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## 13. Co-Relation Matrix of the Variables Influencing Agricultural Productivity in Beed District

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### Abstract

Advances in technology and scientific methods, have provided more accurate data and information about the various features of the geographical landscape, and this intern has provided an opportunity to search for the explanation about patterns of distribution of physical, economic, socio-cultural and biological elements and the relationship among them.

The present attempt is associated with the various physical socio-economic and biological variables. Therefore, we have established relationship between agricultural productivity on the one hand, and other variables on the other. Now, let us take variables one by one find out door relationship between the agricultural productivity and various other social economic and physical factors.

*Key words: Co-relation, Matrix, variables, Influencing, agricultural*

### Introduction

The measurement of association among the different elements of the geographical landscape and differences of the spatial patterns, require the application of appropriate techniques. The theoretical aspects of any phenomena occurring over the surface of the earth may not sometimes give very authentic information, but when it is provide on scientific ground then the facts and results became clearer.

In most of the aspects ate descriptive with the reasoning of how and why, are the most important enquires. Because, how and why provide an answer and support the argument discussed theoretically. In this study, both qualitative and quantitative aspects have its importance which denotes the quality and quantity of any component. (Table-1)

The use of statistical techniques and quantitative methods by using computers have enabled to bring out the most authentic and correct results from analysis of the data information.



associated with a particular region. Geographical information system (GIS) has opened the new ways to interpreted various kinds of bio-geographical problems within the study region. Geographical Information Systems (GIS) are applied to find out exact situation and position of the various geographical facts. The analysis by using the computers, with the help of soft ware programme, solves the different delicate agricultural problems within a short period of time.

#### **Agricultural Productivity and Fertilizer Input**

The agricultural productivity in Kg per hectare on the one hand and fertilizers input on the other has been taken as two variables influencing agricultural productivity. The co-efficient of co-relation was calculated which comes to 0.39. This clearly indicates that the positive value of 0.39, though, is not very significant, yet it indicates that the fertilizer input in Kg per hectare as increases, the agricultural productivity also increases accordingly. The Beed district is a region, where there is scarcity of water and the application of fertilizer is generally restricted in dry region. This positive value of co-efficient correlation reveals that in areas where enough irrigation facilities are available, the use of fertilizer per hectare by the farmers is relatively higher. Hence, the yield per unit of area is also higher. It may be stated that the use of fertilizer certainly enhance the agricultural productivity, particularly in the region where sufficient water is available for irrigation.

#### **Agricultural Productivity and Proportion of Cultivable Land**

The co-efficient of correlation is positive of 0.27 between the agricultural productivity per unit area and percent of cultivable land. Like fertilizer input in kg, the proportion of cultivable area has also positive relationship with the productivity per hectare of area. The cultivable land though sizable in Beed district, yet proportion of non-irrigated land is relatively higher; hence, the productivity per acre in relation to cultivation land is not much higher. Beed district is a region where no commercial and cash crop are of greater importance due to the scarcity of water for irrigation. The cultivable land and the agricultural productivity have a positive relationship in the district. As the percentage of cultivable land increases, accordingly the productivity of agriculture also increases. (Table-2)

#### **Agricultural Productivity and Net Sown Area**

Percentage of net sown area on the one hand and the productivity of agriculture per hectare, on the other hand have been taken two variables to represent relationship between the two; It reveals very insignificant relationship but negative. Surprisingly, with the increase of net

small area the productivity of agriculture per unit of area in kg declines, it means that with larger size of net sown area, the decline in agricultural productivity has been observed in the region. This may be attributed for larger size of non-irrigated net sown area within the district of Beed.

#### **Agricultural Productivity and Rainfall**

Contrary to expectation, the relationship between agricultural productivity, shows a negative relationship and also quite insignificant. The larger area in the district of Beed is based on monsoon rainfall; particularly for cereals while the co-efficient of co-relation value represent insignificant relationship with per unit area of agricultural productivity. In other words, the distribution of rainfall which is not reliable and it is most erroneous and unpredictable. Hence, rainfall depicts a negative relationship with the productivity of agriculture in Beed district.

#### **Agricultural Productivity and Irrigated Area**

As per expectation, the relationship between agricultural productivity and irrigated area represent positive relationship. As it is clear from the co-efficient of co-relation value, with the increase of irrigated land, the agricultural productivity also increases. Hence, agricultural productivity per unit area also increases, within the district of Beed.

#### **Agricultural Productivity and Land Holding**

The co-efficient of co-relation value between these two variables is (-0.31). It clearly indicates that with large size of land holding; the agricultural productivity per unit of area decline. This may be attributed to low input per unit of area in the larger size of land holding. In other words, the agriculture productivity is higher for small land holders, within the district of Beed.

