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Relationship Between Area, Production of Major Oilseed Crops and Rainfall in Rajasthan

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ABSTRACT

The major productions of oilseed crops in Rajasthan are groundnut, rape/mustard, castor seed, sesame, linseed, Taramira, and soybean. Different crops of oilseeds are used to produce vegetable oils and the byproducts are used for consumption of human and animal feed. Thus, oilseed crops are a part of major portion source of total production of oilseeds in the state. Climate condition is appropriate for the production of oilseed crops in the state (DES, Jaipur Agriculture report 2015-16). The present study is related to correlation between Production of major oilseed crops, Area and Rainfall. This study was based on secondary data (1985-86 to 2014-15). The data on Area, Production of oilseed and Rainfall were collected from Various Agriculture statistics report (1990-91 to 2015-16), DES, Jaipur (Rajasthan). The study revealed positive correlation between Area and Rainfall ($r=0.38$), Production and Rainfall ($r=0.56$) for selected oilseed crops in the state. This shows that in most of cases the amount of rainfall is not much related with the overall complicated sown area of oilseed and production in Rajasthan. Moreover, the relationship between Rainfall and total cropped area, production is not much significant and both the factors are dependent on some other factors of irrigation facility, fertilizers consumption, policies of govt., etc.

Key words: Oilseed, Area, Production, Rainfall, Rajasthan

Rajasthan is the largest state of the country covering nearly 10.42 percent of total area of the nation. At least 60 million of its population is dependents on agriculture. In the state Agriculture is primarily rain fed covering country's 13.27 percent of total available. The state has total area of 342.65 lakh. ha but the total cultivatable area is around 220 lakh ha only in the state. There is decrease in the gross cropped area was around 223.25 lakh ha during the year 1997-98 (DOA June, 2013 agriculture policy). After 10th FYP, the state increased its cereal production by more than 2.5 times the oilseed production by more than 2.5 times the oilseed production by 3.5 times [1]. The state enjoys 1st position in the country in production of Mustard/Rapeseed, Moth bean, Guar, Cumin and coriander. Currently, Rajasthan has a major share in production of Mustard/Rape seed (55 percent) of the country (Agriculture report Rajasthan, DES 2015).

The average rainfall of the state is 575mm, out of which about 532mm precipitation occurs in the rainy season i.e., June to September. The average rainfall of eastern Rajasthan

is about 704mm and that of western Rajasthan is about 310mm which reflects a vast variation. The average surface water is 1.16 percent of the country's water resources. The state has around 120 major and medium irrigation projects. The total cultivable command area of the state is 36.46 lakh ha. Oilseeds crop area and production are concentrated in the central and southern parts of India [2]. Mainly in these state as like- Madhya Pradesh, Gujarat, Rajasthan, Andhra Pradesh and Karnataka are major oilseed producer state in the country. The major cultivated oilseed crops in India and Rajasthan also are- Rapeseed, Soybean, Sesamum, Castor, Taramira Rapeseed and minor crops are Linseed, Niger seed and Groundnut, accounted for an area of 256.01 lac ha with the production 275.01 lac tons. India produces prominent position with 14.9% Groundnut and 10.7% Rapeseed with second and third rank respectively in the world (GOI report 2015-16). China has 1st rank in output and productivity of Groundnut. In the output of valuable minor oilseeds as like –Castor, coconut and Niger production India has rank first rank and 2nd in Sesamum and Linseed. The highest growing crops were observed are Soybean and linseed oilseeds. Rape/mustard seed and Groundnut oilseed crops performance the second important role in the Indian agriculture economy after food produce in standings of sown area and output. At present, use of land under oilseeds cultivation more than 27 million hectares of total sown area [3].

The cultivated area under oilseed crops has been increasing during this period and the output has registered

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many fold increase but its productivity is still very low as compared to other oilseed crops producing countries in the global level. The sown area, output and yield of oils crop cultivated at a CAGR (compound annual growth rate) of 1.58 percent, 3.05 percent and 1.45 percent, respectively. In this period from 1950-51 to 2009-10 production of oilseed crops has significant. Among the oilseed crops, the growth rate in area and production was the highest for Soybean 10.73 percent and 12.72 percent, respectively [4].

Scanty rainfall, scarcity of water and the inefficient water management practices constitute some of the major challenges in the state. Frequently drought leads to decline in productivity and reduced performance and even death of animals [5]. A comprehensive technology-based development approach to promote dry land/arid agriculture is the need of the period, to improve the situation of output of oilseeds crops in India, central government of the country has been hunting so many development schemes. Major oilseed producing government schemes are Cooperative Project, National Oilseed and Development Project, Technology Mission

Oilseeds (TMO) and integrated oilseeds scheme also. These development programs/schemes and especially the Technology Mission Oilseeds (TMO) gave rise to significant improvement in growth of production and productivity and oilseed crops in Mission Period (1990 decade onwards).

