

# Available of Physical and Environmental Conditions Effect on Rice Crop: A Case Study of Akole Tahsil (M.S, India)

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**Abstract:** The western part of the study area in Ahmednagar district is endowed with great natural scenery. In order to develop the potential of this area consisting of Bhandardara dam, Kalsubai, Ghatghar, Ratangarh and Harishchandra Garh etc. The environment development corporation sanctioned Rs.15 corers. In this area has great tourism potential as it has unique diversification in cultural as well as geographical variations and this will differently attract tourists visiting this area. Till today, in the field of development in this area, none of the geographers has done any research work e.g. cultural, historical, geographical, environmental, tourism, botany and zoology, economical etc. These areas have great tourism potential; it has a unique diversification in cultural as well as geographical variations and this will differently attractive culture and way of life. It is mountainous region with full of natural beauty, wild animals and birds as well as waterfalls. The local area is associated with Adivasi tribal people (ST) such as Thakar, Warli, Katkari, Mahadev-koli etc. and their life style is different from the non-tribal people. About 80 percent population depends directly upon land middle and eastern part of the Akole tahsil, state of Maharashtra, India, is mainly use of the agricultural land and converted into residential and other uses for the growth and development of the facilities. Farmers have adopt modern technology i.e. fruits and vegetables drip irrigation facility, variety seeds material, increasing use by composting biomass, improved planting technology and micro irrigation systems, crop loans, good network of transports and markets, agricultural advisory centers and also available facilities in the study area. Therefore, recently cropping pattern is change and day by day positive increased but eastern part of the study area is concentrate in the rice crop because of these areas situated in the hilly and heavy rainfall.

**Keywords:** Hilly Region, Physical & Environmental Conditions, Tribal Area, Cropping Pattern and Rice Crop

## Objectives:

1. To study physical and environmental Conditions.
2. To study changes in Rice crop.
3. Comparison of 1990-91 to 2000-01 and 2000-01 to 2010-11 changes in Rice crop.

## 1. Introduction

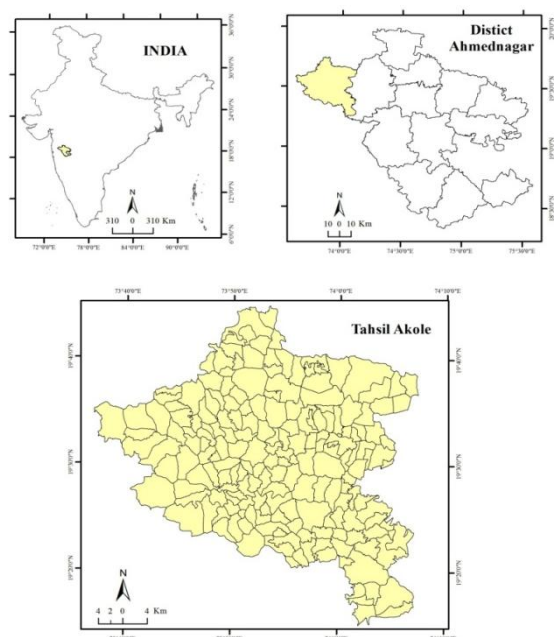
Akole Tahsil is located at western part of Ahmednagar District, in the state of Maharashtra. It is well surrounded with the mountainous of Sahyadries. Pravara, Mula, Adhala and Mahalungi are important rivers, rises in different places of study area. Tahsil is also covered by co-operative sugar factory, dairy milk, rice mills, banks and various co-operatives thrive here. The economy of the tahsil is driven mainly by agriculture of sugarcane, rice, horticulture, floriculture and various major cash crop of the study area. In the hilly region, climate is slightly cool. Wilson reservoir (Bhandardara), Nilwande reservoir and Adhala reservoir are the major surface water bodies and a large number of Small tanks or reservoirs have been delineated most of which are minor irrigation projects or pecculation tanks available. Separating grains of rice from husk by pounding and gathering medicinal plants are the small scale industries in study area.

