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## The Impact of Rainfall on Production of Jawar in Solapur District (2016-21)

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### Abstract

Agriculture occupies an important position in Indian economy. Agriculture provides food, fodder and raw material and thus contributes to overall economic growth. Bajra is the fourth most important food crop after Rice, Wheat and Jawar in India. It is an extreme drought tolerant crop and recommended for dry region. Jawar is the food crop in Marathwada and western Maharashtra region of Maharashtra. For the present investigation Solapur district is selected as a study region and only secondary information was collected from different sources. To examine the impact of rainfall on the production of Jawar, Pearson's Coefficient of Correlation technique has been utilized.

The study shows that, the maximum Jawar production observed in 2017-18 (574966 tone) when rainfall has 527 mm. and maximum amount of rainfall observed in the year 2019-20 (544.mm.) when Jawar production is only 356180 tone in the study region. The coefficient of Correlation in this regard is at  $r = + 0.64$ . The positive relationship between the rainfall (X) and Jawar production (Y) has been observed in the Solapur district. The empirical result suggested that, there is an urgent need to improve irrigation facilities, use high yield variety seeds and use modern technology for increasing Jawar production in the drought affected Solapur district. It is also suggested that government motivate to the farmers for growing a Jawar crop.

**Key Words:** Agriculture, Production, Rainfall

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### Introduction:

Etymologically agriculture geography deals with the arts and science of domestication of plants and animals (M. Husain, 2002). Agriculture occupies an important position in Indian economy. Its contribution to the national income in 1950-51 was up to 54 per cent which decline to only 18.50 per cent at present. Agriculture provides food, fodder and raw material and thus contributes to overall economic growth. Agriculture forms the back bone of Indian economy and food crops form the back bone of Indian agriculture. The importance of food crops was grows with the growth of population because these crops provide basic and essential food for man.

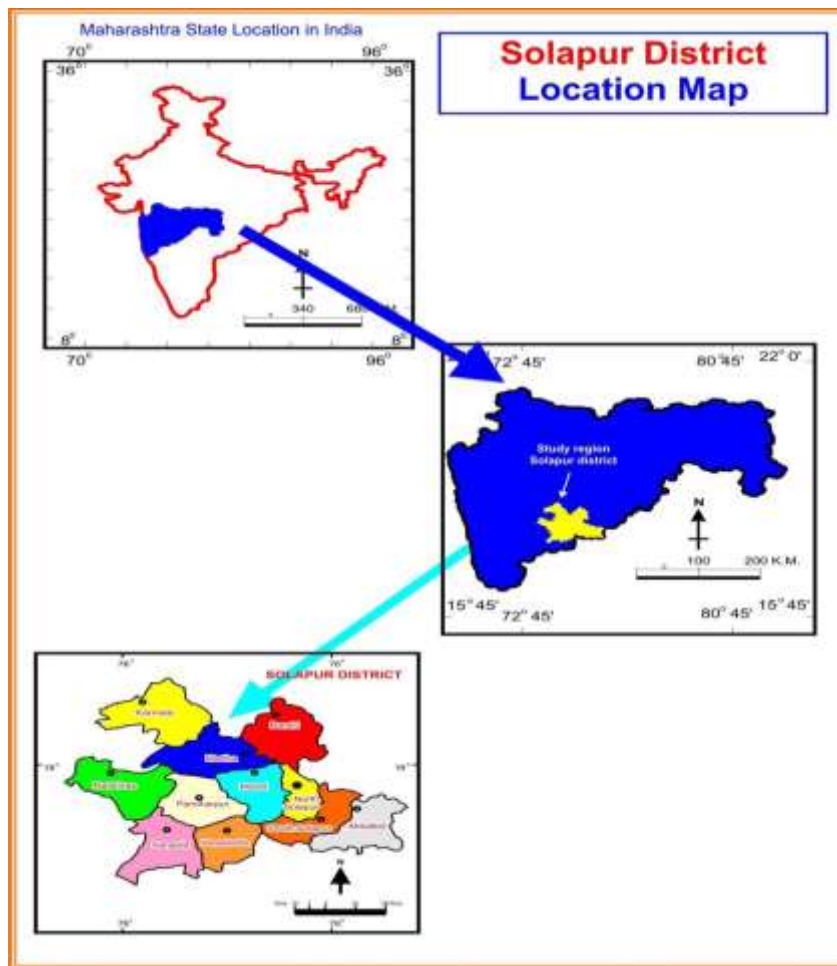
Bajra is the fourth most important food crop after Rice, Wheat and Jawar in India. Basically, Jawar is the crop of drought prone area. It is an extreme drought tolerant crop and recommended for dry region. Jawar is the food crop in Solapur district. It can be grown mostly in Kharif season. Rainfall is the only source of water for Jawar cultivation. Through the farmers use other source of irrigation for Jawar crop like canal water, well and bore well water. These are all again depending on rainfall for recharging. There is wide temporal variation in

production of Jawar in Solapur district. Therefore, attempt is made here to "Impact of rainfall on production of Jawar in Solapur district (2016-21)".

### Study Region:

For the present investigation Solapur district is selected as a study region. Geographically Solapur district is located between 17<sup>0</sup>10' North to 18<sup>0</sup>32' North latitude and 74<sup>0</sup>42' East to 76<sup>0</sup>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.



**Objective:**

The main objectives of this paper are as following,

- 1) To study the production and per hector yield of Jawar in the study region.
- 2) To examine the impact of rainfall on production of Jawar in Solapur District.

**Database and 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 like rainfall, Jawar production and geographical information collected through Agriculture Department, Socio-Economic review and district Statistical abstract of Solapur District for the year 2016-2017 to 2020-21 used. To examine the impact of rainfall on the production of Jawar, Pearson’s

Coefficient of Correlation technique has been utilized. The degree of relationship by considering rainfall as an independent variable ‘X’ and production of Jawar as dependent variable ‘Y’ is measured.

