Agricultural Efficiency in Purna Watershed of West Vidarbha Region

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Abstract

India is an agricultural country and the majority of the population is engaged in agriculture and agribusiness. The soil in each region is of different types and the cropping pattern is found accordingly. Saline belt is found in many parts of India. There is a difference in agricultural efficiency between the saline belt and the non-saline region. The saline belt is found in the entire basin region on both sides of the river. There is a difference between the agricultural practices and the efficiency of agriculture in this region and in the whole region. The present paper studies the agricultural efficiency of the entire Purna river basin in the state of West Vidarbha in the state of Maharashtra as well as in the saline region.

Keywords: *Purna watershed, salinity region, agricultural efficiency, change*

Introduction

Agricultural efficiency is the ratio of unit area production with total area production and denotes the efficiency of agricultural productions compare to their cultivation land. It plays a vital role to the development of agriculture. Present paper reveals the agricultural efficiency in total and salinity zone of Purna watershed, also the change in efficiency.

Objectives

The specific objectives of the present research paper as follows,
i)   To calculate and analysis the agricultural efficiency in total and salinity zone of Purna watershed
ii)   To study the change in agricultural efficiency in total ans salinity zone of the study region.

Data Source and Research Methodology

The present discussion is based on the both source of data primary and secondary, but the main emphasis on secondary source of data. Secondary data is complied from Socio-economic reviews of respective districts, District Census, Crop and Season Reports of Agriculture. Primary source of data is complied from spot investigation by field survey in salinity zone of the study region. Agricultural efficiency is calculated with the help of Ganguli's (1938) method with the help of following formulas,

$$En = Iyn \times Cn \div 100$$

Where, En - Agriculture efficiency,

Iyn - Yield of Crops,

Cn - Crop land share in percentage

$$Iyn = (Yi \div Yn) \times 100,$$

Where, Yi = Production ÷ Area, Yn = Total Production ÷ Total Area

$$Cn = (Area \div Total\ Area\ ) \times 100$$

The analysis is based on the data year 1990-91 and 2010-11. The calculated values are arranged in table and results are shown the map of the region.

Study Area

In the present paper, only the region coming under the area of West Vidarbha in the state of Maharashtra is considered. The agricultural efficiency of the entire region as well as the saline region has been studied. Purna river flows from middle of the study region near about 246 km. The geographical expansion of the study region is 20^0 10' N to 21^0 30' N latitude and 76^0 E to 77^0 56' E longitude. East-west length is 185 km and north-south length is near about 120 km. Geographical area of the study region is 15662.74 sq.km and it is 5.09% of Maharashtra state. The total population in the study region is 5464059 and density is 314 persons in per sq.km according to the census 2011. There are total 29 tahsils are included in the study region fo Amravati, Akola, Buldhana and Washim district (Table No 1).

Agricultural Efficiency of Total Region (1990-91)

Agricultural efficiency is the very much similar to the agricultural productivity. Generally it is said that efficiency and productivity is the two sides of one coin. The higher efficiency index denotes higher development and lower vise versa. Productivity index shows the ratio of cultivation and per yield production and efficiency index denotes the efficiency of productions to the cultivated land. There is no agricultural land included of Chikhaldara tahsil in Purna watershed; therefore the efficiency index of this tahsil is shown an empty in the table.

In 1990-91 the highest agricultural efficiency index was found in Daryapur (6.45) and Akola (5.14) tahsil. Daryapur tahsil had found moderate productivity and high efficiency; it means the production of this tahsil was not enough compare to their efficiency. The moderate efficiency i.e. index in between 4 to 5 observed in Murtijapur, Akot, Telhara, Buldhana, Patur, Mehekar, Barshitakali and Khamgaon respectively (Table No 1). Total remaining 18 tahsils of the region found low agricultural efficiency (Below 4). Sangrampur (1.89), Shegaon (1.79) and Jalgaon Jamod (1.74) tahsil was the lowest index of efficiency in the entire region.

Agricultural Efficiency of Total Region (2010-11)

In the period 2010-11 highest efficiency was recorded in Akola (6.58), Daryapur (5.27) and Murtijapur (5.02). The growth of efficiency index was greater in Akola than Daryapur therefore in 2010-11 Akola had found maximum efficiency index. Murtijapur was the moderate in 1990-91 and this period it found in high category. The overall agricultural productivity of these tahsils was also higher in this period (Figure No 1).