MATERIALS AND METHODS

The study is calculated by secondary data. The data collection will be based on the records of the directorate of agriculture and directorate of economic and statistics, government of Rajasthan and various journals and reports. The study would cover the area of Rajasthan based on the last three decade that is 1985-86 to 2014-15. There will be also used suitable and appropriate statistical tools correlation coefficient, co-efficient of variance etc. will be utilized to test the hypotheses. This study has found correlation between the Area, Production and Rainfall of major oilseed crops grown in the state of Rajasthan during 1985-86 to 2014-15.

Table 1 Correlation between amount of area cultivated and rainfall

		Correlations	
		Area cultivated	Rainfall
Area cultivated	Pearson correlation	1	0.381*
	Sig. (2-tailed)		0.038
	N	32	32
Rainfall	Pearson Correlation	0.381*	1
	Sig. (2-tailed)	0.038	
	N	32	32

*Significant at the 0.05 level

RESULTS AND DISCUSSION

As can be understood from the above tables of Karl Pearson correlation analysis between rainfall and total cultivated area of oilseed crops, we can see that there is positive degree of low correlation ($r=.38$) between the variables [6]. This shows that in most of times the rainfall is not much related with the overall sophisticated sown area of oilseed production in the state [7]. We can say that increase in

the areas of oilseed production is the sole decision of the farmers and related agencies and the choice of the same is dependent to some extent on the incidence of rainfall occurrence, but to a large extent on other factors like the characteristics of soils, availability of irrigation, policy measurements taken by the government, obtainability of agricultural inputs such as fertilizers, pesticides, credit from banks and cooperative societies, marketing infrastructure facilities and many other related issues [8].

Table 2 Correlation between production of oilseeds and rainfall

		Rainfall	Oilseed production
Rainfall	Pearson correlation	1	.559**
	Sig. (2-tailed)		.001
	N	32	32
Oilseed production	Pearson Correlation	.559**	1
	Sig. (2-tailed)	.001	
	N	32	32

**Significant at the 0.01 level

It can be understood from the above tables of Karl Pearson correlation analysis between amount of rainfall and total oilseeds production; we can see that there is positive degree of moderate correlation (0.559) between the variables. This result shows that in most of times rainfall is rather related with the total production of oilseed crops in the state. On the basis of above result we can say that there is a significant relationship between rainfall and oilseed production [9-10].

CONCLUSION

On the basis of above result we can say that, there is a significant relationship between the total cultivated Area,

production of oilseed and Rainfall, can be rejected the null hypothesis. We can say that increase in the production of oilseed is the not the sole result of rainfall rather there are some other many factors which involved. The market prices of the Oilseed production, policy of Government, MSP (Minimum Support Price), availability of farm inputs especially irrigation, fertilizers, pesticides, credit etc., and marketing infrastructures also play important role in the production of oilseed. Moreover, the researcher would like to mention that the relationship between the area of production and productivity is not much significant and both the factors are dependent on some other factors of rainfall, fertilizers, govt. policies, etc.

Table 3 Total area (lakh ha.), output (lakh tons) of oilseeds and amount of rainfall (cms) in Rajasthan

Year	Rainfall	Total Area	Total Production
1985-86	555.5	1409.98	250.51
1986-87	239.4	1433.94	382.12
1987-88	216.8	2051.05	645.36
1988-89	343.6	1778.94	624.95
1989-90	315.7	1669.43	1074.97
1990-91	377.0	2053.32	1234.32
1991-92	287.8	1937.70	911.55
1992-93	363.3	1499.47	882.24
1993-94	344.8	1948.78	1256.61
1994-95	331.8	2277.45	1917.39
1995-96	476.2	2526.13	1845.57
1996-97	494.8	3079.63	2355.62
1997-98	441.2	3561.94	2710.67
1998-99	381.2	3358.75	2541.53
1999-00	269.6	3613.11	2405.31
2000-01	370.2	3491.63	2834.03
2001-02	245.3	3843.15	3069.90
2002-03	203.7	3883.32	3529.38
2003-04	588.5	4421.45	3300.04
2004-05	536.5	4305.29	3815.41
2005-06	515.2	3635.29	3405.80
2006-07	360.1	2646.28	2032.56
2007-08	454.1	3105.62	3129.01
2008-09	649.6	2448.98	1754.68
2009-10	2003.5	3228.89	3996.42
2010-11	814.4	5133.34	5541.07
2011-12	676.8	5934.23	5934.91
2012-13	972.4	4508.04	5166.90
2013-14	1003.5	3995.59	4197.69
2014-15	989.2	4648.97	5178.46

Source: DES (Agriculture statistics- 2016-17); Government of Rajasthan

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