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"ROLE OF INFRASTRUCTURAL AND INSTITUTIONAL FACTORS IN THE RECENT TRASFORMATION OF AGRICULTURE IN SOLAPUR DISTRICT"

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ABSTRACT

griculture plays vital role in the Indian Economy. As of 2011, India had a large and diverse agricultural sector, accounting, on average, for about 16% of GDP and 10% of export earnings. India's arable land area of 159.7 million hectares (394.6 million acres) is the second largest in the world, after the United States. Its gross irrigated crop area of 82.6 million hectares (215.6 million acres) is the largest in the world. In this paper an attempt has been made to role of infrastructural and institutional factors in the recent transformation of agriculture in Solapur District. This study is based on secondary data collected through secondary records. In this drought prone area agriculture production is depend by infrastructural and institutional factors. Thus, the analysis of transformation in food crops and cash crops is immense significant.Spearman's Rank order method is used for analyzes the correlation of food crops and cash crops. The correlation between food crops and cash crops in Solapur district isr=0.40. It is medium positive correlation. Such type of study represents real situation of cropping pattern in Solapur District and helps to planners, agricultural scientists and research scholars. on on tourist locations can be embedded in the GIS.

KEYWORDS: Transformation, infrastructural, institutional,

INTRODUCTION

Agriculture is the backbone of Indian economy, inspite concerned efforts towards industrialization in last



few decades. Agriculture contributes a maximum contribution of net domestic product by sectors in India. Farmers are growing numerous of crops in the field rather than single crop. The history of agriculture in Solapur district reveals that famine is of common occurrence from ages due to inadequate and ill distributed rains. Partial and complete failure of both Kharif & Rabi crops result in famine. And as such Solapur District was identified as one of the 72 districts in India's drought prone area. The rivers like Bhima, Sina, Man, Nira, Bhogawati and many other smaller tributaries drain in the district. The soil of the district is mainly of Deccan Trap Volcanic origin. It is underlined by partially decomposed Basaltic rock material locally known as "murum". The underline basalt on disintegration and decomposition brought varieties agencies had yielded three kinds of soils viz. Deep black, medium deep & shallow soils. The district is provided with Bhima right bank canal and Neera and Man left bank canals. Similarly Sina and Bhogawati are two seasonal rivers at north side of the district.

Apartfrom physical factors, the infrastructural and institutional factors have strongly influenced in the India as well Solapur district agriculture, bringing about a remarkable transformation. Changes and improvements in infrastructural and institutional factors have given the agriculture a modern outlook, enabling it to change from underdeveloped subsistent type to commercial and market oriented intensive agriculture production system.

STUDY REGION:

The present study deals with how institutional and infrastructural factors are responsible for agriculture in Solapur district. The Solapur district is bounded by 17°05' N to 18° 32' N latitudes and 74° 42' E of 76° 15' E longitudes. The total geographical area of Solapur district is 14845 sq.km. divided into eleven tahsils. The Population is 4,315,527in eleven tahsils of district (Censes2011). It is bounded from the North by Osmanabad district and Ahmednagar district, on the North-East by Satara district and at the South& East it has common boundary of Karanataka state.



Map No.1

Objectives: The present study has been undertaken with the following specific objectives. 1.To find out the role of infrastructural and institutional factors in the recent transformation of

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agriculture in Solapur District of Maharashtra. 2.Impact of food crops on cash crop productivity in Solapur district.

DATABASE AND METHODOLOGY:

Present study mostly relies on the secondary data collected through Agriculture Department, District statistical Department and District socio-economic abstract of Solapur district from 1990-91 to 2012-13 and Gazetteers. To analyze change of crop production, the some techniques are used for calculation. The Spearman's Rank Order method is used for analyzes the correlation between cash crops and food crops in 2012-13.

Formula:-

Spearman's formula $r = 1-6 d^2/n(n^2-1)$

Explanation:

Solapur is one of the popular districts due to highest proportion of sugar industries in Maharashtra. But some time the many factors are responsible for the development of agriculture. Some of the factors are responsible for transformation of agriculture in this district. These factors are as follows-

(A) Infrastructural Factors:

It is because of developments in infrastructural factors that the previous dependence of one crop farming to double cropping has been replaced by multiple cropping patterns which have led India to become self-sufficient in food grain production. These factors include irrigation, fertilizers, seeds, insecticides/pesticides, farm machinery and financial institutions etc.

