

## VALUATION OF CROPPING PATTERN AND WATER RESOURCES APPLICATION: A CASE STUDY OF MALSHIRASTAHSIL, SOLAPUR

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### Abstract

Irrigation has come an important aspect of agriculture. Lately irrigation has come more essential and without it most crops cannot be grown. It becomes basically part due to variability of thunderstorm and uneven distribution of downfall throughout the time. Indeed, those crops, which grow during the stormy season, also depend upon irrigation because growers try to wash the crops in time so that crops might be ready in time and give advanced yields. In case of failure of downfall use of irrigation becomes much further essential areas growing multiple crops need ferocious irrigation installations. Thus, present exploration work stressed the cropping pattern and water coffers application of Malshiras tahsil. The study area lies under rain shadow and semiarid region in the Maharashtra. The irrigation water resource vacuity and operation practices were seen from the study area in relation with a cropping pattern during 2011 to 2021. Substantially the irrigation practices increase chronologically with changes in land use and cropping pattern, i.e. semi-arid crop to cash crop which significantly increased and increase in face water irrigation installations.

**Keywords:** Cropping Pattern, Irrigation Amenities, Water Resources

### Introduction:

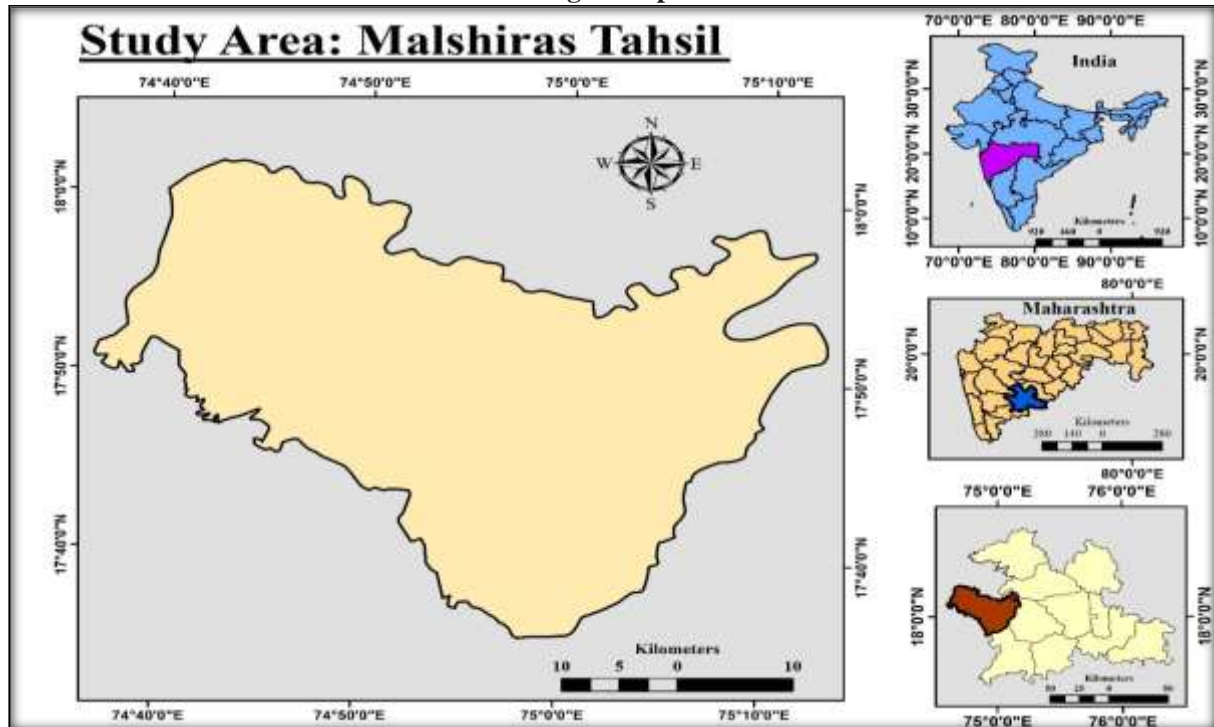
Irrigation has come an important aspect of husbandry. lately, irrigation becomes most essential and without it most crops cannot be grown. It becomes essential part due to variation of downfall thunderstorm and uneven distribution of downfall throughout the time. Indeed, those crops, which are grown during stormy season, also depend upon irrigation because growers try to wash the crops in time so that crops might be ready in time and give advanced yield (Spatarshi, 1993). In case of failure of downfall use of irrigation becomes much further essential areas growing multiple crops need ferocious irrigation installations. Although, the modernization in the irrigation practices cannot abide the rainwater vacuity. Rainwater is considered as base of irrigation. shy downfall disturbs the ground water vacuity in the coffers and gutters, conduits, get dry and growers came replace the significance of rainwater. Irregularities in thunderstorm pattern in space and time, makes the artificial irrigation practices are essential for utmost of the crops cultivated in the region. Whereas sugar club, groundnuts etc. are completely depend on artificial irrigation. The face water irrigation practices like the tank, swash, conduit, and lake play vital part in irrigation. The underground water is also being tapped by dug and tube wells and these came important due to support.

