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3. Impact of Irrigation on Levels of Agricultural Technology of Western Maharashtra: A Geographical Analysis

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Abstract

The developments in irrigation are always regarded as stimulant to modernize agriculture. Such modernization takes place only when the farmers can afford themselves to invest in the process of development of agriculture. The ability of farmer to invest in agricultural sector has been determined by irrigation as it promotes income level. Mechanization of agriculture is the essential characteristic of irrigated areas. An assured irrigation, therefore, paves the way for mechanization.

The mechanization of agriculture is the labor saving input. It further refers to use of improved implements with the application of new farm technology (mechanization) agricultural productivity has shown marked improvements. (Patil P.V. 2002) In India technological variables have made a significant impact on both agricultural pattern and agricultural productivity. This has been happened during the period of new technology in dry areas. (Jasbir Singh, 1984). It is observed that irrigation and Modern inputs, such as farm implements high yielding varieties and chemical fertilizer have played as the key factors affecting the agriculture. Further, regional inequalities in the level of agricultural technology are responsible for regional imbalances in the level of agricultural performance. Therefore, the need arises for measuring and mapping the regional inequalities to identify backward and advanced areas in terms of agricultural technology, which are responsible for agriculturally prosperous and backward area. (Patil P.V.2002) In the succeeding analysis an attempt has been made to examine the spatial aspects of the level of technology in agriculture in Western Maharashtra.

Key Words: Agricultural Technology, Agricultural performance, Co operative

Introduction

In India technological variables have made a significant impact on both agricultural pattern and agricultural productivity. This has been happened during the period of new technology in dry areas. (Jasbir Singh, 1984). It is observed that irrigation and Modern inputs, such as farm implements high yielding varieties and chemical fertilizer have played as the key factors affecting the agriculture. Further, regional inequalities in the level of agricultural technology are responsible for regional imbalances in the level of agricultural performance. Therefore, the need arises for measuring and mapping the regional inequalities to identify backward and advanced areas in terms of agricultural technology, which are responsible for agriculturally prosperous and back ward area. (Patil P.V.2002) In the succeeding analysis an attempt has been made to examine the spatial aspects of the level of technology in agriculture in Western Maharashtra.

Objectives

The Present research paper is Impact of Irrigation on levels of agricultural technology Western Maharashtra: A Geographical Analysis

Database & Methodology

The present research paper is based on Secondary sources of data mainly collected from districts census Hand books, Socio-Economic abstracts. Impact of Irrigation on agricultural technology has also been attempted by overlapping the map of the levels of technology on the map showing the levels of agricultural technology at tehsils level. For the computation of the levels of technology the equation evolved by Dutt and Sen Gupta (1969) with further modified by Jasbir Singh (1994) is employed here and composite index values have been derived.

The equation is as under –

$$I_{te} = \frac{I_c}{I_r} + \frac{T_c}{T_r} + \frac{Toi_c}{Toi_r} + \frac{Poi_c}{Poi_r} + \frac{F_c}{F_r} + \frac{P_c}{P_r}$$

Where,

- I_{te} - implies the composite index of the level of agricultural technology.
- I - means percentage of irrigated area to total cropped area.
- T - Abbreviates tractors per 1000 hectare of cultivated area
- Toi - means Tractor Operated implements per 1000 hectare of cultivated area

- Poi - denotes power operated implements per 1000 hectare of cultivated area
- F - Stands for fertilizer consumption per 1000 hectare of cultivated area
- P - Means pesticide consumption per 1000 hectare of cultivated area

e and r subscripts symbolize respectively the tehsils and the entire region districts (Western Maharashtra).