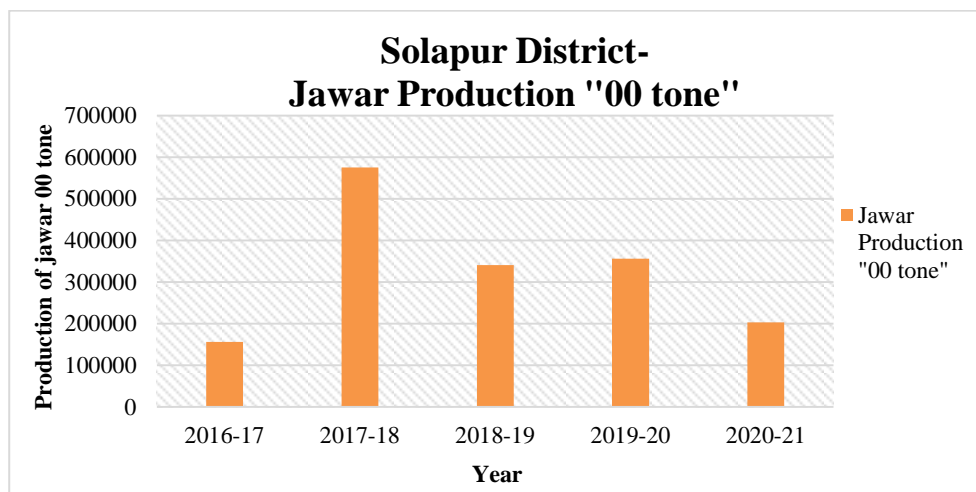
**Result and Discussion:**

Jawar is a semi-drier area crop. It grows well at a temperature between 27° and 32°C but temperature condition below 16°C is harmful for the crop. Jawar requires a rainfall between 300 mm to 400 mm. It is a popular crop of dry farming regions. Jawar is mostly grown on black soils. It also grown on poor light and *Murmad* soils. The Solapur district is well known for Jawar production due to its climatic and Soil condition. It is grown mainly in rabbi season. Following table no. 01 shows that year wise average annual rainfall, Jawar production and per hector yield of Jawar crop in Solapur District.

**Table No. 01**  
**Average Annual Rainfall, Per Hector Yield and Production of Jawar in Solapur District (2016-21)**

Sr. No	Year	Average Annual Rainfall (mm)	Annual Jawar Production (tone)	Per Hector Yield of Jawar
1	2016-17	257	156461	486
2	2017-18	527	574966	236
3	2018-19	333	341154	998
4	2019-20	544	356180	1242
5	2020-21	458	203052	339

(Source: socio economic abstract of Solapur district 2016-17 to 2020-21)



The study region has experienced fluctuate rainfall and production of Jawar during the investigation period. During the year 2016-17 the Jawar production has 1.56 lack tones and rainfall has 257 mm, after the next year (2017-18) production of Jawar increases and it is become 5.74 lack tones and the rainfall also increases, it has 527cm. During the year 2018-19 both Jawar production and rainfall have decreases as compared to 2017-18. During the year 2019-20 rainfall has 544 mm and Jawar production has 3.56 lack tones. In the year 2020-21 Jawar production is 2.03 lack tones and rainfall is 458 mm. There had been wide fluctuation in the production of Jawar from a minimum of 1.56 lack tones in 2016-17 to a maximum of 5.74 lack tones in 2017-18. The production of Jawar has more or less decreases from 2017-18.

According to table no. 1 per hector yield of Jawar has fluctuating during investigation period, it was 486 Kg. in 2016-17 and it was decreases and become 236 Kg in 2017-18. After that it was increases and become 998 in 2018-19. During the year 2019-20 the per hector yield of jawar has 1242 Kg. During the 2020-21 per hector yield of Jawar is 339 Kg.

In the context of objective following findings have come to light, the positive relationship between the rainfall (X) and production of Jawar (Y) has been observed in the Solapur district. The coefficient of correlation in this regard is at  $r = + 0.64$ . It indicates that there is a moderate positive relationship between the variable's 'X' and 'Y'. The degree of linear association between these two variables obtained by using the coefficient of determination ( $r^2$ ) is found to be at 0.41, which reveals that the independent variable (X) i.e, the rainfall is explaining 41 per cent of the total variations in dependent variable (Y) i.e. the production of jawar in Solapur district. It is a good explanation because 41 per cent of the variations in (Y) production of jawar to be influenced by the variable (X) i.e. rainfall and about 59 per cent of the variation is left to be influenced by other variables.

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### Conclusion:

From the above observation we can concluded that, the maximum Jawar production observed in 2017-18 (574966 tone) when rainfall has 527 mm. and maximum amount of rainfall observed in the year 2019-20 (544.mm.) when Jawar production is only 356180 tone in the study region. It shows that rainfall has most effective factor to controlling the production of Jawar crop.

The study shows that, the Moderate positive relationship between the rainfall (X) and Jawar production (Y) has been observed in the Solapur district. The coefficient of Correlation in this regard is at  $r = + 0.64$ . It indicates that there is moderate positive relationship between the variable X and Y theoretically. Means Jawar production is mostly depending upon the amount of rainfall. Other factors like duration of rainfall, soil type, temperature and contribution of farmer also responsible for jawar production. The empirical result suggested that, there is an urgent need to improve irrigation facilities, use high yield verity seeds and use modern technology for increasing Jawar production in the drought affected Solapur district. It is also suggested that government motivate to the farmers by making polices for growing a Jawar crop in the study region.

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