



## ASSESSMENT OF CROPPING PATTERN AND WATER RESOURCES UTILIZATION: A CASE STUDY OF SHRIGONDA TAHSIL, AHMEDNAGAR

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### **Abstract:**

*Irrigation has become an important aspect of agriculture. Recently irrigation has become more essential and without it most crops cannot be grown. It becomes essentially part due to variability of monsoon and uneven distribution of rainfall throughout the year. Even those crops, which grow during the rainy season, also depend upon irrigation because farmers try to irrigate the crops in time so that crops might be ready in time and give higher yields. In case of failure of rainfall use of irrigation becomes much more essential areas growing multiple crops need intensive irrigation facilities.*

*Therefore, present research work highlighted the cropping pattern and water resources utilization of Shrigonda tahsil. The study area lies under rain shadow and semiarid region in the Maharashtra. The irrigation water resource availability and management practices were seen from the study area in relation with a cropping pattern during 1961 to 2011. Mostly 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 surface water irrigation facilities.*

Keywords: Water Resources, Land use, Cropping Pattern, Irrigation Facilities.

### **Introduction:**

Irrigation has become an important aspect of agriculture. Recently, irrigation becomes most essential and without it most crops cannot be grown. It becomes essential part due to variation of rainfall monsoon and uneven distribution of rainfall throughout the year. Even those crops, which are grown during rainy season, also depend upon irrigation because farmers try to irrigate the crops in time so that crops might be ready in time and give higher yield (Spatarshi, 1993; Kadam, 2000; Bhagat, 2002; Jyotiram More, 2016, Nilesh Kale & Jyotiram More). In case of failure of rainfall use of irrigation becomes much more essential areas growing multiple crops need intensive irrigation facilities. Although, the modernization in the irrigation practices cannot abide the rainwater availability. Rainwater is considered as base of irrigation. Inadequate rainfall disturbs the ground water availability in the resources and rivers, canals, get dry and farmers became replace the importance of rainwater. Irregularities in monsoon pattern in space and time, makes the artificial irrigation practices are essential for most of the crops cultivated in the region. Where as sugar cane, groundnuts etc are totally depend on artificial irrigation.

The surface water irrigation practices like the tank, river, canal, and lake play vital role in irrigation. The underground water is also being tapped by dug and tube wells and these became important due to support.

### **Study Area:**

The Shrigonda tahsil is located in the southern drought prone zone of Ahmednagar district. The tahsil situated partly Bhima, Ghod and Kuakdi River and canal basin. In the tahsil length of 60 Km. from East to West and 51 Km. from North to South. The height of tahsil is recorded 600 Mtr. Above the sea level. Generally slope of tahsil is North to South.

The latitudinal extend is 180 27' 18" to 180 51' 54" North and longitudinal extend is 740 23' 24" to 740 52' East. It is surrounded by Parner and Nagar tahsil to the northern part, Pune district to the west and south - east Karjat tahsil. It's an area of 1630 Sq. Km. is the third rank of tahsil in Ahmednagar district. It is historical and religious which is situated on the bank of river Saraswati.