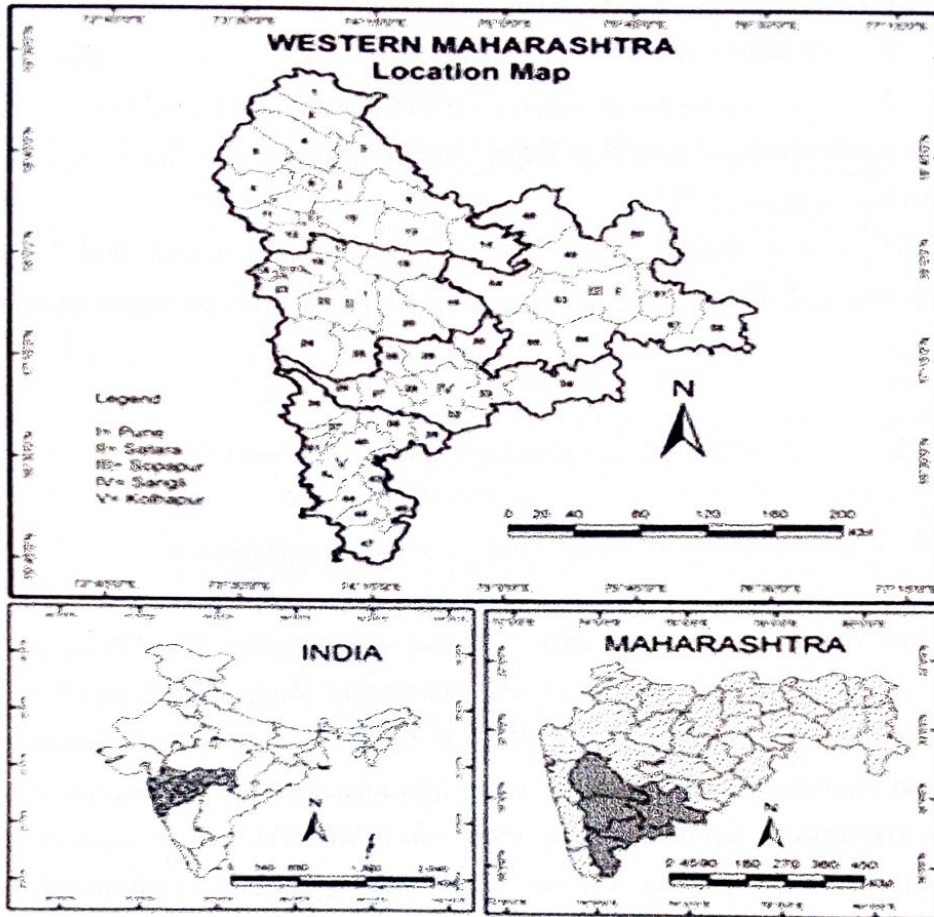
The above procedure is adopted to compute the index value of each tehsil. The summed up index values of all parameters then multiplied by 100 to drive the degree of agricultural technology.

$$\text{Degree of Agricultural technology} = \frac{\sum LQS}{N} \times 100$$

Here N specifies the number of parameters of agricultural technology.

The Region

The Western Maharashtra region is located in Maharashtra State. The Study region western Maharashtra extends between 15° 45' North to 19°24' North latitudes and 73° 19' East to 76° 15' East longitudes. It covers an area of 57235 Sq .Km With comprise five district and 58 tehsils and population of about 23449049 as per 2011 census. The density of population is 347 persons. The region is surrounded by Karnataka state in the south, Konkan region in the west, Nasik in the north and the eastern boundary is surrounded by Aurangabad administrative region of Maharashtra. Fig No 1. Broadly, The Physiographic of the region is uneven in nature. Higher elevation is Sahyadris. The average height of the range is 1300 meters. The highest peak of the region is Kalsubai 1646 Meters. Harishchandra-Balaghat and Shambhu-Mahadev these are the sub ranges of sahyadri, which extends in North-West and South -east direction in the study region. The major river system is Bhima and Krishna. These rivers with their tributaries flow in Southeast direction throughout the region. Sina, Nira, Ghod, Kukdi, Indrayani, Mula, Mutha, are the major tributaries of Bhima .Koyana, Yerla, Warana, Panchganga, are major tributaries of river Krishna. As mentioned earlier the study region comprises of five districts i.e. Pune, Satara, Sangli, Kolhapur and Solapur .There are total 58 tehsils in the Study region. The Solapur, Sangli, Kolhapur, Satara and Pune districts falls in Western part of the Maharashtra State.



Special Pattern in the Levels of Agricultural Pattern in the Levels of Agricultural Technology:

After the calculation the index values for each tehsil the entire region can conveniently be divided into three categories

I. Region of High Level of Agricultural Technology (Over 200 per cent)

It includes the tehsils of above 200 per cent of agricultural technology. The, tehsils namely Indapur, Kagal, Baramati, Pandharpur, Sangola, Mohol, Hatkanagale, Panhala, Karad, Shirol, Phaltan, Palus, Walwa, Karveer, Barshi, Akkalkot, Mahabaleshwar and Pune city tehsils of Western Maharashtra. This zone has been characterized by assured irrigation facilities, substantial development of agro-industries, forward looking attitude of farmer, substantial

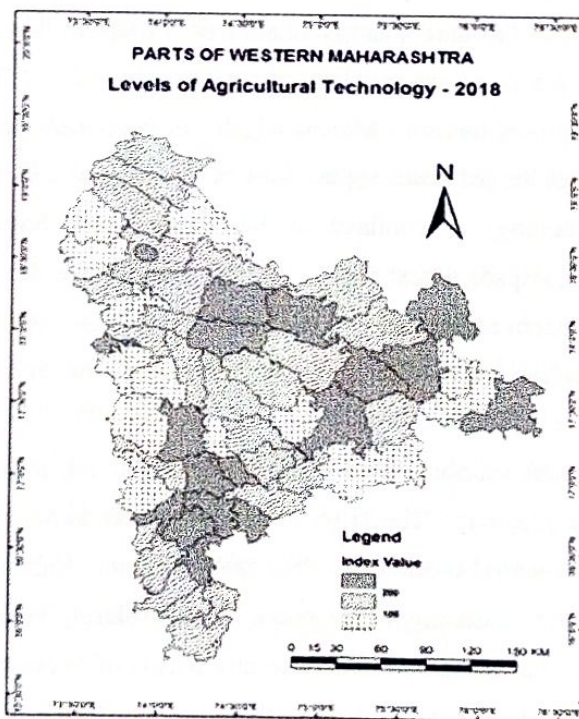
income from grapevine and Sugarcane farming and positive role of co-operatives regarding financial high innovative. All these have led to high level of agricultural technology.

