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The Study Of Per Hector Yield Of Sugarcane In Drought-Prone Area Of Solapur District (M.S.)

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Abstract

The study investigates the per hectare yield of sugarcane in the drought-prone Solapur district of Maharashtra, focusing on spatio-temporal changes between 1991–96 and 2006–11. Agriculture in this region is heavily dependent on monsoon rainfall, which is irregular, uncertain, and inadequate, often resulting in frequent crop failures. Sugarcane, being a water-intensive crop, poses significant challenges in such an environment, making irrigation development, particularly drip irrigation, crucial for sustainability. The findings reveal that while the district's overall average yield increased from 71.57 M.T. in 1991–96 to 86.28 M.T. in 2006–11, there were sharp intra-district variations. Tahsils like Mohol, Pandharpur, Malshiras, and Sangola showed significant growth due to better irrigation infrastructure, adoption of high-yielding varieties, and proximity to sugar industries, while Barshi experienced a decline (-1.16 M.T.) owing to poor irrigation development and soil limitations. The results highlight the critical role of irrigation technology, government support, and farmers' adoption of modern agricultural practices in improving yields. This study underscores the importance of sustainable irrigation strategies in drought-prone regions for ensuring crop productivity and regional agricultural development.

Keywords: - Sugarcane yield, Solapur district, drought-prone agriculture, irrigation

Introduction:

Geography is concerned to provide accurate, orderly and rational description and interpretation of the variable character of the earth's surface. Agriculture geography is one of the important branche of geography. Agriculture geography has been defined as the study of spatial variation in agriculture activity, involving both the description of such variations and attempts to explain them (Johnston 1985). Agriculture has been and will continue to be the life line of Indian economy. Directly and indirectly around two-third of Indian population is involved in agriculture activities. In Maharashtra state 65 per cent of the total workers depend on agriculture and allied activity.

Agriculture productivity is a function of interplay of physical (Physiography, Climate, Soil, Water) and cultural variables (Socio-Economic, Political, Institutional and Organizational) and it manifests itself through per hectare productivity and the total production. Agricultural productivity also depends on attitudes to the farmers towards work and their aspirations for better standard of living. Irrigation plays an important role in Indian agriculture due to uncertain, unreliable, irregular, variable, seasonal and unevenly distribution of rainfall. Irrigation is imperative for successful agriculture particularly in the arid, semi-arid and sub humid areas, which are prone to drought and famine conditions due to partial failure and delayed arrival or early withdrawal of Monsoon (Reddy & Reddy, 1992). Apart from that, there are certain crops such as Rice, Sugarcane, Jute, Cotton, etc. which require more water and have to be provide with irrigation even in area of heavy rainfall. In the present-day drip irrigation is most essential technological factor due to shortage of water resources. Drip method of irrigation helps to reduce the over-exploitation of groundwater that partly occurs because of inefficient use of water under surface method of irrigation. Environmental problems associated with the surface method of irrigation like water logging and salinity are also completely absent under drip method of irrigation (Narayanamoorthy, 1997). Drip method helps in achieving saving in irrigation water, increased water-use efficiency, decreased tillage requirement, higher quality products, increased crop yields and higher fertilizer-use efficiency.

In the study area the rainfall is irregular, uncertain and variation in annual rainfall from year to year is fairly large. Here agriculture is depended only on monsoon. If rainfall is scare it results into crop failure. To increase the total production and per hectare yield of sugarcane, it is necessary to increase the area under irrigation. At the same time, it is necessary to increase the area under drip irrigation in drought-affected areas like Solapur. Therefore,

attempt is made here to examine the "The study of per hector yield of sugarcane in drought-prone area of Solapur district (M.S.).

Study Region:

For the present investigation Solapur district is selected as a study region. Geographically Solapur district is located between $17^0$10' North to $18^0$32' North latitude and $74^0$42' East to $76^0$15' East longitude. It covers an area of 14,895 sq. km. The district is situated on the south eastern fringes of the state of Maharashtra and the district is bounded on the north by the Ahmednagar district and Osmanabad district, on the east by Osmanabad and Gulbarga district of the state of Karnataka, on the south by Sangli and Bijapur district and on the west by Pune and Satara district.

The shape of district resembles flying eagle. The proportion of area of Solapur district as compare to Maharashtra is about five (5%) per cent. It is administratively sub-divided into 11 tahsils. The soils of the district can be classified into three main types. These are black soil, coarse grey soil and reddish soil. Agro-climatically, the entire district comes under the rain shadow area. Rainfall is uncertain and scanty. The average rainfall for the district is 545.4 mm.