### Study Area:

According to Census 2011 information the position law of Malshiras tehsils 562439. Malshiras tehsils is in Malshiras tehsil of Solapur quarter in Maharashtra, India. It is positioned 6 km down from sub-district headquarter Malshiras (tehsildar office) and 125 km down from quarter headquarter Solapur. As per 2009 stats, Malshiras tehsils is also a gram panchayat. The total geographical area of tehsils is 3544.78 hectares. Malshiras has a total population of 985 peoples, out of which manly population is, 378 while womanish population is, 607. knowledge rate of Malshiras tehsils is 69.05 out of which 74.38 males and 63.33 ladies are knowledgeable.

Malshiras is one of the 11 blocks of Solapur quarter and it extends roughly between authorizations 17° 36' North and 18° 2' north and between longitudes 74° 41' east and 76° 18' east. The block is on the western side of the quarter. Malshiras tahsil is positioned on the west borderline of Solapur quarter and lies entirely in Nira basins. The tahsil is bounded on the north by Indapur tahsil (Pune quarter) on the north-east Madhatahsil, on east by Pandharpur tahsil, on south by Sangola, on west by Man tahsil (Satara quarter) and north-west side Phaltan (Satara quarter). In the west part of Malshiras taluka Mahadeo hilly range pass north to south for a many kilometers and Sulski (715m) is height pick in Malshiras tahsil and many scattered hills in Malshiras tahsil. (Fig.1)

Fig. 1 Map

**Objective:**

1. To evaluate the cropping pattern and water resources application of the study area with reference to Solapur District.

**Database and Methodology:**

The present paper is primarily based on secondary data. The data on census year have been collected. Considering a tehsilas a unit for the Malshiras tahsil in Solapur district of Maharashtra, the data have been collected from tehsils Panchayat Samiti, Tahsil office Malshiras, Department of irrigation, socio-economic review book, and statistical abstract of Solapur district. The data pertaining to the period from 2011 to 2021.

Further all sorts of published and unpublished data were processed and then suitable maps and diagrams, represented data, choropleth maps, graphs have been constructed and interpreted. Prepare a base map of tahsil for analysis the subject matter. We are studying the methods necessity to subject. e.g. area irrigated under different source, irrigated area under different crop and land utilization etc.

