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SPATIO-TEMPORAL DEVELOPMENT OF FERTILIZER CONSUMPTION IN SOLAPUR DISTRICT

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ABSTRACT :

Modern agriculture relies on adequate and timely supplies of inputs. Fertilizer being a key input, directly effects on agricultural production and development of rural area. The main purpose of this study is to assess the spatio-temporal development in the consumption of fertilizer in Solapur district. The consumption of fertilizers in the district has increased tremendously from 0.27 lakhs M. Tones in 1993-94 to 3.62 lakhs M. Tones in the year 2013-14, and marked 12.99 times increase in fertilizers consumption during the period of investigation. Nitrogenous (N), Phosphetic (P) and Potassic (K) fertilizers are utilized in the study region. The highest consumption of nitrogenous fertilizer is marked 2.80 lakhs M. Tones in the year 2013-14. Use of phosphetic fertilizers was 0.45 thousand M. Tones during 1993-94, as against 5.54 thousand M. Tones in 2013-14 and recorded 12.31 times increase in the consumption of phosphetic fertilizer during the same period. Whereas, the consumption of potassic fertilizer is registered 0.25 thousand M. Tones in 1993-94 and 2.67 M. Tones during the year 2013-14. The highest index of fertilizer consumption is registered in Pandharpur tahsil (222.58 kg/hectare) and lowest in Akkalkot tahsil (63.29 kg/hectare) in the year 2013-14.

KEYWORDS : *Green Revolution, chemical fertilizer, fertility of soil, Solapur district.*

INTRODUCTION

Fertilizer is regarded as an important component of Green Revolution. The fertilizers are one of the most effective means of increasing crop productivity per unit area. To increase food production by the area increasing method is no longer possible and land, which is suitable for cultivation, has already been brought under the cultivation.

If more food production is not to be achieved by increasing the land under farming, then there is food problem. The solution to this problem is increasing soil fertility by through the application of fertilizers. Even the Father of the Green Revolution Dr. Norman Borlaug (1979) pleaded for more investment in fertilizers. Use of fertilizers are important because they boost crop production.

The cultivator in the district till the end of the first quarter of the 20th Century used only manures and that too very scarcely. Today the application of fertilizer to agricultural land has become a common phenomenon all over the study region.

STUDY AREA

The district of Solapur is one of the most important district of Maharashtra State, both in terms of area and population. District is situated entirely in the Bhima river basin, in Southern Maharashtra. Solapur district lies between 17°10' to 18°32' North latitudes and 74°42' to 76015' East longitudes. The east-west length of the district is about 200 km and

south-north width is about 150 km.

LOCATION MAP

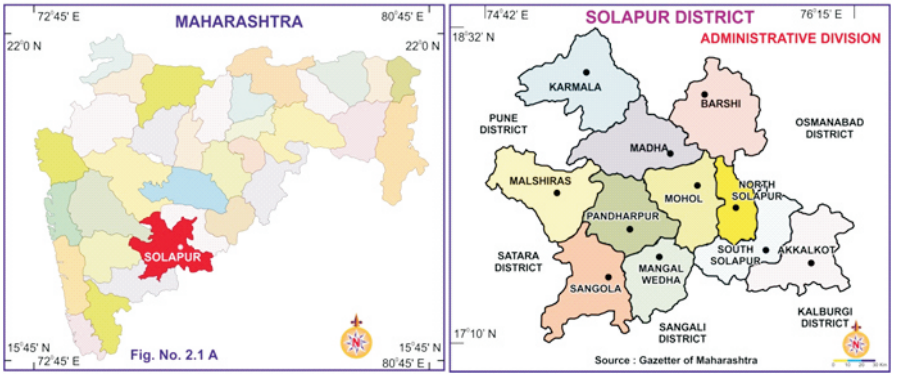

FIG. NO. 1

The total geographical area of the district is about 14895 sq.km., with population of 43,25,527 according to 2011 census. Karmala is the largest tahsil in area and the smallest is North Solapur tahsil. The western boundary of Malshiras tahsil forms hills, known as the Phaltan range, in the extreme south-west and south of Sangola, the eastern flanks of the Mahadev range, from an average height of more than 600 meters and Balaghat range extended on the northern boundary of the study region. The average annual rainfall is marked 545.6 mm and rainfall clearly reflects the influence of topography.