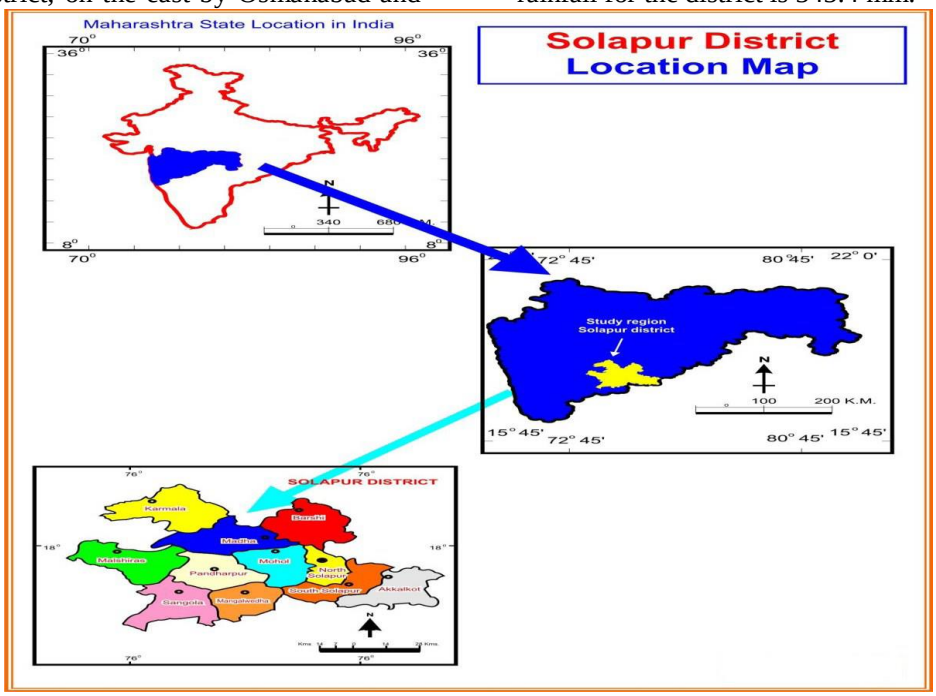

Fig.no.01

Objectives:

The main objectives of this paper are as following

1) To study the per hectare yield of sugarcane in Solapur district.
2) To study the factor responsible for increasing per hector yield of sugarcane in study region.

Date Collection & Methodology:

The study was conducted in the Solapur district in Maharashtra state. For the purpose of the study, only secondary information was collected from different sources. The secondary data per hector yield and geographical information of Solapur district was collected through Agriculture Department and Socio-Economic review and district Statistical abstract of Solapur District from the year 1991-96 and 2006 -11 used.

Result and Discussion:

Sugarcane is one of the significant crop cultivated predominantly in different tahsil of the study region. It is water-intensive crops. Despite being a water-intensive crop, type and fertility of soil, variety of seeds, sources and methods of irrigation and contribution of farmers are play important role in per hectare yield and production of sugarcane. The area under sugarcane crop continually grows in study region. (Dr. Nangare M.R. 2021) The table no. 1 shows that per hectare yield of sugarcane in Solapur district during the period of 1991-96 and 2006-11

Table No. 4.1

Per Hectare Yield of Sugarcane in Solapur District 1991-96 & 2006-11)

Sr. No.	Tahsil	Per Hectare Yield (in M.T.)		
		1991-96	2006-11	Changes
01	North Solapur	68.48	78.34	9.86
02	Barshi	62.92	61.76	-1.16

03	Akkalkot	62.28	81.5	19.22
04	South Solapur	67.18	85.12	17.94
05	Mohol	84.06	97.6	13.54
06	Mangalwedha	78.52	83.34	4.82
07	Pandharpur	82.86	98.6	15.74
08	Sangola	66.36	99.48	33.12
09	Malshiras	82.42	98.12	15.7
10	Karmala	70.66	94.47	23.81
11	Madha	61.64	73.24	11.6
12	District	71.57	86.28	9.86

Source: 1) Complied by Researcher. 2) Socio economic Abstract of Solapur district 1991-96 and 2006-11. 3) Chief statistical officer of the commissioner of Agriculture, Maharashtra State Pune.

During the 1991-96, there is 71.57 M.T. per hectare yield of Sugarcane in the Solapur district. The tahsil Mohol has highest per hectare yield of Sugarcane (84.06 M.T.) in Solapur district, where as lowest observed in Madha tahsil, which was 61.64 M.T. The table no. 1 and fig no. 2 reveals that the spatial distribution is very uneven. The high per hectare yield of Sugarcane is observed in Pandharpur, Malshiras and Mohol tahsil i.e. above 80 M.T. Because of Sugar Industry development in this region, development of irrigation facility, the use of high yielding variety of Sugarcane and fertile soil is available in Bhima River basin. The moderate level per hectare yield of Sugarcane is found only in Mangalwedha tahsil. It was between 75 to 80 M.T. per hectare yield of Sugarcane, whereas it is low in Karmala, Barshi, Sangola, Madha, Akkalkot, South Solapur and North Solapur tahsil i.e. below 75 M.T. per hectare yield of Sugarcane. It was due to poor development of irrigation facility, lack of sugar industry development and those tahsil are Jawar production tahsils of study region.