## 2. Study Area

The study area Akole is a Tahsil place in Ahmednagar district, state of Maharashtra in India. Well surrounded with the mountains of Sahyadri, extends between 19° 15' 14" and 19° 44' 59" North Latitude and 73° 37' 00" to 74° 07' 24" East Longitudes, covering an area of 1, 50,508 hector (Map

no.1). The Highest Peak of Kalsubai (5427 feet or 1646 mt's) in the Sahyadris with a mean annual rainfall of about 508.9 mm. lies in the study area.

### LOCATION MAP



Map No. 1

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Area under forest in 41,698 hectares and agriculture land 98,712 hectares. Total Villages 191 and 4 (Four) **Revenue Circles** namely **Rajur, Akole, Samsherpur and Kotul**. Total population is 2, 91,950 Census 2011 (No. of Male 1, 47,880 and No. of Female 1, 44,070), literacy 1, 92,461 persons and one of which 1, 39,730 (ST) Tribal people in this area. The climate of the tahsil is hot and dry. It is characterized by a hot summer and general dryness except during the south-west monsoon season in India.

### 3. Data and Methodology

Rice crop of study area was prepared with the help of Arc GIS 10.1, Arc View 3.32 and RS analysis Ilwis 3.3 software packages thematic maps related to study area was prepared by using Survey of India Toposheet of 1: 50000 scale as the raster maps.

### 4. Discussion

#### 4.1 Distribution of Principal Crops

Distribution of irrigated land among different crops in Table no.1, 2 and fig. no.1 is shown: Total Rice Crops (Kharip), Bajra (Kharip), Wheat (Rabbi), Other Cereals (Jawar and Maize), Total Pulses, Soya been (Kharip), Other Oilseeds, Cotton (Kharip), Sugarcane, Total Fruit Crops, Total Vegetable Crops, Total Flower Crops, Total Fodder Crops are important crops grown with the help of ground water. It is observed that rice is the leading crops as is grown irrigated land. The next important crop is sugarcane another cereals, vegetable, fruit crops etc. grown by the irrigated land. It is quite interesting to note that almost all the farmers used high yielding varieties seeds of cereals and pulses.

#### 4.2 Village wise area of major crops:

Various kinds of following crops are cultivated in the tahsil. The total actual cropped area is **72768** hectares during 2010-11.

**Table 1**

Sr. No.	Total Crops	Area in %
1	Rice Crops	21.88
2	Bajra	14.63
3	Wheat	8.63
4	Other Cereals	5.74
5	Total Pulses	5.04
6	Soya been	6.33

7	Other Oilseeds	3.05
8	Cotton	4.11
9	Sugarcane	2.57
10	Total Fruit Crops	1.69
11	Total Vegetable Crops	15.50
12	Total Flower Crops	8.95
13	Total Fodder Crops	1.82
<b>Total</b>		<b>100</b>

(Source: Agriculture Dept. Akole Tahsil)

Table and fig no.1 shows that rice is the dominant crop in the tahsil. It is cultivated in 15925 hectares of land, which accounts for 21.88% of gross cropped area. Vegetable is the next crop which is cultivated in 11283 hectares recurring 15.50 % of total cropped area. While the bajra, flower crops, wheat, soya been, pulses, jawar and maize, cotton, oilseeds, sugarcane, fodder crops and fruit crops are 14.63, 8.95, 8.63, 6.33, 5.04, 5.74, 4.11, 3.05, 2.57, 1.82 and 1.69 % of the total area under different crops that varies in different villages.

#### 4.3 Rice: (Oryza Sativa)

Rice is the most important food grain of India. It is the staple food of the country where rainfall exceeds 100 cm. India ranks second in the production of rice, after china. A climatic condition of rice is a crop of the tropical monsoon lamed. It requires hot and humid climate its 16 °c to 20 °c temperature. Rice requires flooded fields on hills and mountains, rice is grown on terraces. Rice grows on a wide variety of soils. The rice cultivation requires cheap and abundant labour, as most of the works in rice fields. Such as sowing, transplanting and harvesting are done by hand.

