tehsil as a whole.

VII. References

- Csornai, G., dr. Dalia, O., Farkasfaly, J., Nádor, G., 1990. Crop Inventory Studies Using Landsat Data on Large Area in Hungary, Applications of Remote Sensing Agriculture, Butterworths, pp. 159-165.
- Remote Sensing Applications, National Remote Sensing Centre (NRSC), Agriculture (Page 1- 20), Sesha Sai MVR, Ramana KV & Hebbar R.

Monitoring Of planting paddy rice with complex cropping pattern in the tropical humid climate region using landsat data by

S. Uchida, Development Research Division, Japan International Research Center for Agricultural Sciences (JIRCAS)

Uchida, S., 2007. Monitoring of paddy rice planting with complex cropping pattern using satellite remote sensing data –A case