#### **Agricultural Productivity and Workers in Agriculture and Manufacturing**

The co-relation matrix represents negative insignificant values for the agricultural workers and worker in manufacturing. Due to the application of mechanization, the importance of agricultural workers and workers in the manufacturing has no impact upon the agricultural productivity. Therefore, negative relationships have been represented between the productivity per unit of area on the one hand and the percentage of manufacturing on the other hand within the district of Beed.

#### **Agricultural Productivity and Plough, Engines, Bullock Cart and Tractors**

The co-relation matrix between agricultural productivity per unit area on the one hand, and number of tractors on the others has been calculated. All give positive values of co-efficient



of co-relation, but all of them are insignificant. This depicts that these variables have not significantly influenced the agricultural productivity per unit of area in different parts of Beed district.

#### **Agricultural Productivity and Road Per 100 Sq Km Area**

Surprisingly, the value of co-efficient of co-relation between agricultural productivity per unit of area on the one hand, and road length per hundred Sq Km of area shows a very significant positive relationship. It is clear from the facts that the value of co-efficient of correlation is (0.61). This means that with increasing, means of accessibility like village road, district road, state high way and national high ways, have provided easy transportation facilities to the farmers, to send their agricultural produce to market center for sale. It has encouraged to farmers to higher inputs and investment in agriculture which in turn has positively influenced agricultural productivity per unit of area in several parts of Beed district.

#### **Agricultural Productivity and Percentage of Rural Population**

Due to low degree of mechanization and less implementation of modern facilities still in a country like India has resulted in the large size of rural population which is still engaged in agricultural activities. This shows, that with higher proportion of rural population, the agricultural productivity per unit area lagging behind, than many developed and advanced regions. Therefore, productivity and rural population show positive insignificant relationship in Beed district.

#### **Agricultural Productivity and Percentage of Urban Population**

It represents negative and insignificant relationship with the agricultural productivity. It may be stated that with the urbanization, the agricultural productivity go on declining within the district of Beed.

#### **Agricultural Productivity and Density of Population**

The co-relation co-efficient value for agricultural productivity per unit of area and density of population has shown a negative insignificant relationship within the district of Beed. The co-efficient value reveals that with increasing density of population per Sq Km of area, the productivity of agriculture declines to a certain extent. The optimum size of population gives maximum return from the agriculture. The pressure of population creates a number of problems which adversely influence the agricultural productivity per unit of area. The higher size of population results in the lower per capita income which is a common rule which in turn influence

low inputs and low investment per unit of agriculture area in such regions. Hence, the agricultural productivity per unit area and density of population shows negatively relationship within the district of Beed.

Sr. No	Taluka	Productivity Kg/hectare	Fertilizer in KG	% of cultivable area	% of Net sown area	% of irrigated Area	Ramta in MM	% of land holding	% of Agriculture Worker	% of worker in manufacturing	% of Wooded plough	% of Iron plough	% of Oil engine	% of Electric pump	% of Bullock cart	Number of tractor	Road per 100sq km area	% of rural pop	% of urban pop	POP density per sq. km	% of literacy rate
1	Ashti	709	125	94	67.7	285	541	1.9	27.3	1.89	5.5	7.9	7.6	4	7.5	5.1	202	100	0	139	64.4
2	Patoda	365	90	73	71.2	25.8	534	2.2	31.7	2.5	7.8	7.4	7.4	3.3	7.2	8.4	103	100	0	261	65.5
3	Shirur	477	110	20	28.3	21.9	596.5	2.2	35.5	5.56	0.01	19.1	10.4	5	16.7	8.4	81	100	0	264	64
4	Georai	398	105	63.2	596	27.8	617	3.4	9.2	36.2	8.3	48	4.1	3.6	5	4.5	96	89.2	10.85	180	85.3
5	Majalgaon	547	90	72.2	69.6	26.8	574	26	42.2	2.42	148	3.7	7.9	2.5	3.9	1.3	78	79.5	20.48	238	66.4
6	Wadwani	431	110	73.3	70.8	57.3	574	2	34.5	54	10.7	6.5	1.9	15.3	6.9	17	28	100	0	890	61.1
7	Beed	434	120	63.5	60	43.7	463	1.9	39.5	5.24	11	13	25.5	5.1	13.6	9.4	151	64.9	35.14	259	74.1
8	Kajj	355	95	53.1	51.3	28.2	463	1.8	30.2	2.9	6.1	10.3	2.4	2.5	10.8	3	49	100	0	191	68.5
9	Dharur	341	95	69.8	67.8	10.5	520	2.7	334	1.54	5.8	4.6	13.6	5.4	4.8	3	94	70.5	29.47	106	65.5
10	Parli	443	100	72.5	69.3	262	617	3.6	49.9	5.3	15.3	8.1	13.3	4.2	8.5	5.6	60	62.3	37.68	318	70.7
11	Ambejogai	302	115	73.8	70.6	25.3	676	3.3	48.1	2.82	148	14.4	6	3.2	13.1	4.9	65	70.5	29.48	141	73.6
	District	454	115	66	63.5	29.5	561	2.3	31.6	10.4	100	100	100	100	100	100	86	82.1	207	207	60.5

