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Influence of Physico-economic Factors on Agricultural Productivity of Village Nandpur, Tahsil Nandurbar, Maharashtra

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Abstract:

Present paper deals with the assessment of physico-economic factors of agricultural productivity of village Nandpur in Nandurbar district of Maharashtra State. Agricultural productivity is a functional outcome of the physical base of the agriculture and socio-economic determinants. For this purpose some physico-economic determinants were taken into consideration. The data regarding physical elements of soil was collected from analysis of soil samples. Secondary data was collected from different government agencies. Information about socio-economic elements was collected from interviews of farmers, questionnaires etc. The study reveals that the agricultural productivity is influenced by physical factors.

Key words: Socio-economic determinants, Physico-chemical elements, Soil analysis, Questionnaire, Personal interviews.

Introduction:

Agricultural productivity is the functional outcome of the physical base of the agriculture and socio-economic and cultural

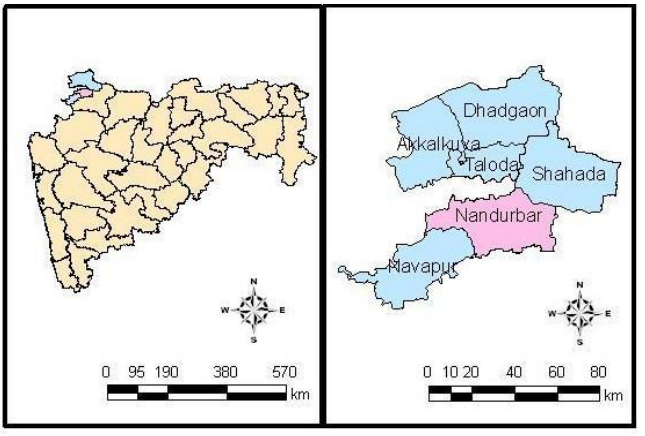
determinants (Vishwakarma, 2003). It is becoming important as world's population continues to grow. Agricultural productivity is the result of interrelationship among a number of growth factors and soil is one of them. Productivity is the ability of soil to produce crops.

In order to understand farmers' economic condition out of the total households of this village a sample of twenty five households representing different categories of size of holding was selected. Twenty soil samples were collected representing the farms of different households and also different part of the village.

In the present study agricultural productivity is measured which is influenced by a number of physico-economic factors with the help of statistical techniques.

Study area:

Nandpur is a tribal village located at twenty one kilometers in the west of Nandurbar. The village is located in the plain of Ranka Nallah a tributary of river tapi. The total population of the village is 917 according to 2011 Census. The village is a small tribal settlement which covers 344 hectares area. The soil of the village is fertile black cotton soil.



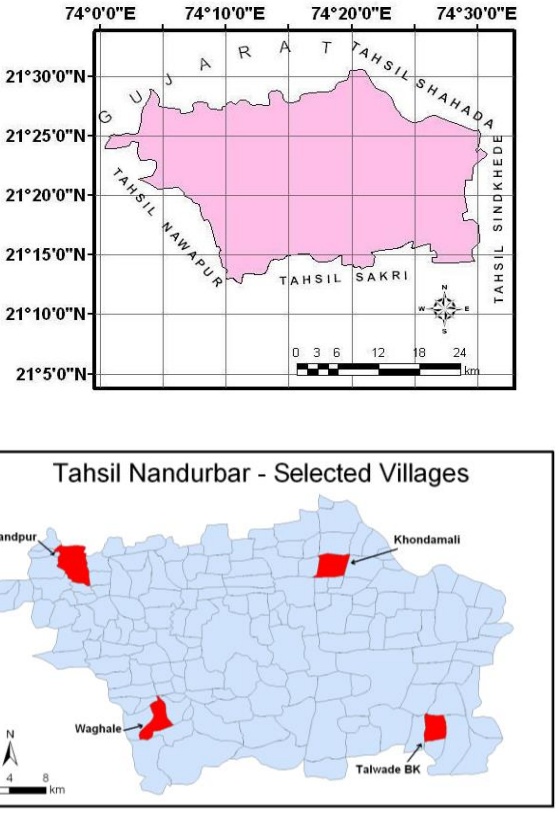


Fig.1: Location Map of Study Area

Aims and Objectives:

- To examine the socio-economic conditions of the farmers.
- To find out the variation in the soil and the contained elements.
- To find out the major crops of the region.
- To study the yield of major crops and their relationship with the physico-economic factors.