The distributional pattern of rice crop cultivation in the study region (Rice varieties: Tulasi, prasanna, heera, kranti, aditya, darna, suvarna, surekha, mahamaya, dharana, kasturi, pusa-basmati, radhanagari 185, halwa (1974), indrayani (1987), kundlika and pawana (1988), phule-maval (1998), bhogawati and phule-radha (2004), phule-samruddhi (2007), sughandha, prabhavati, hmt-sona, phule-makarand etc.) is influenced by soil, climate and receiving high rainfall. Rice cultivation are grown a 95.85% in 1990-91, 93.23% in 2000-01 and 99.69% in 2010-11. The highest area under rice was recorded in rajur circle 48.02% in 1990-91, 47.11% in 2000-01 and 45.63% in 2010-11 (Table and Fig. no.1 and Map no.2)

#### 4.3.1 Spatial Distribution of Rice (1991 to 2011)

**Table 2**

Sr. No	Name of Circle	Year (Area in %)			Volume of change	
		1990-91	2000-01	2010-11	1991 to 2001	2001 to 2011
1	Akole	4.05	3.78	3.00	- 0.27	- 0.78
2	Kotul	24.09	24.73	23.73	+ 0.64	- 1.00
3	Rajur	48.02	47.11	45.63	- 0.91	- 1.48
4	Samsherpur	18.69	17.61	27.33	- 1.08	+ 9.72
	<b>Total</b>	<b>94.85</b>	<b>93.23</b>	<b>99.69</b>	<b>- 1.62</b>	<b>+ 6.46</b>

(Source: Agriculture Dept. Akole Tahsil)

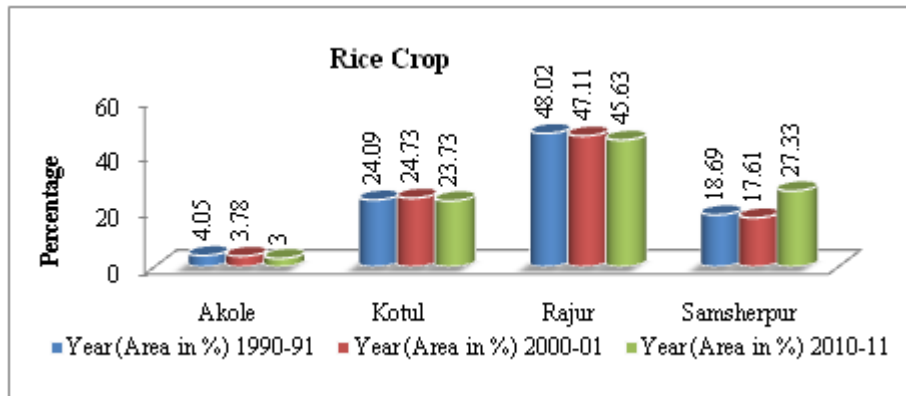
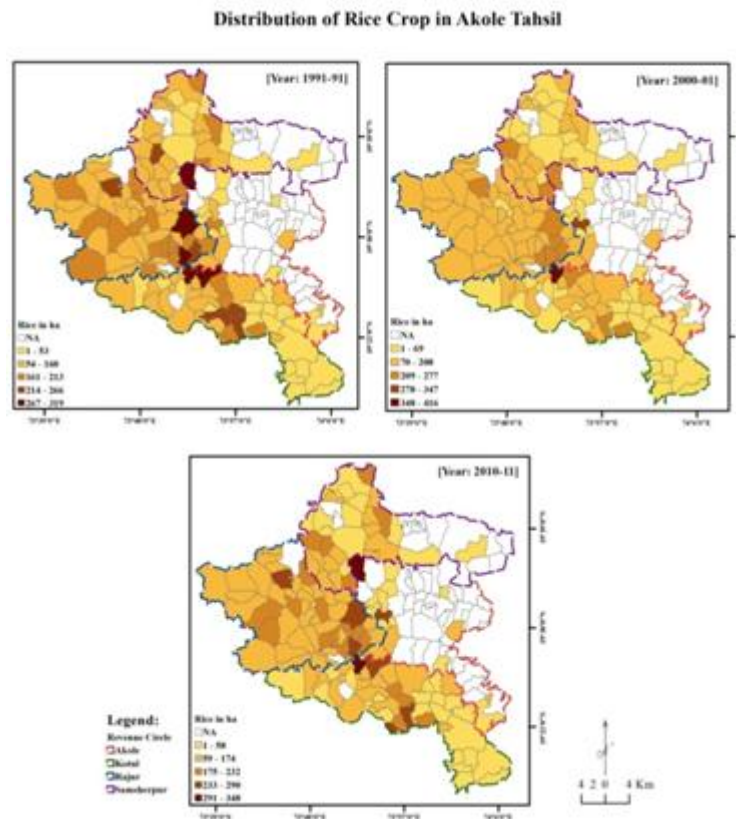