The moderate efficiency (4 to 5) was recorded in Akot, Telhara, Buldhana, Patur, Mehekar, Barshitakali and Khamgaon respectively. These tahsils were also moderate in 1990-91, the efficiency index was increased in 2010-11 but this growth was not enough compare to the agriculture cultivation.

Total remaining 18 tahsils of the region found efficiency index below 4 and same tahsils was also lowest in previous decade. The efficiency index was also increased in these tahsil but their index till not more than 4. Jalgaon Jamod (1.94) was the lowest in the region and it was also lowest in 1990-91. Tahsil wise indices of agricultural efficiency in total region with their district in the year 1990-91 and 2010-11 are shown in table 1.

Table No 1
Purna Watershed: Agricultural Efficiency of Total Region (1990-91 and 2010-11)

Efficiency Index by Ganguli's Method				
Tahsil	**District**	**1990-91**	**2010-11**	**Change**
Telhara	Akola	4.42	4.51	0.09
Akot	Akola	4.44	4.57	0.13
Balapur	Akola	3.77	3.88	0.11
Akola	Akola	6.45	6.58	0.13
Murtijapur	Akola	4.89	5.02	0.13
Patur	Akola	4.31	4.48	0.17
Barshi Takali	Akola	4.22	4.35	0.13
Chikhaldara	Amravati			
Anjangaon Surji	Amravati	2.34	2.49	0.15
Achalpur	Amravati	2.78	2.89	0.11
Chandur Bazar	Amravati	2.69	2.84	0.15
Morshi	Amravati	2.23	2.31	0.08
Amravati	Amravati	2.89	3.03	0.14
Bhatkuli	Amravati	2.59	2.68	0.09
Daryapur	Amravati	5.14	5.27	0.13
Nandgaon Khandeshwar	Amravati	3.78	3.92	0.14
Jalgaon Jamod	Buldhana	1.74	1.94	0.2
Sangrampur	Buldhana	1.89	2.03	0.14
Shegaon	Buldhana	1.79	2.06	0.27
Nandura	Buldhana	3.02	3.16	0.14
Malkapur	Buldhana	2.87	3.01	0.14
Motala	Buldhana	2.22	2.38	0.16
Khamgaon	Buldhana	4.06	4.18	0.12
Mehekar	Buldhana	4.29	4.42	0.13
Chikhali	Buldhana	3.59	3.74	0.15
Buldhana	Buldhana	4.36	4.5	0.14
Malegaon	Washim	3.35	3.51	0.16
Mangrulpir	Washim	3.71	3.87	0.16
Karanja Lad	Washim	2.21	2.36	0.15

Source: - Calculated by Author

Figure No 1
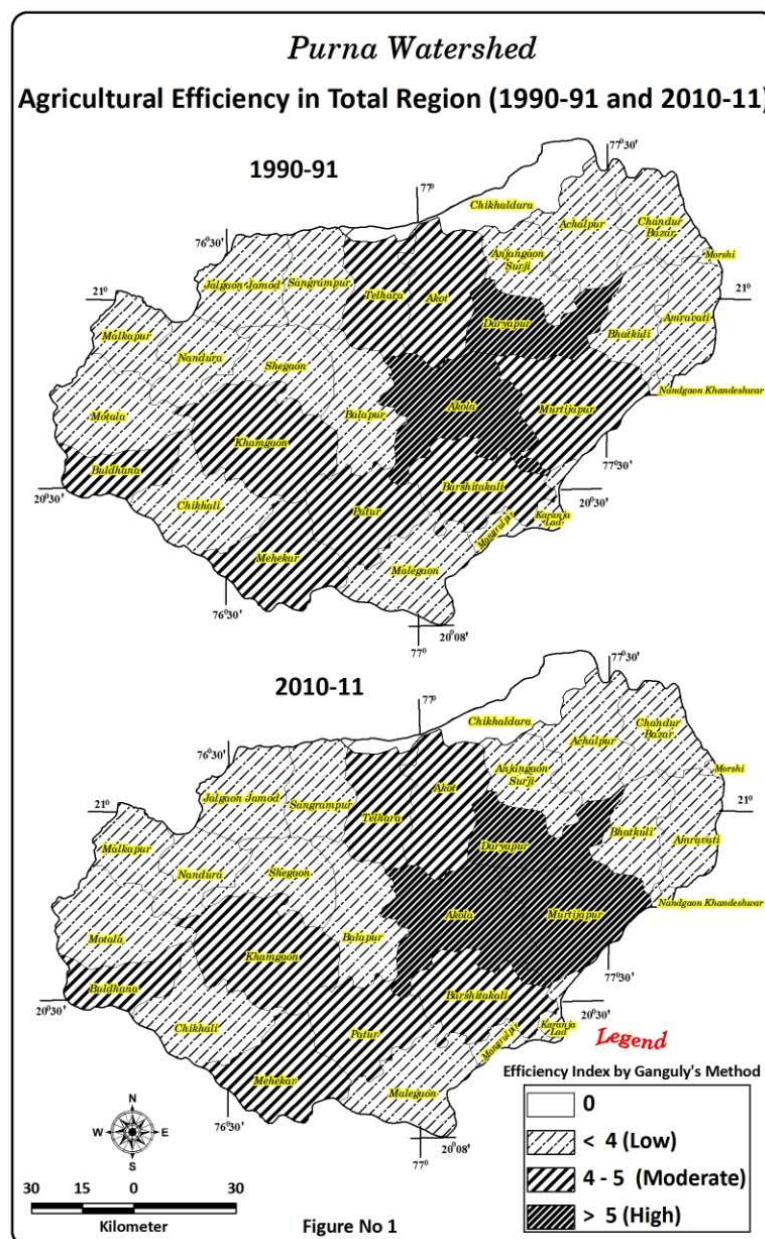
Change in Agricultural Efficiency of Total Region