**Irrigation Intensity: -**

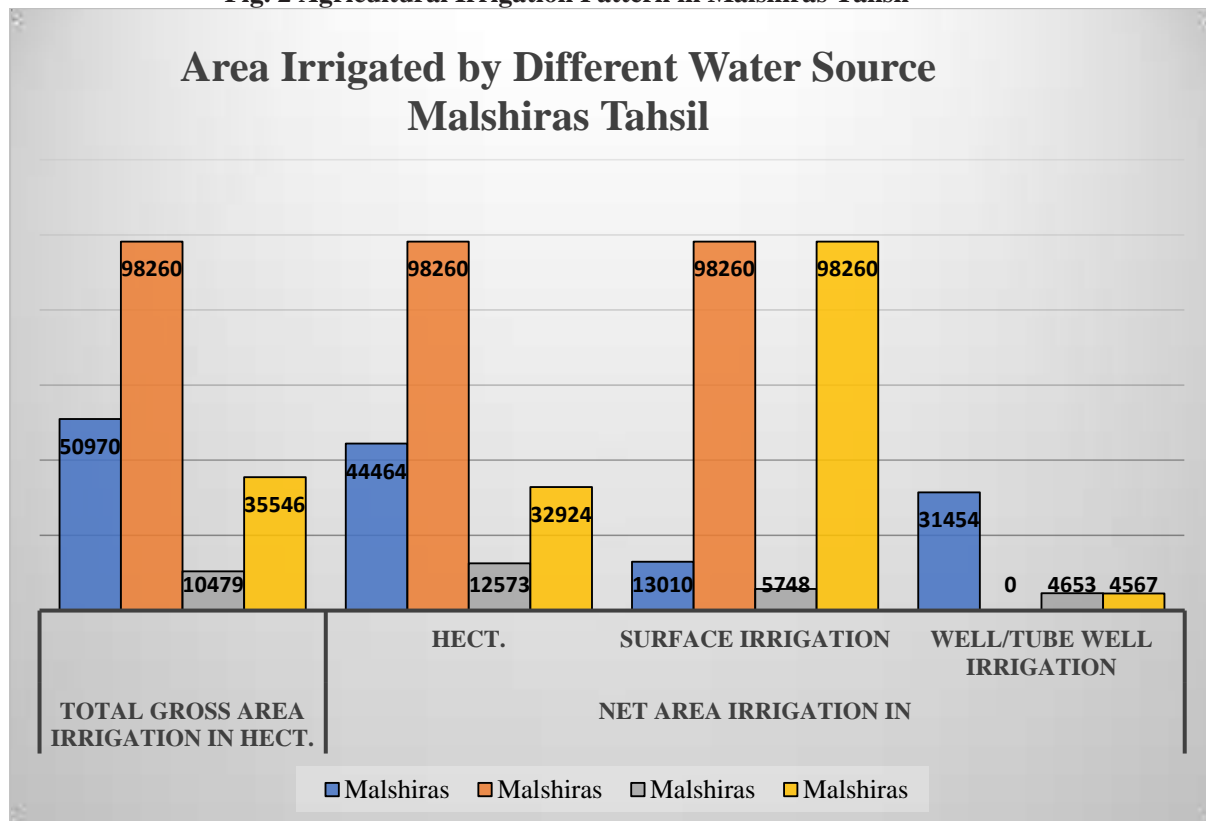
Irrigation intensity is the principal parameter for measuring agrarian pattern and position of development in a region. The term intensity of irrigation then refers to percent of net area rinsed to net area sown. This helps in determining the chance of agrarian area which still requires the development of irrigation installations. It also helps us in findings whether the available irrigation installations are sufficient or deficient to meet the irrigation demand of the agrarian area available on the base of available irrigation sources shops and systems can be made for the unborn development in increase in the being irrigated area. (Gurjar, 1990). The intensity of irrigation as a total is about 66.87 per cent which is further than Solapur quarter normal of 39 percent and state normal of 16 percent during the period of 2011. (Kamble., 2018) The circle position analysis reveals that the intensity of irrigation is characterized by its large scale areal variation, and they substantially related to environmental as well as socio-profitable condition during the period of 1991 and 2011. According to 1991, the spatial distribution of irrigation intensity is largely uneven throughout the Malshiras tahsil ranging from 25.95 per cent in Islampur circle to 86.53 per cent in Lawang circle. fairly high (above 75 per cent) intensity of irrigation is observed in the circles of Lawang and Akluj. This can be well attributed to vacuity of water in swash sources of Nira and canal irrigation. On the negative, low (below 50 per cent) intensity of irrigation is recorded in the circles of Islampur, Natepute, Dhaigaon, Piliv and Sadashivnagar. Some corridor of these circles undulating geomorphology and failure of water.