DATABASE AND METHODOLOGY

The work is based on secondary sources of data. The data collected and used for the period 1993-94 to 2013-14. Secondary data obtained from Socio-Economic Review, District Statistical Abstract, Season and Crop Reports published by agricultural department. The collected data is processed and represented by various cartographic techniques. Tahsil is considered as areal unit for the present investigation work. The spatial pattern of fertilizer consumption is derived by following formula.

$$Ife = \left\{\frac{Rf}{Df}\right\} \times 100$$

Where, Ife - Index of Fertilizer Consumption
Rf - Per hect./Kg. Fertilizer Consumption in Tahsil
Df - Per hect./Kg. Fertilizer Consumption in District

RESULT AND DISCUSSION

TRENDS OF FERTILIZER CONSUMPTION

Utilization of improved seeds in area under certain crops as sugarcane, horticulture crops etc. use of chemical fertilizers has increased rapidly in the district. Table- 1 shows that the consumption of nitrogenous fertilizer in the district has increased from 20769 M.T.s in 1993-94 to 280000 M.T. in 2013-14, and marked 13.89 times increase in the consumption of same fertilizer during period of investigation. The highest consumption of nitrogenous fertilizers are marked 180511 M.T. during the period of 1994-2000 and lowest during year 2006-14.

Table 1: Consumption of Fertilizers, 1993-2014 (Fig. in M.T)

Type of Fertilizers	Years				Volume of Change		
	1993-1994	1999-2000	2005-2006	2013-2014	1994-2000	2000-2006	2006-2014
Nitrogenous (N)	20769	201280	250440	280000	180511	49160	29560
Phosphetic (P)	4508	51160	58680	55442	46652	7520	-3238
Potassic (K)	2590	34220	39490	26795	32630	5270	-12695

Source: District Superintendent- Agricultural Department, Z.P. Solapur

Use of phosphetic fertilizers was 4508 M.T. during the year 1993-94 as against 55442 M.T. in 2013-14. While during the year 2006 and 2014, the use of phosphetic fertilizers marked 3238 M.T. decrease in the district (Fig. 2).

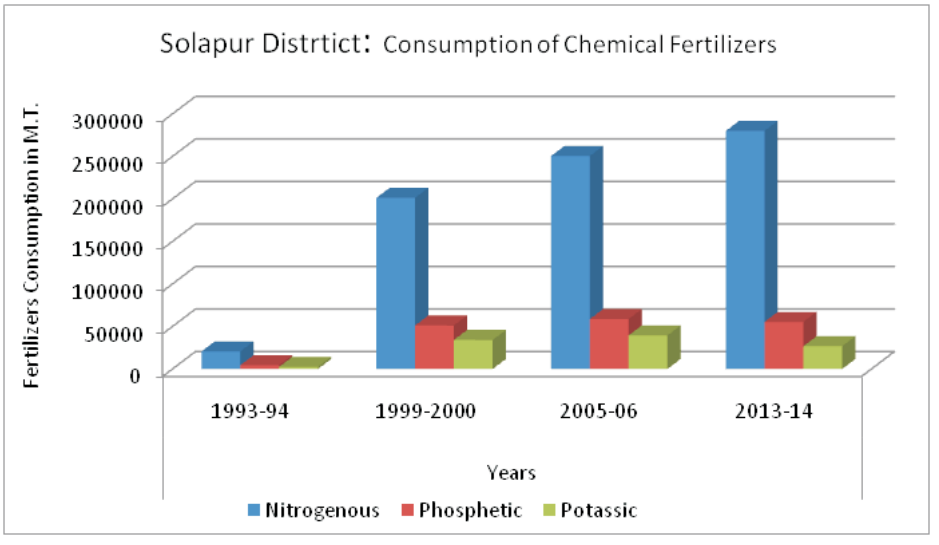

Fig.2

The consumption of potassic fertilizer increased 10.34 times during the study period. But in the year 2006-14, the consumption of same fertilizers is registered 12695 M.T. decrease in the Solapur district.

Due to the substantial development in the irrigation mainly from lift, canal, well and tube well. Although the general trend of fertilizer consumption witnesses an upward orientation for the last 20 years. Per capita and per hectare consumption is satisfactory as compared to the State.

SPATIAL VARIATION IN USE OF FERTILIZERS

The consumption of fertilizers is varied from tahsil to tahsil in the study region. Fig. 3 exhibited that the highest fertilizer consumption kg/hectare is registered in Pandharpur tahsil (222.58 kg/hectare). Whereas, state average per hectare fertilizers consumption is marked about 163.8 kg/hectare during the year 2013-14. The lowest fertilizer consumption is marked in Akkalkot tahsil (63.29 kg/hect.) during the same year.