Database and Methodology:

The study is based on primary data. The yield of crops per hectare is achieved thorough the questionnaire and interview,

and soil samples were collected from the various parts of the village. These soil samples were analysed in the laboratory of PSGVPMS Agriculture College, Shahada, District Nandurbar. The analysis and results of both questionnaires and soil samples were studied through statistical techniques like coefficient of correlation and multiple regression analysis. These results are depicted through the statistical table and graphical presentation for the yield of major selected crops i.e. Jowar, Bajra, Cotton, Corn and Wheat.

The agricultural productivity is related with many elements i.e. physical, climatic and socio-economic factors. In the present study, the degree of correlation between physico-economic factors like soil characteristics, total income, family size, number of fragments and agricultural productivity has been studied by generating farm level data. Also input output structure i.e. input used in agriculture and output, total expenditure on family and farm is studied for Nandpur. In order to assess the impact of physic-economic variables upon agricultural productivity following sixteen variables are considered. Y_1 is dependent and X_2 and X_{16} are independent were carefully selected from the set of available variables. Productivity of five major crops i.e. jowar, bajra, cotton, corn and wheat are taken into consideration.

Y_1	:	Yield of crop
X_2	:	pH
X_3	:	Ece mm
X_4	:	Organic compound in per cent
X_5	:	Nitrogen (kg/hectare)
X_6	:	Phosphorous or phosphate (kg/hectare)
X_7	:	Potassium (kg/hectare)
X_8	:	Ee (ppm)
X_9	:	Zn (ppm)
X_{10}	:	Cu (ppm)
X_{11}	:	Mn (ppm)

X_{12} : Total income (Rs.)
X_{13} : Family size
X_{14} : Size of holding
X_{15} : Number of fragments
X_{16} : Expenditure (Rs)

Thus, here pH, Ece, Organic compound indicate the physical characteristics of soil, while the proportion of chemical elements like nitrogen (N), phosphorous (P) and potassium (K) tell us about the quantity of nutrients present in the soil. The minerals like ferrous (Fe), zinc (Zn) copper (Cu) and manganese (Mn) are the micronutrients require for the growth of crops. Other variables like total income, family size, size of holding, number of fragments and expenditure are chosen to indicate the economic factors influencing agricultural productivity.

A correlation analysis to find out the productivity some statistical techniques have been used by King (1961), Thomas (1960), Majid Hussain (1976) and Dayal (1984), etc. Here, in order to find out the relationship between the yield of crop and important physico-economic variables Pearson Product Movement Coefficient of correlation is used. The results are summarized as under.

The correlation is shown as below:

1. r<0.3 : Insignificant correlation
2. r=0.3 to 0.7 : Significant Correlation
3. r=0.7 : High degree Correlation.
4. r=+1 : Perfect Positive Correlation.
5. r=-1 : Perfect Negative Correlation.
6. r=0 : No correlation.

Table-1: Correlation Matrix Village Nandpur.