There are positive changes occurred in agricultural efficiency in every tahsil of the region. Maximum change is found in Shegaon (0.27) and Jalgao Jamod (0.20) tahsil of Buldhana district and lowest occurred in Bhatkuli (0.09), telhara (0.09) and Morshi (0.08) tahsil. In other tahsil this change is found in between 0.11 to 0.18.

Agricultural Efficiency in Salinity Region (1990-91)

In period 1990-91 highest agricultural efficiency index was found in Akola (6.29) tahsil and then in Daryapur (4.96), Murtijapur (4.61), Telhara (4.23), Akot (4.19) and Balapur (3.61) respectively (Table No 2). The moderate index i.e. 2 to 3 found in Nandura, Malkapur, Achalpur, Bhatkuli and Chandur Bazar tahsil respectively.   The low efficiency index was observed in Amravati, Anjangaon, Sangrampur, Jalgaon Jamod

and Shegaon tahsil Jalgaon Jamod (1.62) and Shegaon (1.62) was the lowest in the region. Productivity in Jalgaon Jamod was also low in 1990-91.

Agricultural Efficiency in Salinity Region (2010-11)

The picture of agricultural efficiency in 2010-11 was near about same as 1990-91. In this period Akola (6.32) tahsil was gain found highest efficiency index in salinity region. After Akola the maximum index was found in Daryapur (5.01), Murtijapur (4.69), Telhara (4.34), Akot (4.21) and Balapur (3.69) respectively.

But as compare to the efficiency of these tahsils their productivity was found low and this is the major difference observed in salinity region that the productivity was low than its efficiency due to the lack of knowledge of proper cultivation and proper crops according to the climate and soil of the region.

Table No 2
Purna Watershed: Agricultural Efficiency in Salinity Region
(1990-91 and 2010-11)

Efficiency Index by Ganguli's Method				
Tahsil	**District**	**1990-91**	**2010-11**	**Change**
Telhara	Akola	4.23	4.34	0.11
Akot	Akola	4.19	4.21	0.02
Balapur	Akola	3.61	3.69	0.08
Akola	Akola	6.29	6.32	0.03
Murtijapur	Akola	4.61	4.69	0.08
Achalpur	Amravati	2.59	2.65	0.06
Chandur Bazar	Amravati	2.41	2.49	0.08
Bhatkuli	Amravati	2.43	2.51	0.08
Amravati	Amravati	1.82	1.86	0.04
Anjangaon	Amravati	1.87	1.93	0.05
Daryapur	Amravati	4.96	5.01	0.05
Jalgaon Jamod	Buldhana	1.62	1.67	0.05
Sangrampur	Buldhana	1.71	1.78	0.07
Shegaon	Buldhana	1.62	1.71	0.09
Nandura	Buldhana	2.89	2.95	0.06
Malkapur	Buldhana	2.65	2.72	0.07

Source: - Calculated by Author

The moderate efficiency index was also observed in same tahsils as 1990-91 i.e. Nandura, Malkapur, Achalpur, Bhatkuli and Chandur Bazar (Figure No 2).