The consumption of fertilizers in kg/hectare is grouped into four categories, viz., Very High, High, Moderate and Low (Fig. 3).

I. VERY HIGH CONSUMPTION (ABOVE 130 KG/ HECTARE)

Very high index of fertilizer consumption is marked in Malshiras (135.48 kg/hectare) and Pandharpur (222.58 kg/hectare) tahsils during the year 2013-14.

These tahsil have permanent water for irrigation, dominance of sugarcane cultivation and location of sugarcane factories. Besides this, the farmers of irrigated track are socially and economically capable to adopt new technology. As a result, these tahsils possess high level of fertilizer consumption.

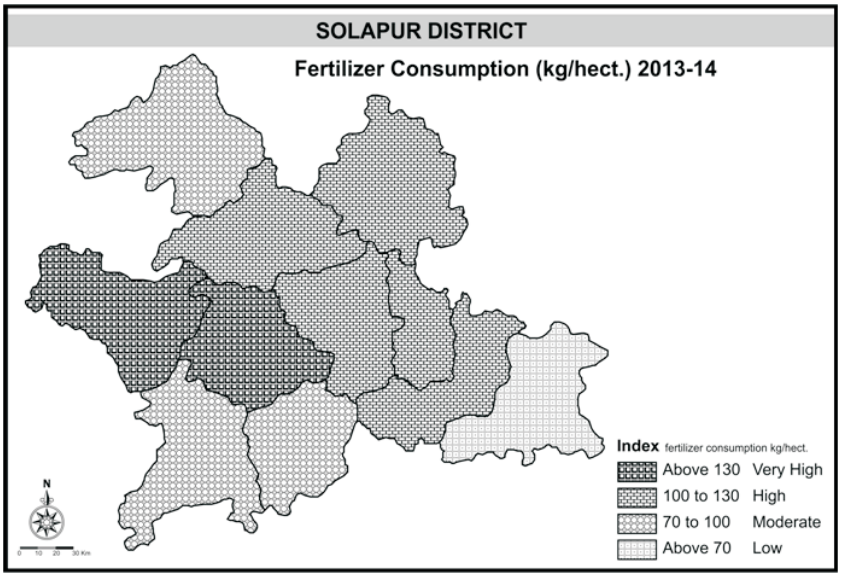

Fig.3

II. HIGH CONSUMPTION (100 KG TO 130 KG/HECTARE)

This group comprises tahsils namely Madha (106.45 kg/hect.), Mohol (116.2 kg/hect.), N. Solapur (109.60 kg/hectare) and South Solapur (129.90 kg/hectare) and Sangola (130.00 kg/hectare) tahsils. Where recently the various sources of irrigation are developed, through these sources crops are irrigating, with the introduction of irrigation facilities farmers are able to grow cash crops like sugarcane, cotton, horticulture, etc. All these crops require high dosage of chemical fertilizer for better growth and high quality of production.

III. MODERATE CONSUMPTION (70 TO 100 KG/HECTARE)

Modern consumption of fertilizers is found in Karmala (93.5 kg/hectare) and Mangalweda (96.77 kg/hectare) tahsils during the same year. Where moderate input facilities are available for crops cultivation.

IV. LOW CONSUMPTION (BELOW 70 KG/HECTARE)

Low consumption is experienced only in Akkalkot tahsil.

Use of fertilizers per hectare of cropped area has low correlation (r=0.35) with the value of crops per unit of cropped area, but moderate with the use of high yielding variety of seeds (r=0.58) and high with the extent of irrigated area (r=0.72). It is evident that fertilizers are mostly popular in irrigated tracts. The high positive correlation between the uses of fertilizers and high yielding variety is due to the third variable, i.e. irrigation.

CONCLUSION

Fertilizers is one of the most important component of Green Revolution.

Farmers get relatively quick returns, if they use adequate fertilizers in proper time. Fertilizers boost crop production and are also vital in the use of other improved techniques. Three types of chemical fertilizers viz. nitrogenous, phosphatic and potassic are used in the district. The highest consumption of nitrogenous fertilizers is marked 180511 M.T. during 1994-2000.

The highest index of fertilizer consumption is marked in Pandharpur tahsil and lowest index of fertilizer consumption is registered in Akkalkot tahsil during the period of investigation.

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