Sr. No	Name of Crop	Jowar	Bajara	Corn	Cotton	Wheat
1	pH	-0.78	-0.31	0.49	0.07	-0.38
2	Ece (mm)	0.36	0.38	-0.62	0.53	-0.57

3	Organic Compound %	-0.40	0.85	0.42	0.38	-0.01
4	N (Kg)	0.55	0.44	0.47	-0.12	0.95
5	P (Kg)	-0.74	-0.86	0.66	0.47	-0.43
6	K (Kg)	-0.59	0.67	-0.66	0.54	-0.38
7	Fe (ppm)	-0.22	0.48	-0.51	0.21	0.16
8	Zn (ppm)	0.17	0.50	-0.83	0.24	0.43
9	Cu (ppm)	0.56	0.42	-0.86	0.07	0.47
10	Mn (ppm)	0.32	0.78	-0.55	0.71	-0.04
11	Total income (Rs)	-0.14	0.76	0.76	-0.23	0.93
12	Family size	-0.34	0.21	-0.87	0.08	-0.87
13	Size of holding (Hect)	0.13	0.33	0.07	-0.33	0.76
14	No.of fragments (Hect.)	0.00	0.33	0.42	-0.17	0.41
15	Expenditure (Rs.)	-0.11	0.67	0.83	-0.13	0.97

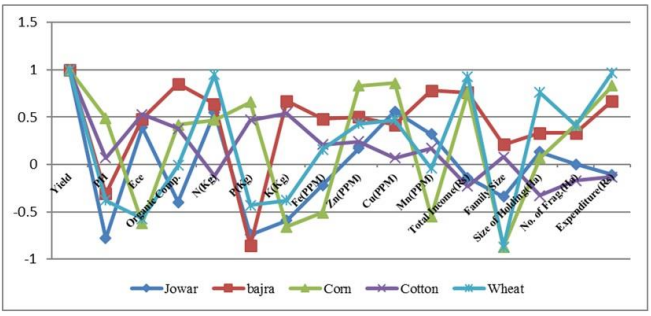


Fig.2: Graph of Correlation Analysis

Correlation Analysis:

Jowar: Village Nandpur has also many variables of physico-economic factors show positive correlation. Here, low correlation is shown with Zinc (r=0.17) and size of holding (r=0.13), nitrogen (r=0.55), copper (r=0.56) and manganese (r=0.36) with the yield of jowar. The variable of number of fragments has no correlation (r=0.00) with the yield. Here, economic factors are less important than physical factors (Table-1, Fig.2).

Bajra: Nandpur village has insignificant correlation of family size with the yield of bajra (r=0.21), and many other variables are having significant correlation i.e. Ece(r=0.48), nitrogen (r=0.64), potassium (r=0.67), ferrous (r=0.48), zinc (r=0.50), copper (r=0.42) size of holding (r=0.33), number of fragment (r=0.33) and expenditure (r=0.67) with the yield of bajra. Besides this manganese (r=0.78), total income (r=0.85) has high degree correlation with the yield of bajra (Table.1, Fig.2).

Corn: In village Nandpur, significant correlation is with the yield of corn is of pH(r=0.49), organic compound (r=0.42), nitrogen (r=0.47), number of fragments(r=0.42). Total income (r=0.76), expenditure (r=0.83) show a high degree correlation while size of holding show very low degree correlation (r=0.07) with the yield of corn. Here, micronutrients show negative correlation (Table-1, Fig.2).

Cotton: Village Nandpur has insignificant correlation with the yield of cotton is of pH (r=0.07), ferrous (r=0.2) and family size (r=0.08). A significant correlation with Ece (r=0.53), organic compound (r=0.38), phosphorous (r=0.47), potassium (r=0.54) the yield of cotton. Any other variables show negative correlation with the cotton yield (Table-1, Fig.2).

Wheat: In village Nandpur ferrous (r=0.16) has low correlation with the yield of Wheat. Zinc (r=0.43), Copper (r=0.47) and number of fragments (r=0.41) has significant correlation with nitrogen (r=0.95), total income (r=0.93) and expenditure (r=0.97) show almost perfect correlation with the yield of wheat (Table-1, Fig.2).

Conclusion:

1. Agricultural productivity is mostly influenced by physical factors in village Nandpur.

2. Social factors play negative role in the yield of crops.
3. Micro-nutrients are excess in the soil than they require for the growth of crop and therefore it show negative correlation i.e. Fe, Zn, Co and Mn.
4. To increase the yield of crops it is necessary for farmers to analyse the soil from the laboratory. Which many help to increase the production.

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