



Impact of Irrigation on levels of Agricultural performance of Western Maharashtra: A Geographical analysis

Dr. Chandrakant Narhari Kale

Abstract

Irrigation plays an important role in minimizing its adverse influence on agriculture. Agriculture stability and development depends on the availability of water for irrigation. Maharashtra state records nearly 15 percent irrigated area of the total cultivated area land as compared to national figure of 18 per cent, Western Maharashtra have 24.46 per cent irrigated area and sharing 7.50 per cent of the total irrigated area. The western Maharashtra region is located in Maharashtra state. It covers area of 57235 Sq km with comprises five district and 58 tehsils and population about 23449049 as per 2011 census. The Major river system Bhima and Krishna. In the analysis primary and secondary data have been used. The study region 5 district Satara, Sangli, Solapur and Kolhapur. The agricultural productivity defined as the level of existing performance of a unit of land which differentiates from one and another. Crop yield percentage of gross cropped area. Selected crops cultivated area. The agricultural performance of high, moderate and low levels of agricultural performance indicating with the help of maps, The present research paper is examined, the impacts of irrigation on levels of agricultural performance in western Maharashtra

Key Word: Agricultural performance, cultivated area, Kilograms

1) Introduction: Agricultural productivity is a function of various factors like physical, socio-economic, technical and organizational. The level of agricultural productivity as a concept means the degree to which the economic, technical and organizational variables are able to exploit the biotic resources of the area for agricultural production (Singh J. 1984). The agricultural productivity is also defined as the level of existing performance of a unit of land which differentiates from one to another (Muhammad Ali, 1979), The differential partly by soil types and climate and partly by the farming techniques. Agricultural productivity is a dynamic in its spatio temporal perspectives. The development of irrigation facilities, mechanization, use of fertilizers and high yielding varieties of seeds adoption of other components of new technology leads to variation in agricultural efficiency per unit of time and space. (Ajagekar B.A., 1988) Being an interdisciplinary study, many scholars from different fields like Economic Agriculture, Geography etc. have evolved different methods to measure the agricultural productivity. The ranking co-efficient of principal crops for a unit of area was used in analyzing and estimating the agricultural efficiency by Kendall (1939), This method was further applied by Stamp (1952) for measuring the agricultural efficiency in India. Shafi (1960), in India did similar work on UP and Deshpande (1964), Refined Kendall's method to same extent. Bhatia (1985) further modified this method. Singh V.R. (1979) has taken into account the yield of crops and their areal spread. Shinde and Jadhav (1978) and Hussain (1976) calculated the agricultural productivity of Maharashtra Plateau and Sutlej Ganga plains in terms of money value of crop production respectively. Sharma and Countino (1976) Vidyanath (1985), Venkateshwara (1988) have also suggested the new methods of measuring agricultural productivity. Ramanaiah and Redeye (1984) analyzed agricultural productivity in Andhra Pradesh

2) Objectives: The Present research paper is examined Impact of Irrigation on the spatial pattern of agricultural performance by which 'weaker areas' can be identified which would be useful in designing proper strategy in agricultural planning. Levels of Agricultural performance of Western Maharashtra: A Geographical Analysis

3) 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 agricultural technology on agricultural performance has also been attempted by overlapping the map of the levels of technology on the map showing the levels of agricultural performance at tehsils level. This kind relationship gives idea of the factors responsible for the emergence of certain level of performance, finally considering other socio economic aspects. The level of agricultural development has been examined which could be useful for paining too. The tehsils wise late indices by employing statistical procedure which are discussed in succeeding pages, In order to assess agricultural performance, Jasbir Singh (1990) method of 'weighted composite level of agricultural performance' has been employed. The technique takes into consideration both the cropland occupancy and productivity of crop for ascertain the level of agricultural performance which have been calculated for each tehsil based on the formula -

$$V_w = \frac{Y_{ae} P_{ae}}{Y_{ar} P_{ar}} + \frac{Y_{be} P_{be}}{Y_{br} P_{br}} + \frac{Y_{ce} P_{ce}}{Y_{cr} P_{cr}} + N = \frac{\sum LQS}{N} \times 100$$

Where,

V_w - denotes weighted composite index of regional inequality in agricultural performance.