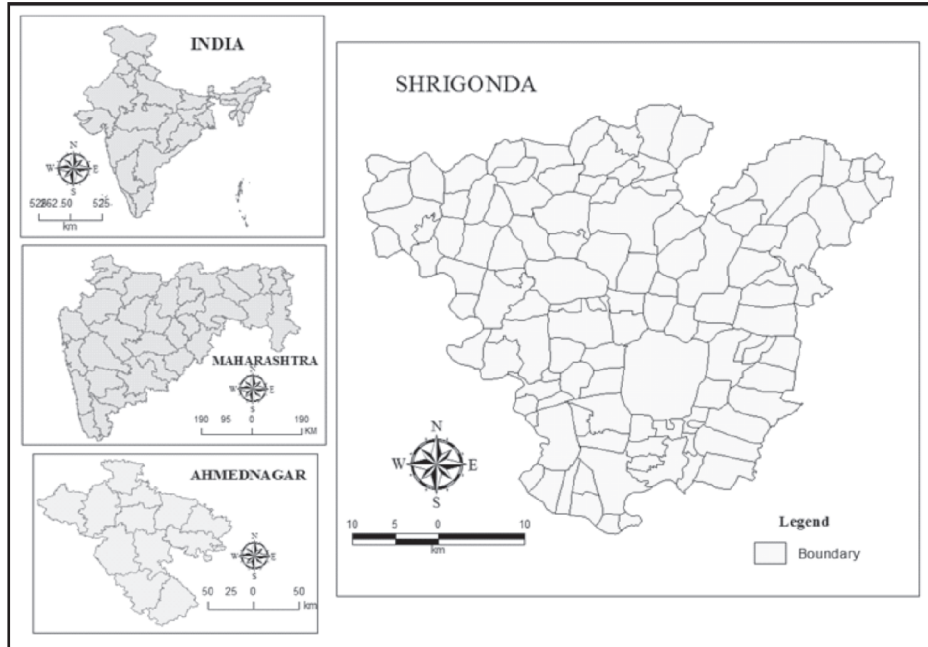


Fig.1 Location Map of Study Area

**Objective:**

**The main objective of the present study is:**

- 1) To assess the cropping pattern and water resources utilization of the study area with reference to Ahmednagar District.

**Database and Methodology:**

The present paper is primarily based on secondary data. The data on census year have been collected. Considering a village as a unit for the shrigonda tahsil in Ahmednagar district of Maharashtra, the data have been collected from village Panchyat Samiti, Tahsil office Shrigonda, Department of irrigation, socio-economic review book, and statistical abstract of Ahmednagar district. The data pertaining to the period from 1960-61 to 2010-11

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.

The present scenario of irrigation practices then shrigonda tahsil that is study area compared with the district irrigation status. The main irrigation practices in the study area of well water and surface water were observed since 1961-2011. The table 01 reveals the data in relation to the land under irrigation and practices. In 1961 the gross area available for agricultural practices, were 154472 hect. were as 135824 hectors were actual under the irrigation. In respective the surface irrigation practices contribute 34.14 % were as well irrigation 65.86%, consequent the 1970-71 the surface and

well water irrigation practices were 29.30% and 70.70% respectively, were as in 1980-81 the surface water irrigation a practice decline (29.30%) and increases the burden on ground water (71.50%). But in 1990-91 enhances the 5% in irrigation by surface water affability and reduces the dependency on ground water. Again in 2001 and 2011 rain water availability decline showing the impact on surface water availability for irrigation and parasite on ground water for farming practices.

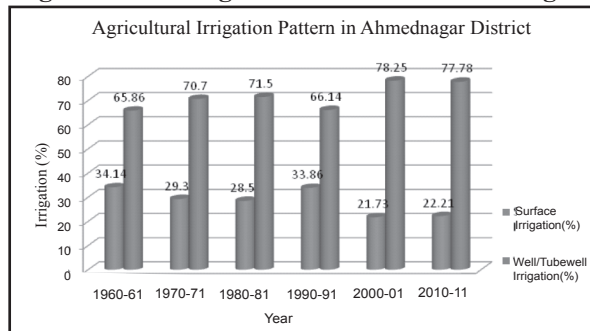
**Table 1: Area irrigated by different water source**

Area	Year	Total Gross Area Irrigation in hect.	Net Area Irrigation in hect.	surface Irrigation(%)	Well/Tubewell Irrigation(%)
Ahmednagar Dist.	1960-61	154472	135824	34.14	65.86
	1970-71	174209	147030	29.3	70.7
	1980-81	287289	243772	28.5	71.5
	1990-91	311178	246391	33.86	66.14
	2000-01	382807	321663	21.73	78.25
	2010-11	1326156	431626	22.21	77.78
Shrigonda Tahsil	1960-61	14212	12216	25.25	74.75
	1970-71	16159	13878	48.19	51.81
	1980-81	21101	20756	35.16	64.84
	1990-91	31851	25379	39.07	60.93
	2000-01	60061	36575	27	73
	2010-11	113870	36615	19.32	80.67

(Source:-Socio-Economic Review Ahmednagar district)