Figure 1



Map No. 2

In the study area has recorded highest area under rice cultivation have rajur circle. Because of these area is mostly received high rainfall, uncertain topography or steep hill ranges and low cost labours are available. Akole circles have found less than 10%, rice area, Kotul and Samsherpur circles have found more than 10% rice area. (Table no.2, Fig. no 1 and Map no.2)

## 5. Conclusions

The major crops cultivated in kharip season and rabbi season are grown in the study area. It is observed from the study area, there is a grater variation in the changes land use and cropping pattern, during the study period i.e. 1991 to 2011. According to census 1991 Total cover Rice crop Area Was 94.85% out of which Akole circle were 4.05%, kotul 24.09%, Rajur 48.02% and Samsherpur circle was 18.69 %. Whereas in 2011 Total area under rice crop is 99.69% out of which Akole circle 3%, kotul 23.73%, Rajur 45.63%

and Samsherpur circle are 27.33 %.The area under rice cultivation in the tah. is 22.61% in 1991, 22.04% in 2001 and 21.88% in 11. The highest area under rice was recorded in Rajur circle i.e. 48.02% in 1991, 47.11% in 2001 and 45.63% in 2011. Because of these areas is mostly received high rainfall having uncertain topography and availability of low-cost labours. Akole circles have less than 10% rice area. Whereas Kotul and Samsherpur circles have more than 10% rice area. Rice Varieties: Tulasi, Prasanna, Heera, Kranti, Aditya, Darna, Suvarna, Surekha, Mahamaya, Dharana, Kasturi, Pusa-Basmati, Radhanagari, Halwa, Indrayani, Kundlika and Pawana, Phule-Maval, Bhogawati, Phule-Radha, Phule-Samruddhi Sughandha, Prabhavati, Hmt-Sona, Phule-Makarand etc. The total area under cultivation has been considered for analysis. After analyzing, it is observed that Rice is the dominant crop in this tah. Only one crop cultivation is taking place in the western hilly region i.e. rice cultivation.

In this region after harvesting of rice, if cultivation of other crops like, cashew nut, jack fruit, custard apple takes place, people can enjoy economical stability. In the western part of tah., the amount of rainfall is averagely 508.9 mm. Due to the steep slope and mountains topography to the west, the rainwater is flowing faster. If this flowing water will get turn to the east, this rain water can be utilized for agriculture and various uses. Adapting agricultural policies and practices according to changing climate condition. Immediate measures are needed to be taken to restore the water, conservation of forest resources and agricultural lands also. Otherwise the tah. may face issues like food insecurities and famines in future.

In the study area farmers have adopt modern technology i.e. fruits and vegetables drip irrigation facility, variety seeds material, sugarcane, fruits, vegetables, food grain and other crops increasing use by composting biomass, machineries, improved planting technology and micro irrigation systems, available for nearby village inputs, agricultural labour, bullock power, crop loans, electricity, irrigation, dairy centers and processing units, nearby sugar factory, good network of transports and markets, good communication facilities, agricultural advisory centers and also available facilities in the study area. Therefore, recently agricultural landuse and cropping pattern is day by day positive increased in the study area. Although the entire cropping pattern seems to be governed by agro-climatic conditions, irrigation has played a prominent role by changing the nature and extent of cropping pattern. Rice and fodder cultivation prevail in western heavy rainfall zone. The southern, middle and eastern part, facilitated by assured irrigation and fertile soils are suitable for growing several crops.

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