Y - Means crop yield of crop 'a' in Kilograms per hectare

P - Implies cropland occupancy of crop 'a' in percentage of gross cropped area.

a, b and c subscripts denote crops considered

e and r subscripts denote tehsils and districts(Western Maharashtra) respectively.

N - Is number of crops holding more than 5 per cent of the total cropped area

LQS - Means location quotients. In the present study Jawar, Bajara, wheat, Rice, Sugarcane etc are selected as they have occupied cultivated area significantly.

The summed up location quotients (LQS) were divided by the number of crops considered in the tehsils and multiplied by 100 to obtain the weighted composite index for the level of agricultural performance. Thus the formula is

$$\text{Weighted composite Level of Agricultural performance} = \frac{\sum LQS}{N} \times 100$$

4) 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.

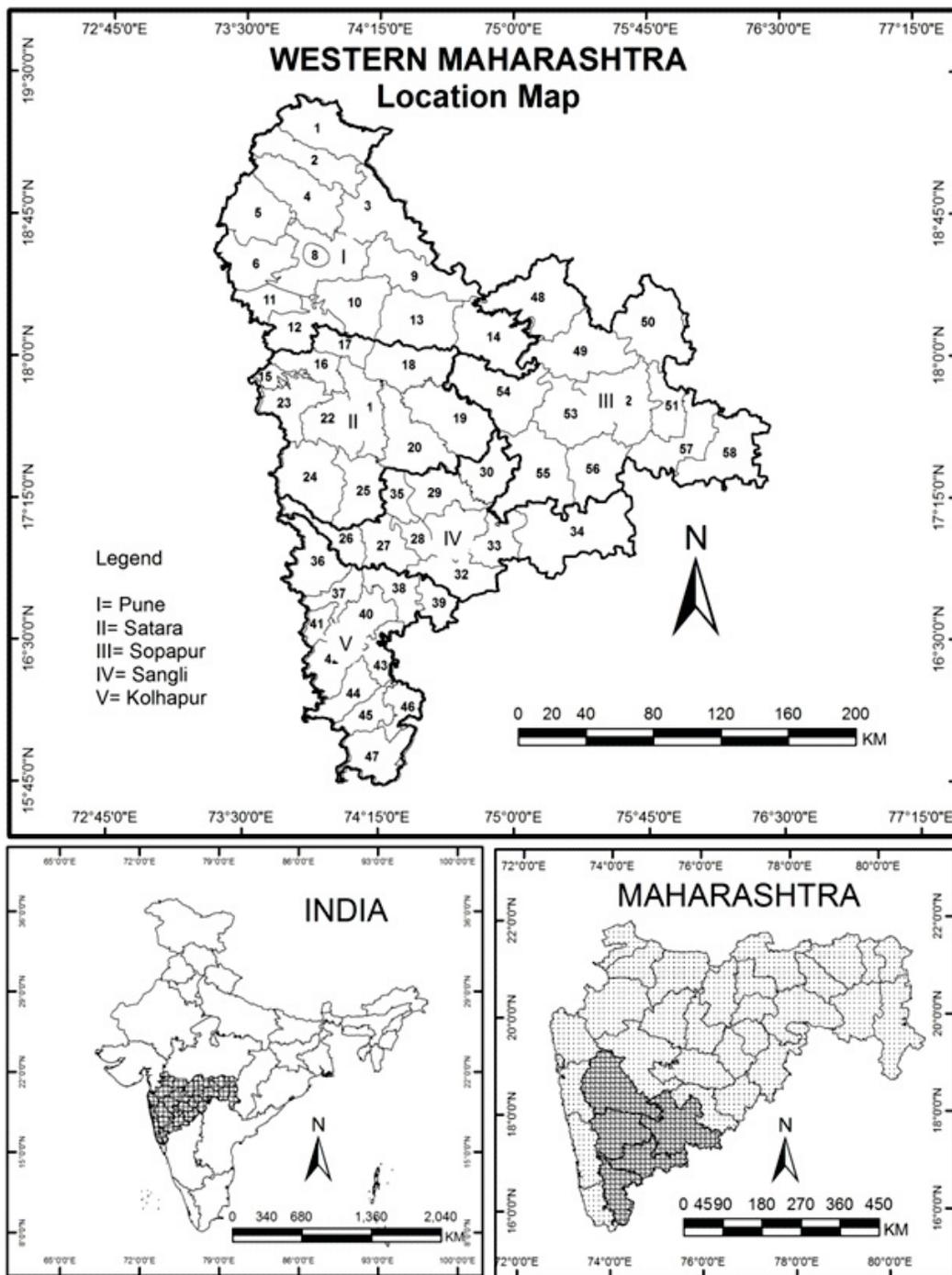


Fig. 1.1

5) Spatial Distribution Regional Pattern of the Levels of Agricultural Performance: The index value in percentage giving the level of agricultural performance for each tehsils the level of agricultural performance of rate during regions. (Fig No, 2) which are given below. I) Region of high level of performance having above 1000 per cent II) Region of Moderate level of performance between 500 to 1000 per cent III) Region of Low level of performance below 500 per cent