1. Irrigation:

Irrigation assumes much importance in view of scanty rainfall in many parts of the Solapur district, erratic rainfall elsewhere and failure of monsoon in some years. Irrigation not only helps to extend the next sown area in areas of inadequate rainfall but it also promotes multi-cropping by making it possible to raise a second crop in the dry season. The irrigation land also shows much higher crop yield than unirrigated land. Expansion of irrigation facilities along with other infrastructural factors is the main strategy for increasing agricultural production.

Area under irrigation has registered a threefold increase in Solapur district. In 1991 114543 hect. area under irrigation and it is increased by 2.4% of last two decades.

2.Fertilizers:

Fertilizers is a crucial input for increasing the farm productivity and HYV seeds are of no use without fertilizers. High level of plant nutrients is essential to achieve the objectives of increasing farm production through high cropping intensity under multiple cropping programme. Since the adoption of new agricultural strategy in the sixties, the consumption of chemical fertilizers has grown up very rapidly, from 128039 metric tonnes in 1991 to 512538 metric tonnes in 2013in Solapur District. There exists are inter-regional disparity in the consumption of fertilizer.

3.Seeds:

HYV of seeds comprise one of the most important inputs for enhancing agricultural productivity and production. Efficiency of other agricultural inputs such as fertilizers, pesticides and irrigation is largely determined by it. Seed quality is estimated to account for 20-25 per cent of productivity. At present more than four fifth of the total cropped areas under these crops enjoys the facility of HYV seeds. Prior to 60's farmers were using traditional poor quality of seeds which yielded very low returns. High Yielding Variety (HYV) of seeds, introduced under Green Revolution programme, not only help in increasing production by 10 to 20%, but also have some special qualities such as quick maturing, insect/pest resistance, drought resistance etc. Regional disparity in use of HYV seeds is also reflected in agricultural production.

4. Power:

Power is required for irrigation especially in energizing pumpsets and for agricultural operation in many farm equipment's. Consumption of electricity in 1990-91 was 5610 thousand kilowatts and it became 2473430 thousand kilowatts in 2012-13.

Such improvement in the availability of power in the agriculture, although it is still far short of requirement, has led to large scale mechanization of Indian agriculture. In order increase the efficiency and productivity of agricultural operations, cheap and regular supply of farmers should be assured. Already some tahsil electrically boards are facing heavy financial burden due to highly subsidize or almost free electricity to farmers.

5.Agricultural Mechanization:

Use of modern agricultural machines is essential for successful cultivation in agriculture. Raising of 2-3 crops is possible only by applying modern technology. The traditional farm implements like sickle, hoe, wooden plough, bullock cart etc. are more labour intensive and less efficient. Modern machine like tractors, harvesters, threshers, tillers, sprayers, pumping sets etc. are less labour and more efficient. Nowadays the no of tracks are increasing day by day since 1990-91. Now this situation has already improved and the increased mechanization of Indian agriculture in its regional perspective.

6.Agricultural Credits:

Agricultural credits plays a significant role in improving agricultural production and productivity and mitigating the distress of farmers. Indian farmers need credit both for working capital and for investment. Demand for both for short term and long term credit started raising rapidly with the onset of Green Revolution in mid1960's. The peasants need credits for a variety

Sr.		Food crops (in Hect.)		Cash Crops (in Hect)	
No.	Tahsils	1990-91	2012-13	1990-91	2012-13
1	N.Solapur	35644	25859	7321	3736
2	Barshi	77921	51229	22709	25357
3	Akkalkot	67625	52974	32007	39053
4	S.solapur	85813	38557	11946	19480
5	Mohol	76954	38389	17148	12808
6	Mangalwedha	80267	46992	12113	7347
7	Pandharpur	73453	5852	18587	11956
8	Sangola	78161	42328	20416	2510
9	Malshiras	82627	9633	20937	8495
10	Karmala	82841	68587	34531	13987
11	Madha	96289	59405	20649	17495

Table No.1 Solapur District Area under food and cash crops 1990-91 & 2012-13

Source: Socio-Economic Review of Solapur District-1991-92 & 2012-13

of purpose like purchase of seeds, fertilizers, electricity, implements etc. Improved credit facility through co-operatives, commercial banks, regional rural banks and NABARD has transformed the Indian agriculture by freeing it from the exploitative tendencies of money lenders and traders. In 1990-91 the total agricultural credit was 3814 lakh rupees which increased to 7734445 thousand rupees in 2011-12.