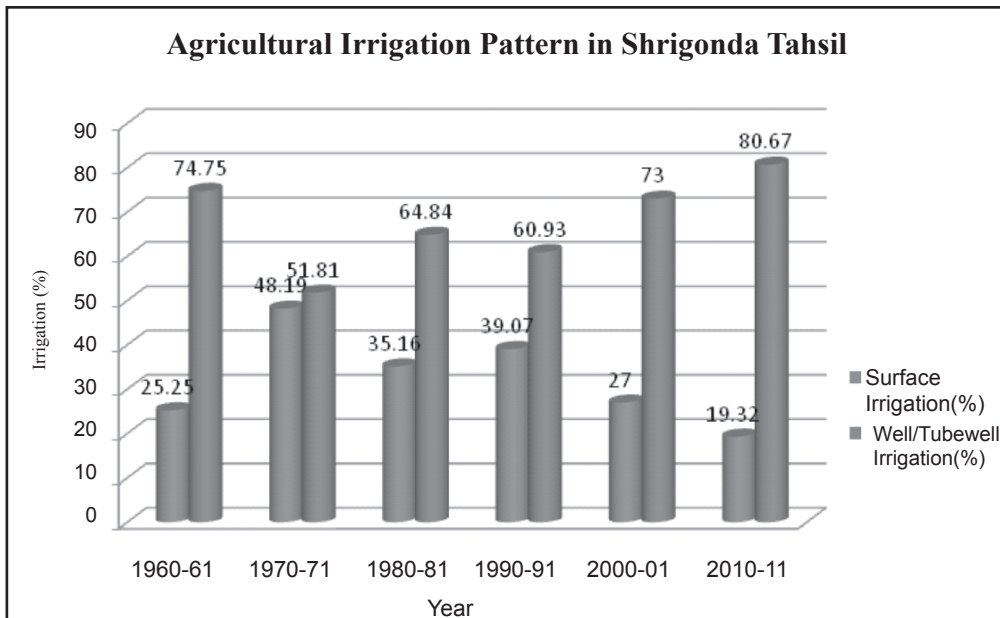
The table has shown irrigated area by surface and well irrigation in Ahmednagar district and Shrigonda tahsil. According to 1961 report total irrigated area was 154472 hectares in Ahmednagar district. Whereas on 1971, 1991, 2001 and 2011, it was 174029, 287289, 311178, 382807 and 1326156 hect. respectively.(Figure 01). The increase in the irrigation area was reported. The surface water irrigation has shown the contribution of 34.17% 29.30% 28.50%, 33.86%, 21.73% and 22.71% respectively. The pattern almost uneven i.e. increase and decrease which was directly proportional with rainwater availability in the region. In the study area surface water irrigation contributed between 19.32% to 48.19%. Mainly the irrigation practices were on tube well and dug well i.e. up to 80%. This indicates the meteorological condition that monsoon availability and the pattern can influence the surface water and ground water recharging. As the study area is rain shadow area mostly depend on retreating monsoon. With mostly having uneven pattern. (Ref. Gazetteers)

**Fig. 2 Agricultural Irrigation Pattern in Ahmednagar District**



(Source:-Socio-Economic Review Ahmednagar district)

**Fig.3Agricultural Irrigation Pattern in Shrigonda Tahsil**



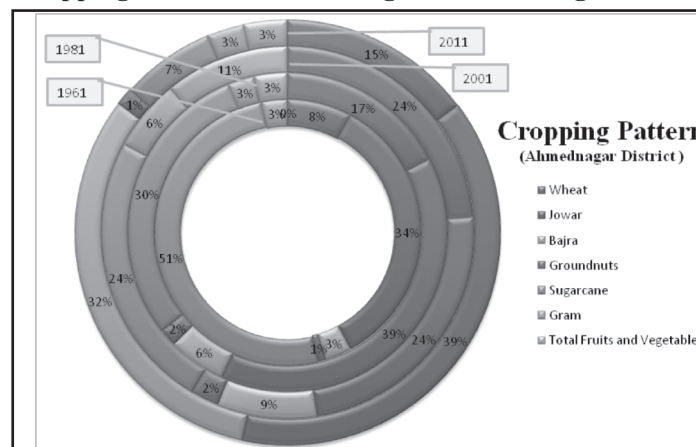
(Source:-Socio-Economic Review Ahmednagar district)