I) Region of high level of performance (Above 1000 per cent) :- It includes 12 tehsils located in central part of the region(Table 9.1) .this zone has been characterized by assured supply of water mainly from lift and canal irrigation, dominance of Sugarcane cultivation in tehsils and after all close, network of village levels of agricultural performance Daund, Walwa, Atpadi, Bhudargad, Karmala, Satara(tehsil), Mangalwedha, Madha, Kavthemahankal, Sangola, Pandharpur and Khed tehsils of western Maharashtra, above 1000 per cent of the farming in this zone, is generally carried out scientifically and with commercial attitude recording is dominant in this region and this has led to high level of performance of agriculture.

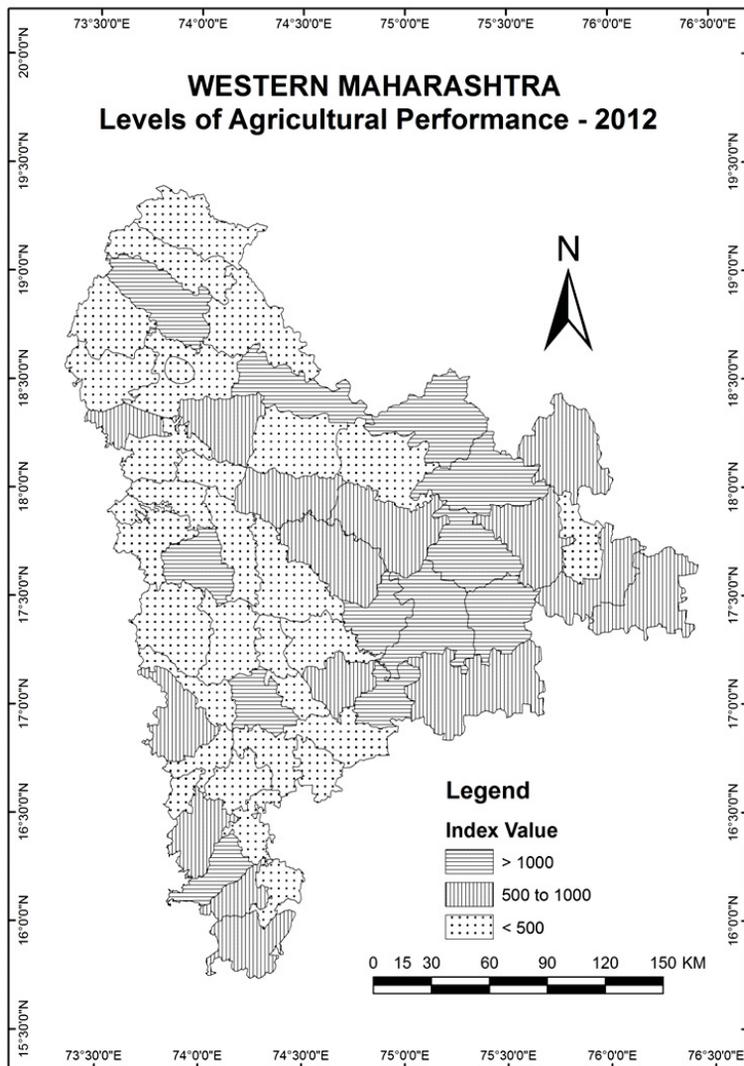
II) Region of Moderate Level of Performance (Between 500 to 1000 per cent):-These regions include 15 tehsils located in central and Southern parts of the region.(Table 1.1) The tehsils located in Southern and Northern parts of the western Maharashtra .The moderate level between 500,to1000 percent levels of agricultural performance Velhe, Mohol, Jat, Man, Malshiras, Chandgad, Radhanagri, Phaltan, Shahuwadi, Barshi, South, Solapur, Purandhar, Tasgaon, Akkalkot and Ajara tehsils are endowed with the relative development in irrigation mainly from wells and canals. Besides in this part the agro-based industries like Sugar Industries are also playing vital role for promoting and introducing the agricultural technology mention may be made of recent expansion of Grapevine cultivation which requires modern technology at substantial level. This has also contributed to the performance of agriculture. The farmers are well aware about the new farm technology leading to moderate level of performance.