(B) Institutional Factors:

Institutional factors signify the particular system under which land is owned and managed. There have a direct bearing on the overall health of the agricultural sector. This is the second important groups of determinants of agriculture in India.

1.Land Reforms:

Two primary objectives of land reforms are (i) to make optimum use of limited land resources so that maximum benefit is drawn from labour and capital input and (ii) fixing the size of land holding and redistributing the surplus land to landless and small farmers so that the actual tiller of the land feels secure and works hard to increase the agricultural production.

a. Abolition of Intermediaries: After independence, by abolishing Zamindari or permanent system, cultivator come in direct contact with the government which gave encouragement to farmers to develop their farm-land, paving the way for the modernization of agriculture. It is clear that the system of intermediaries was deep rooted and prevailed for a pretty long period in agricultural history of India.
b. Tenancy Reform: Before Independence, the British rulers had introduced Zamindari, Ryotwari and Mahalwari system under which cultivation was very common in large parts of this district.

c. Under tenancy cultivation system, small and marginal farmers as well as landless laboures were forced to till the land big landlords because they did not have their own land in sufficient measure. Tenancy reforms, by conferring ownership rights and providing security tenure have brought stability to

agricultural activity.

d. Ceiling and Redistribution: Imposition of ceiling on landholding and distribution of surplus land among the landless labourers was the third most important objectives of land reform legislation in India. Ceiling is as effective measure for redistribution of land and thereby achieving the goal of economic and social justice.

These land reforms have not been able to meet desired result mainly due to socio-economic complexities and resultant social tension, lack of political will power etc. Late Vinobha Bhave's Bhoodan movement of voluntary donation of land by big farmers was a noble attempt towards peaceful socio-economic transformation. Beneficiaries of land reform most of which belong to poorest segment of the society, are being supported by the ongoing development schemes like IRDP, DPAP etc. in order to reap the benefit of security of tenancy.

2. Consolidation of Holding: As mentioned earlier, most of the land holding in India are small and fragmented. This results in large scale wastage of time and energy of the farmers because he has to operate his several small holding scattered in different parts of the village agricultural land. Consolidation of holding means the bringing together in one or two compact block all fragmented plots of land of the village. Consolidation of holding is largely responsible for the good result shown by agricultural mechanization and other modern inputs in some parts of Solapur district.

3.Land Holding: In Solapur district the size of land holding is too small to make it economically viable. Continued fragmentation due to rapid population growth and law of inheritance is a major area of concern, inhibiting optimum development of agriculture, the average size of operational holding in various tahsils are better placed which facilitates the application of modern inputs of agriculture.

4.Updating of Land Records: For effective implementation of land reforms, updating and modernizing the system of land records is essential. During the Eight Five Year Plan it was decided to utilize computer. Aerial surveys and new techniques for keeping revenue records.

Correlation between cash crop and food crops in 2012-13:

The Spearman's Rank Order method is used for the calculation of the correlation between food crops and cash crops in Solapur district. It is observed that there positive correlation i.e. r = 0.40 between the food crop and cash crops in Solapur District. There are the some reasons for positive correlation i.e. use of tractors, use of modern technology in agriculture, change of agricultural system, use of drip irrigation, use of hybrid seeds etc.

CONCLUSION:

Thus these infrastructural and institutional factors have transformed the nature and characteristics of agriculture in Solapur district to a great extent. Agriculture was in deplorable condition characterized by old unscientific farming methods and very little use of modern techniques, improved seeds, fertilizers, pesticides, machineries, etc. Agriculture was of subsistent type with predominance of food crops in fifties. The new agricultural strategy of 1967-68 envisaged concentration of modern inputs with improved infrastructural and institutional conditions in certain selected high potential areas. Some part of Solapur district led to phenomenal increase in agricultural production, popularly known as Green Revolution. This enabled agriculture in Solapur district to change from subsistent to commercial and market oriented, creating more employment opportunities, strengthening agriculture-industry linkages and encouraging higher adoption of agricultural innovations. Stagnant agriculture has been transformed into progressive agricultural system having a modern outlook. This recent transformation is still in progress with the newer developments in science

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and technology and increased cooperation in a globalised world. This transformation comprises some negative aspects also like increased regional disparity in agricultural development, inter crop imbalances, ecological problems etc. which need to be addressed sincerely.

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