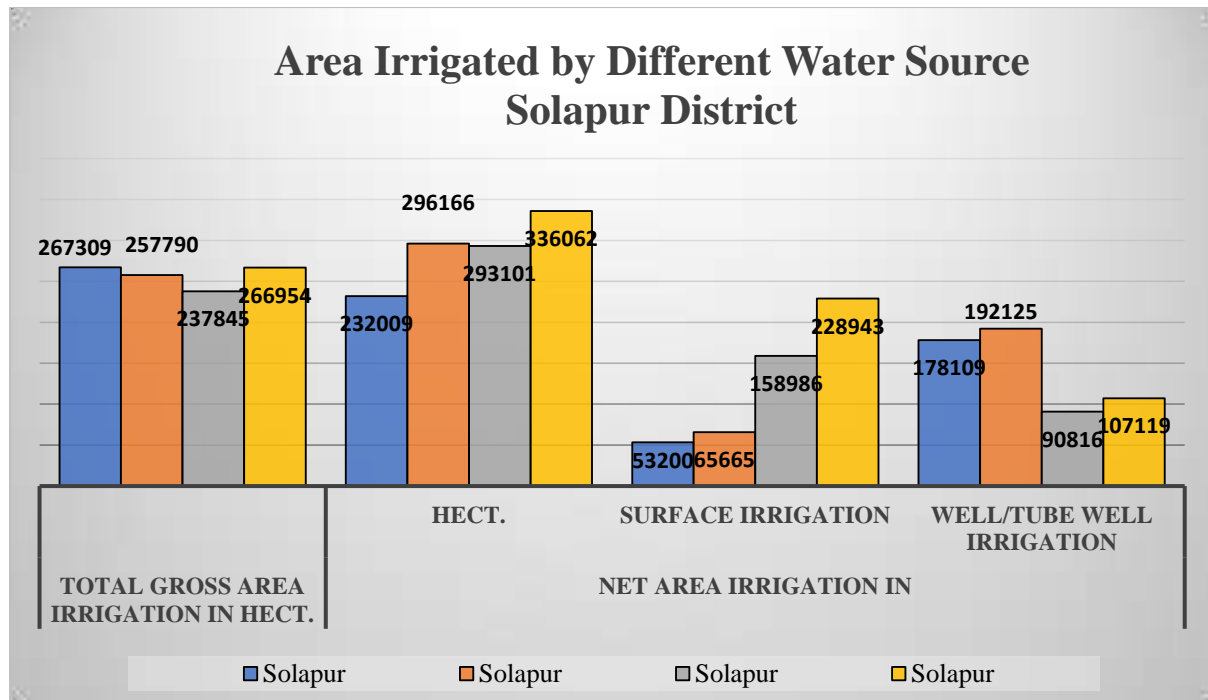
**Table 1: Area Irrigated by Different Water Source**

Area	Year	Total Gross Area Irrigation in hect.	Net Area Irrigation in hect.	Surface Irrigation	Well and Tube Irrigation
Malshiras tahsil	1990-91	50970	44464	13010	31454
	2000-01	98260	98260	98260	0
	2010-11	10479	12573	5748	4653
	2020-21	35546	32924	98260	4567
Solapur District	1990-91	267309	232009	53200	178109
	2000-01	257790	296166	65665	192125
	2010-11	237845	293101	158986	90816
	2020-21	266954	336062	228943	107119

(Source: -Socio-Economic Review Solapur district)

The table has shown irrigated area by surface and well irrigation in Solapur District and Malshiras tahsil. According to 1991 report total irrigated area was 267309 hectares in Solapur district. Where as in 2001, 2011 and 2021, it was 296166, 293101, and 336062 hect. respectively. The increase in the irrigation area was reported. The surface water irrigation has shown the contribution of 53200, 65665, 158986, and 228943 hect. respectively. The pattern almost uneven i.e., increase and decrease which was directly proportional with rain water availability in the region. In the study area surface water irrigation contributed between 158986 to 228943. This indicates the meteorological condition that monsoon availability and the pattern can influence the surface water and groundwater recharging. As the study area is rain shadow area mostly depend on retreating monsoon. With mostly having uneven pattern.