Table .No.1 Regional Pattern of Agricultural Performance in Western Maharashtra

Regions	Index Value	Tehsil
Region of high level of Agricultural Performance	Above 1000	Daund,Walwa,Atpadi,Bhudargad,Karmala,Satara(tehsil),Mangalwedha,Madha,Kavthemahankal,Sangola,Pandharpur,Khed
Region of moderate level of Agricultural Performance	500-1000	Velhe,Mohol,Jat,Man,Malshiras,Chandgad,Radhana gi,Phaltan,Shahuwadi,Barshi,SouthSolapur,Purandhar,Tasgaon,Akkalkot,Ajara
Region of low level of Agricultural Performance	Below 500	Khatav,Kahapur,NorthSolapur,Koregaon,Khadala,Karveer,Miraj,Shirol,Maval,Panhala,Gadhinglaj,Maha baleshwar,Mulshi,Kagal,Wai,Karad,Havali,Kadegaon,Junnar,Indapur,Bhor,Ambegaon,Hatkanagale,Bavda,Shirala,Patan,Baramati,Jaoli,Shirur,Palus, Pune city

Source – compiled by the researcher based on the field work 2014.

III) Region of Low Level of Performance (Below 500 per cent): It includes 31 tehsils of Eastern, central and Northern parts of the region (Table, NO 1). Khatav, Kahapur, North Solapur, Koregaon, Khadala, Karvir, Miraj, Shirol, Maval, Panhala, Gadhinglaj, Mahabaleshwar, Mulshi, Kagal, Wai, Karad, Haveli, Kadegaon, Junnar, Indapur, Bhore, Ambegaon, Hatkanagale, Bavda, Shirala, Patan, Baramati, Jaoli, Shirur, Palus and Pune city tehsils of western Maharashtra is index value low because of poor reliability of rainfall. The seasonal nature of well irrigation inadequate water supply and low level of agricultural technology (below 500 per cent) have led to low productivity of land. The lowest level of agricultural performance with 100 per cent is confined to Pune city and Palus tehsils. Besides Pune Tehsil located in urban area and Palus tehsils on the Krishna River have been characterized by excess use of water and over doses of fertilizer performance. Thus these tehsils are suffering from manmade problems due to which thousands of hectares of valuable irrigated land is degraded possessing poor performance of agriculture. Table 1, Fig 2