Table .No.1

Regional Pattern of Agricultural Technology in Western Maharashtra

Regions	Index Value	Tehsil
Region of high level of Agricultural Technology	Above 200	Indapur,Kagal,,Baramati,Pandharpur,Sagola,Mohol,Hatkanangale,Panhala,Karad,Shirol,Phaltan,Palus,Walwa,Karvir,Barshi,Akkalkot,Mahabaleshwar,Pune city
Region of moderate level of Agricultural Technology	100-200	Ajara,Khatav,Man,Gadhinglaj,Khed,Koregaon,Kavathemahankal ,Karmala,Chandgad,Purandhar,Bhudargad,Juner,Wai,Daund,Khandala,Haveli,Tasgaon,Radhanagri,Miraj,Shirala,Bavda,Ambegaon,Velhe,Malshiras,Madha,Mangalwedha,Khanapur(vita)
Region of low level of Agricultural Technology	Below 100	Jat,Patan,Jaoli,Satara(tehsil),Mawal,Shahuwadi North Solapur,Atpadi,South Solapur,Shirur,Bhor,Kadegaon,Mulshi

Source – compiled by the researcher 2018.



II. Region of Moderate Level of Agricultural Technology (Between 100 to 200 per cent)

It includes the tehsils (Fig.2) of between 100 - 200 per cent levels of agricultural technology located in central and western parts of the Western Maharashtra. Ajara, Khatav, Man, Gadhihlaj, Khed, Koregaon, Kavthemahankal, Karmala, Chandgad, Purandhar, Bhudargad, Junner, Wai, Daund, Khandala, Havali, Tasgaon, Radhanagri, Miraj, Shirala, Bavda, Ambegaon, Velhe, Malshiras, Madha, Mangalwedha, Khanapur tehsils of western Maharashtra. The tehsils located in central western parts of the region are endowed with the substantial development in irrigation facilities. Besides, in this part the co-operative sector is playing vital role for promoting and introducing the new technology. So farmers are well aware about the new farm technology.

The extreme tehsils of Ajara, Khatav, Man, Gadhihlaj, Chandgad, Purandhar, Bhudargad, Junner, tehsils passes however, exceptional situation. They have low proportion of cultivated land resulted from adverse physiographic conditions. Consequently, the existing agricultural technology shows moderate level of with the cultivated land.

III. Region of Low Level of Agricultural Technology (below 100)

It includes the tehsils of Southern and Northern parts of the region (Table 2 and Fig. 2). This is mainly due to the lack of irrigation and fertilizers. Because of this, farmers in such area are unable to allocate more land under cash crops which can fetch them high income. The dry conditions have discouraged large scale applications of agricultural technology. The lowest level of agricultural technology is confined to Jat, Patan, Jaoli, Satara (tehsil), Maval, Shahuwadi, North Solapur, Atpadi, South Solapur, Shirur, Bhor, Kadegaon, and Mulshi tehsils below 3000 per cent of Western Maharashtra. These tehsils have high variability poor reliability of rainfall. Water is controlling factor to determine level of agricultural technology.

Conclusion

In India technological variables have made a significant impact on both agricultural pattern and agricultural productivity. The High level agricultural technology is 18 tehsils of above 200 per cent of agricultural technology. The tehsils, namely Indapur, Kagal, Baramati, Pandharpur, Sangola, Mohol, Hatkanagale, Panhala, Karad, Shirol, Phaltan, Palus, Walwa, Karvir, Barshi, Akkalkot, Mahabaleshwar and Pune city tehsils of Western Maharashtra. This zone has been characterized by assured irrigation facilities, substantial development of agro-

industries, forward looking attitude of farmer, substantial income from grapevine and Sugarcane farming and positive role of co-operatives regarding financial high innovative. All these have led to high level of agricultural technology. In includes the tehsils (Fig.2) of between 100 -200 per cent levels of agricultural technology located in central and western parts of the Western Maharashtra. Ajara, Khatav, Man, Gadhighlaj, Khed, Koregaon, Kavthemahankal, Karmala, Chandgad, Purandhar, Bhudargad, Junner, Wai, Daund, Khandala, Havali, Tasgaon, Radhanagri, Miraj, Shirala, Bavda, Ambegaon, Velhe, Malshiras, Madha, Mangalwedha, Khanapur tehsils of western Maharashtra. The tehsils located in central western parts of the region are endowed with the substantial development in irrigation facilities. Besides, in this part the co-operative sector is playing vital role for promoting and introducing the new technology. So farmers are well aware about the new farm technology. Remaining tehsils were low levels of agricultural technology.

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