**Fig. 2 Agricultural Irrigation Pattern in Malshiras Tahsil****Fig. 3 Agricultural Irrigation Pattern in Solapur District**



**Irrigation and cropping pattern:**

In Solapur district, the northern area having surface irrigation whereas southern area of district mostly depends on groundwater irrigation practices. The irrigation water availability reflects the land use and cropping pattern in the district. In study area the short-term cropping pattern like wheat, jowar Bajara were dominating in compare to district scenario.

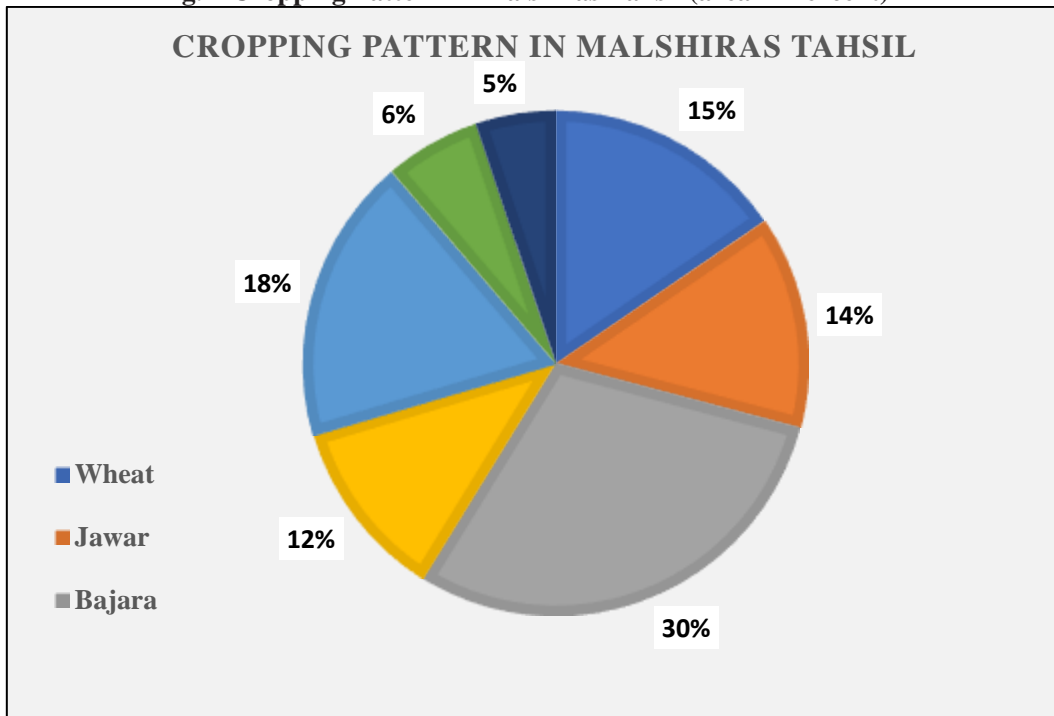
The land under the wheat cultivation were decreased by 31.81% to the 11.55% whereas in study area i.e. Malshiras tahsil it was 23.45% to 9.28% but after that decline, in Jawar and Bajara at district level land under cultivation declines from 30.71% to 29.16% and 20.75% to 11.52%, but in 2011 the area under Jawar and Bajra is decrease by 45.07% and 5.28%, whereas the cash crop like sugarcane, cultivation were leading in the district. Whereas in comparison with the study area in Malshiras tahsil the Maize cultivation were increase from 17.62%, 10.86% and 21.13% but in 2011 the area under jowar is increase rapidly by 66.22% because uncertainty of rain and lack of surface and ground water. Surprisingly cash crop like sugarcane cultivation increased from 27.83% to 31.03%. (2021) The cash crop cultivation practices were increased due to irrigation project (Ujjan canal project) available in study area attracting the farmers from indigenous to cash crop but in 2001 (7.13%) area under cash crop was decline because of rainfall variability and canal rotation interval has been increased. This indicates the surface water availability impacting on land use pattern and agricultural economy.