6) Conclusion: Agricultural productivity is a function of various factors like physical, socio-economic technical and organizational. The level of agricultural productivity as a concept means the degree to which the economic cultural, technical and organizational variables are able to exploit the biotic resources of the area for agricultural production

The High level of Agricultural performance in the 12 tehsils located in central part of the region (Table 1). This zone has been characterized by assured supply of water mainly from lift and canal irrigation, dominance of Sugarcane cultivation in tehsils and after all close network of village levels of agricultural performance, Daund, Walwa, Atpadi, Bhudargad, Karmala, Satara (tehsil), Mangalwedha, Madha, Kavthemahankal, Sangola, Pandharpur and Khed tehsils of western Maharashtra. Above 1000 per cent of the farming in this zone, is generally carried out scientifically and with commercial attitude recording is dominant in this region and this has led to high level of performance of agriculture.

Referances:

- ◆ Ajagekar B. A. (1988): Irrigation in Upper Vedganga Basin: A Geographical Analysis, Unpublished M.Phil Dissertation Submitted to the Shivaji University, Kolhapur, Pp-102-103.
- ◆ Bhatia S.S. (1965): Patterns of Crop Concentration and diversification in India Economic Geography, Vol. 41, Pp-40-56
- ◆ Dutta A.K. and Sen Gupta R. (1969): An Assessment of Agricultural Development in West Bengal, The Journal of Tropical Geography, Vol.128, Pp 17-22.
- ◆ Hussain M. (1976): A New Approach to the Agricultural Productivity Regions of the Sutlas-Ganga Plains of India, Geographical Review of India, Vol 38, Pp- 230-236.
- ◆ Hussain M. (1976): Agricultural Geography, Inter India Publication, New Delhi P- 116
- ◆ Kendal M.G. (1939): The Geographical Distribution of Crop Productivity in England, Journal of Royal Statistical Society, Vol. 162, Pp 24-28.
- ◆ Mohammad Ali (1978): Studies in Agricultural Geography, Rajesh Publication, New Delhi, P -128
- ◆ Patil.P.V. (2002): Geographical Analysis of Agricultural Technology in Sangli Dist, unpublished Ph.D. Thesis of Shivaji University, Kolhapur p-258
- ◆ Rajpatti.Ram (1989): Agricultural Development and Planning in India, Driterion Publications, New Delhi, Pp 1-3
- ◆ Ramanaih Y.V. and Reddy N.B.K. (1984) : Regionalization of Agricultural Productivity in Andhra Pradesh, Transactions, Institute of Indian Geographers, Vol. - 6, No.1 Pp- 1-18.
- ◆ Shafi M. (1960): Measurement of Agricultural Efficiency in U.P., Economic Geography, Vol. 36, No. 4 Pp. 296-305
- ◆ Sharms and Coutiono (1976): Aspect of Agricultural Productivity of Karnataka, The Deccan Geographer, Vol. XIV, No. Pp- 10-22.
- ◆ Shinde S.D. (1980): Agriculture in an underdeveloped Region: A Geographical Survey, Himalaya Publishing House, Bombay.
- ◆ Shinde S.D., Jadhav M. G. and Pawar C.T. (1978): Agricultural Productivity in Maharashtra Plateau: A Geographical Analysis, National Geographer, Vol. XIII No. 1 Pp- 35-41
- ◆ Singh Jasbir, Davinder Singh Sandhu and Jai Prakash Gupta (1980): Dynamic of Agricultural Change: An Agricultural Atlas of India, Oxford and IBH, New Delhi, Pp- 292-293.
- ◆ Singh Jasbir and Dhillion S.S. (1984, 1994): Agricultural Geography, Tata McGraw Hill Publishing, Delhi.

***Dr. Chandrakant Narhari Kale**

Assist Professor

Karmaveer Bhaurao Patil Mahavidyalaya
Pandharpur. (Autonomous)