Source - Socio Economic Abstract Of Beed District 2000-01

Table- 1: Variables influencing Agriculture in Beed District



% Productivity	Productivity Agriculture	Fertilizer in KG	cultivable	% of Net	Irrigated	Rainfall in MM	% of land holding	Agriculture	In	Wooden	% of Iron plough	% of Oil	% of Electric pump	% of Bullock cart	Number of tractor	100sq km	% of rural pop	% of urban pop	% of literacy rate	
0.394819718	1	1																		
0.27437128	0.11741281																			
-0.024107228	0.115078696	0.91852749	1																	
0.128076007	0.382785547	0.15557308	0.16733124	1																
-0.078500002	0.104418709	0.32137865	0.19928184	-0.35910.07	1															
-0.182832009	-0.198984195	0.11807105	0.26418712	-0.377919	0.753576	1														
-0.087823907	-0.037310357	0.04753662	0.19050006	0.0161009	0.16295193	0.14859379	1													
-0.107150931	0.071238415	-0.12928657	-0.12822859	478043	0.29725252	0.42732028	-0.007649	1												
0.021397943	0.252159026	0.0872943	0.1466554	0.05338719	0.05804973	-0.007649	-0.007649	0.00564555	0.10739783	1										
0.025486858	0.306726911	-0.11819799	-0.09984841	0.00664993	0.01740752	-0.12580112	-0.0777929	0.09184653	0.0771929	0.96184653	1									
0.057189043	0.252920295	-0.02168909	0.00919578	-478988	-0.09185573	-0.0410226	0.0018139	0.00581555	0.96081624	0.9077158	1									
0.045246687	0.259274861	0.16175	0.04238182	0.09443329	0.0274338	-0.12851933	-0.08259628	0.11031186	0.87781001	0.9393123	0.9877968	1								
0.024618711	0.29070551	-0.09509242	-0.0720072	0.04722307	130294	-0.12725507	-0.03367242	0.318374	0.39754082	0.99949044	0.37189439	0.87898884	1							
0.04082111	0.281948746	-0.0142536	0.02439111	0.12482745	-0.00183538	-0.14778853	-0.07833385	0.10881112	0.97247405	0.97949032	0.98046976	9970513	0.98288407	1						
0.672405514	0.4822073	0.3478304	0.04819092	-0.1296543	-3173933	-0.2960829	-0.07162238	0.07869551	-0.03320054	-0.03320054	0.07320905	-7452179	0.03327287	-0.00099202	1					
0.089736369	0.094278765	0.26528495	0.30104376	262881	0.25883607	-0.2812026	0.804342	0.89502287	21992071	0.18926715	24143605	0.15339656	0.19274332	0.19339007	0.044355	1				
-0.01670221	-0.065730188	-0.24488797	-0.25911439	0.00202759	0.20452684	0.46922684	-0.0007723	0.91357865	-0.26477795	-0.26477795	-0.27221983	0.24852462	24210568	0.2494479	-221941	-1				
-0.141831796	0.04139825	-0.09531222	-0.09319826	0.00782256	0.10559709	-0.06988953	0.04168877	0.0442083	-0.0918491	-0.0918491	-0.02850242	0.04175557	0.0777663	-0.04251562	-0.01237298	0.92830357	0.54633296	1		
0.12589349	0.253496205	-0.4381071	-0.43719045	0.17319403	0.20820137	0.04861912	0.04861912	-0.55441207	0.73421788	0.08693075	0.11170069	0.18335065	0.14860433	0.16287832	0.17619679	0.16248813	0.71271781	77128891	0.7155885	1

Source - By Statistical Correlation Method Using Microsoft Excel

Table- 2: Correlation Matrix of Variables Influencing Agriculture



### **Agricultural productivity and literacy**

Thus positive insignificant relationship between agricultural productivity and literacy rate, represent the increasing trend of agricultural productivity per unit area. The farmers, who are relatively educated, apply their Knowledge, intelligence and expertise in the practice of agriculture. Literate farmers are socially much aware and through all means, give much attention for agriculture. Hence, with increasing literacy rate the productivity of agriculture per unit of area increases within the district of Beed.

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