**Table 2: Cropping Pattern in Solapur District and Malshiras Tahsil (area in Percent)**

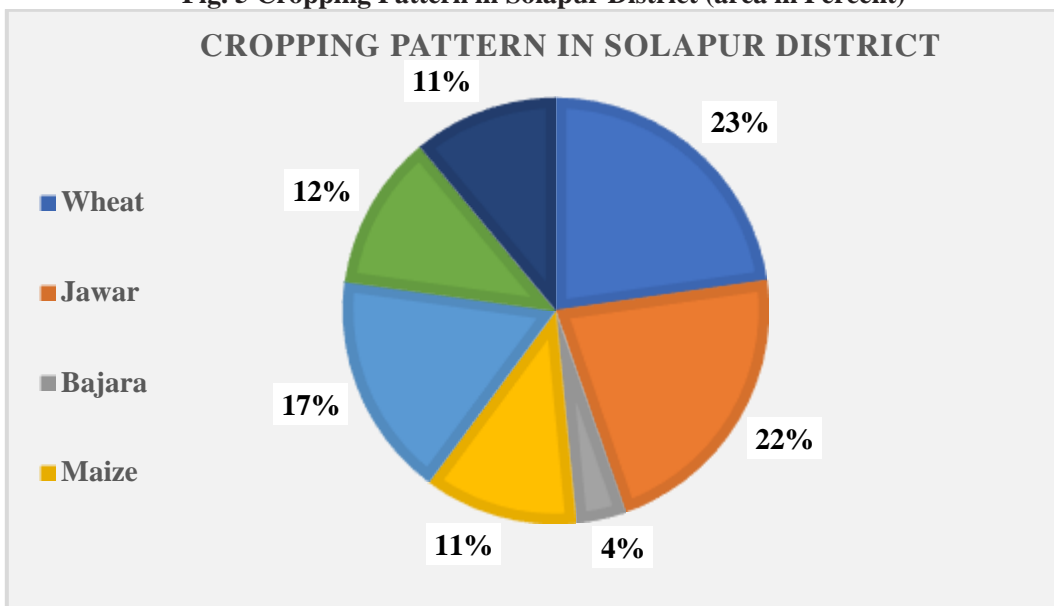
Area	Year	Wheat	Jawar	Bajara	Maize	Sugarcane	Total Vegetable	Oil Seeds
Malshiras tahsil	1990-91	23.45	20.75	45.07	17.62	27.83	9.30	7.78
	2000-01	10.67	17.80	12.36	10.86	7.13	14.26	2.52
	2010-11	8.32	12.03	18.02	34.87	17.60	01.9	4.70
	2020-21	9.28	11.52	15.94	21.13	31.03	1.70	0.52
Solapur District	1990-91	31.81	30.71	5.28	16.34	23.82	16.50	15.40
	2000-01	6.68	88.84	1.47	2.87	17.25	39.81	2.52
	2010-11	12.67	70.35	8.15	8.77	14.59	55.74	54.20
	2020-21	11.55	29.16	8.16	21.10	23.52	23.20	24.25

(Sources: Data Compiled by researcher)

**Fig. 4 Cropping Pattern in Malshiras Tahsil (area in Percent)**



**Fig. 5 Cropping Pattern in Solapur District (area in Percent)**



**Conclusion:**

In the current learn about the information expose the Landuse sample and the irrigation practices in the Malshiras tahsil, Solapur. The records from 1991 to 2021 of the irrigation practices displays the land use sample of a district. The southern phase of the district, by and large influenced via irrigation amenities (Ujjani dam) the minor irrigation initiatives additionally enhances the Landuse sample in assessment with the data, the district situation frequently dominated through money plants in the northern part. Whereas the find out about region which got here beneath rain shadow area, i.e. listing availability of monsoon. Which influences the irrigation amenities the current finds out about vicinity in no longer having any main irrigation mission the in part rely on Ujjani canal irrigation. The agriculture sample displays often the tube properly and dug nicely is a top supply for irrigation. The cropping sample in most cases displays the non-permanent plants like Jawar, Bajara, Wheat, groundnuts, however in 1991 to 2021 statistics displays the money crop existence in agriculture pattern, i.e. the availability of irrigation amenities expanded the farmer's pastimes closer to the such kind of

crop.