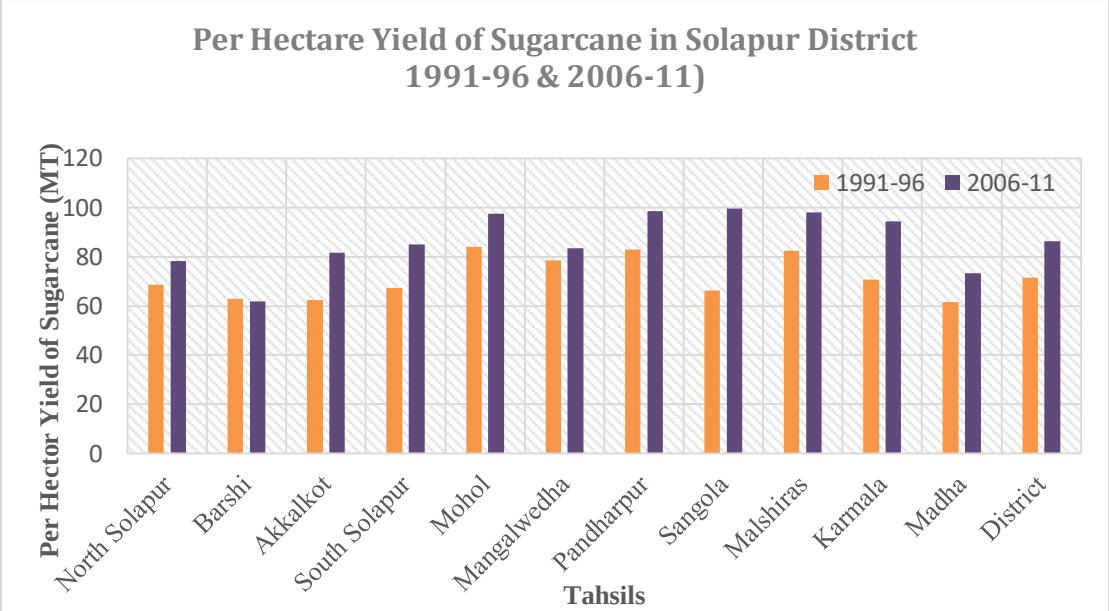

Fig. N0. 02

During the year 2006-11, the region as a whole has 86.28M.T. per hectare yield of Sugarcane. The tahsil level distribution of per hectare yield of Sugarcane is very uneven. The figure 2 shows that the high per hectare yield of Sugarcane is found in Pandharpur, Malshiras, Sangola, Karmala, North Solapur, Akkalkot and Mangalwedha tahsil i.e. above 80 M.T. because of

development of irrigation facility, the use of modern irrigation technology and high yielding variety of Sugarcane, Sugar Industry development and fertile soil. It was moderate in North Solapur tahsil i.e. 75 to 80 M.T. whereas it is low in Madha and Barshi tahsil i.e. below 75M.T. during the period of investigation due to lack of irrigation facility, less fertile soil and Barshi is well known for Jawar production.

During the period of investigation, the region as a whole has 9.86M.T. Positive change in per hectare yield of Sugarcane. The per hectare yield of Sugarcane increased in the all tahsil of study region excluding Barshi tahsil (-1.16 M.T.) The high increase is found in Sangola and Karmala tahsil i.e. above 20 M.T. per hectare, due to development of new irrigation facility and use of modern irrigation technology like drip irrigation. The moderate increase is observed in Akkalkot, Madha, Malshiras, Pandharpur, Mohol and South Solapur tahsil, whereas it is low in Mangalwedha and North Solapur i.e. below 10 M.T.

Conclusion:

The analysis demonstrates that the per hectare yield of sugarcane in Solapur district has improved considerably over the two decades under study, largely due to the development of irrigation facilities and the adoption of modern agricultural technologies. Tahsils such as Sangola and Karmala recorded remarkable increases in yield, reflecting the benefits of drip irrigation, fertile soil conditions, and access to sugar industries. In contrast, Barshi tahsil showed negative growth due to inadequate irrigation and a focus on alternative crops like jowar. Overall, the findings emphasize that irrigation remains the most decisive factor in overcoming climatic uncertainties in drought-prone areas.

The empirical result suggested that further expansion of drip irrigation, coupled with efficient water management, high-yielding varieties, and supportive agricultural policies, is essential for sustaining sugarcane production and strengthening the rural economy of Solapur district.

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