**Irrigation and cropping pattern :**

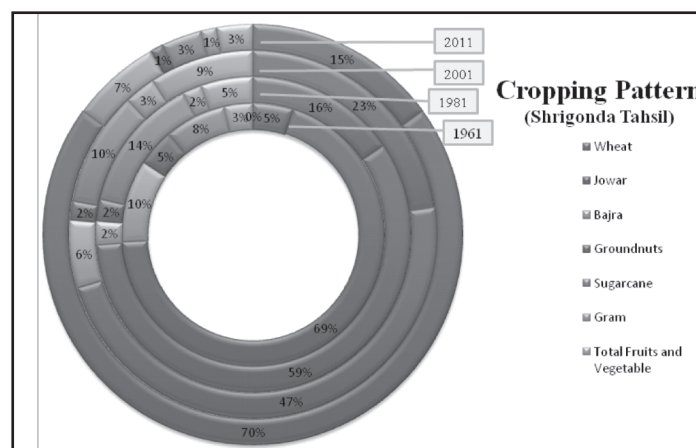
In Ahmednagar district, the northern area having surface irrigation where as southern area of district mostly depend on ground water irrigation practices. The irrigation water availability reflects the land use and cropping pattern in the district. In study area the short term cropping pattern likewheat, jowar bajara were dominating in compare to district scenario. The land under the wheat cultivation were increased by 7.86% to the 23.69% were as in study area i.e. shrigionda tahsil it was 4.93% to 22.65% but after that decline, in jowar and bajara at district level land under cultivation declines from 34.27% to 23.74% and 3.28% to 8.7% (upto 2001) but in 2011 the area under jowar and bajra is increase by 33.15 and 27.31, where as the cash crop like sugarcane, cultivation were dominating in the district. Where as in comparison with the study area in shrigionda tahsil the jowar and bajara cultivation were decline from 69.22% to 47.63% and 10.10% to 5.9%(upto 2001) 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 form 7.63% to 10.10 %.(2001) The cash crop cultivation practices were increased due to irrigation project (kukadi canal project) available in study area attracting the farmers from indigenes to cash crop but in 2011(2.94%) area under cash crop was decline because of rainfall variability andcanal rotation interval has been increased. This indicates the surface water availability impacting on land use pattern and agricultural economy. (fig. 2)

Area	Year	Wheat	Jowar	Bajra	Groundnuts	Sugarcane	Gram	Total Fruits and Vegetable
Ahmednagar Dist.	1961	7.86	34.27	3.28	0.89	50.53	3.17	NA
	1981	17.38	39.42	5.84	1.82	29.46	2.69	3.39
	2001	23.69	23.74	8.71	2.49	24.25	6.24	10.88
	2011	12.65	33.15	27.31	1.17	6.11	2.42	2.83
Shrigonda Tahsil	1961	4.93	69.22	10.1	4.58	7.63	3.54	NA
	1981	15.49	58.45	2.42	2.27	14.04	1.95	5.37
	2001	22.65	47.63	5.95	1.68	10.1	2.76	9.23
	2011	14.17	66.22	6.48	0.95	2.94	1.15	2.65

Table 2: Cropping Pattern In Ahmednagar Dist. & Shrigonda Tahsil (In %)



(Source:-Socio-Economic Review Ahmednagar district)  
**Fig. 4 Agricultural Cropping Pattern in Ahmednagar District**



**Fig. 5 Agricultural Cropping Pattern in Shrigonda Tahsil**

**Conclusion:**

In the present study the data reveal the landuse pattern and the irrigation practices in the Shrigonda tahsil, Ahmednagar. The data from 1961 to 2011 of the irrigation practices reflects the land use pattern of a district. The southern part of the district, mostly influenced by irrigation facilities (Mula dam and Bhandardara dam) the minor irrigation projects also enhances the landuse pattern in comparison with the data, the district scenario mostly dominated by cash crops in the northern part. Whereas the study area which came under rain shadow area, i.e. less availability of monsoon. Which influences the irrigation facilities the present study area is not having any major irrigation project the partially depend on Kukadi and Ghod canal irrigation. The agriculture pattern reflects mostly the tube well and dug well is a prime source for irrigation. The cropping pattern mostly reflects the short term crops like jowar, bajara, wheat, groundnuts and gram. But in 1961 to 2001 data reflects the cash crop existence in agriculture pattern, i.e. the availability of irrigation facilities increased the farmer's interests towards the such type of crop.

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