#### References:

1. Dattatrya G., Dr. J. More (2015) - Impact of Farm Ponds on Agriculture, *A Case Study of Parner Tehsil*, Peer Reviewed International Research Journal of Geography, Maharashtra Bhugolshastra Sanshodhan Patrika, Vol-32, Issue 2.
2. District Census Handbook (1991 to 2021).
3. Dr. Banduke D. K. & Santosh P. Mane (2019) "Rice Productivity in Satara District: A Geographical Analysis." Research Journey Impact Factor - (SJIF) – 6.261, (CIF) - 3.452(2015), (GIF)–0.676 (2013) Special Issue 144, Pp-159-165.
4. Dr. D. C. Kamble and Mr. Santosh P. Mane (2018) "A Study of Irrigation Intensity of Different Sources in Malshiras Tahsil." Research Journey, Research Journey, ISSN: 2348-7143 Impact Factor - (SJIF) – 6.261, (CIF) - 3.452(2015), (GIF)–0.676 (2013) Special Issue 144, Pp-28-36.
5. Dr. D. C. Kamble and Mr. Santosh P. Mane (2018) "Irrigation Pattern In Malshiras Tahsil Of Solapur District: A Geographical Analysis." Review of Research ISSN 2249-894X, impact factor: 5.2331 (UIF), Volume, Issue-9 Pp-74-77.
6. Dr. D. C. Kamble and Mr. Santosh P. Mane (2018), "Agriculture Productivity in Malshiras: A Geographical Analysis," Aayushi International Interdisciplinary Research Journal (ISSN 2349-638x) Impact Factor 4.574, Volume 2, Issue-9 Pp-658-662.
7. Dr. D. H. Bhojane, Santosh P. Mane (2020), "Satisfaction Of Irrigated And Non-Irrigated Farmers", Research Journey, Impact Factor - (SJIF) – 6.261, (CIF) - 3.452(2015), (GIF)–0.676 (2013) Special Issue 236(C), Pp-142-147
8. Dr. Dhanesh N. Ligade & Santosh P. Mane (2020), "Transformation of Food Crops Into Cash Crops: A Case Of Solapur District", Aayushi International Interdisciplinary Research Journal, ISSN 2349-638x Impact Factor 6.293, Special Issue No.80
9. Dr. Rajaram Patil & Santosh P. Mane (2020), "Geographical Analysis of Agricultural Land Use Pattern of Kankavli Tahsil", Research Journey Pp-50-54, ISSN 2348-7143
10. Gazetteer of Solapur District., (1991).
11. Mane Santosh P. (2020) "Impact of Irrigation on Agriculture in Malshiras Tahsil of Solapur District (Ms): A Geographical Analysis" unpublished M.Phil. Dissertation submitted to Shivaji University, Kolhapur.
12. Nilesh Kale, Jyotiram More: Morphometric Analysis of Upper Ghod Bhima Using GIS Techniques Impact Factor 2.243 Online International Research Journal Volume-IV, Issue- V, Sep-Oct 2014, PP-152-158 ISSN-2249-9598, <http://www.oijrj.org/oijrj/sept-oct 2 014/21.pdf>.
13. Santosh P mane and Somnath B. Gaikwad (2019) "Agriculture Productivity Calculate Based on MG Kendall's Method in Malshiras Tahsil." Research Journey, ISSN: 2348-7143 impact factor: 3.261 (SJIF), Issue-114, Pp-145-151.
14. Saptarshi P.G. (1993) "Resource appraisal and planning strategy for the Drought-prone areas, *A case study of the Karjat tahsil Dist- Ahmadnagar, Maharashtra*", Unpublished Ph.D. thesis submitted to University of Pune. 411007. P.p.232.
15. Solapur District Socio-Economic Statistical Review (2001, 2011, 2021)
16. Somnath B Gaikwad, Santosh P Mane & Dashrath K Banduke (2019) "Crop Combination Calculate on Weaver's Method in Malshiras Tahsil." Research Journey, ISSN: 2348-7143, Impact Factor- (SJIF) 6.261, Special Issue 144 (A) Pp-145-151