Figure No 2
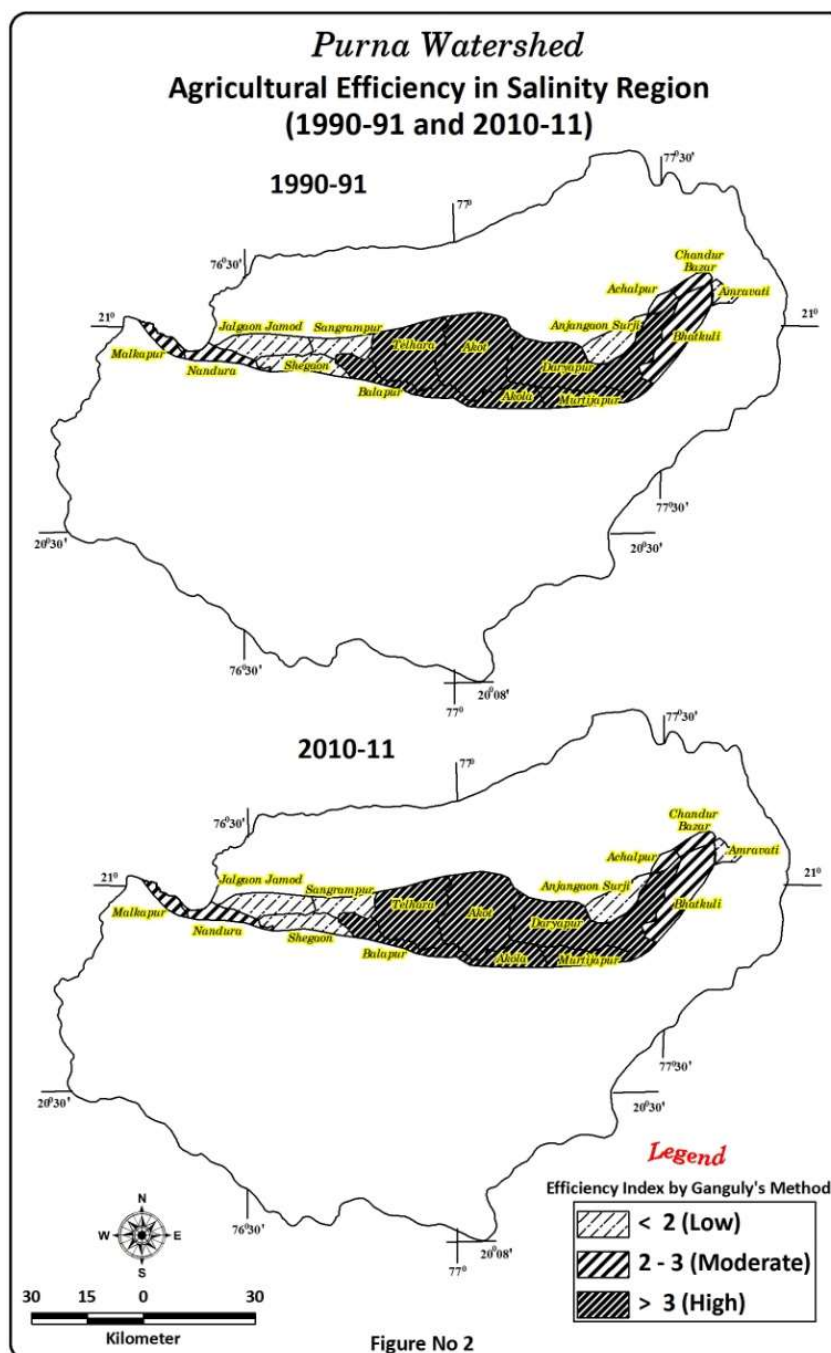
Anjangaon, Amravati, Sangrampur, Shegaon and Jalgaon Jamod tahsil was found the lowest efficiency index (Below 1). Jalgaon Jamod (1.67) was the lowest in the region which was also lowest in previous decade. Productivity of Jalgaon Jamod tahsil in salinity region was also low.   Efficiency index was increased in this period but the share of production was same as previous decade.

Change in Agricultural Efficiency in Salinity Region

Positive changes occurred in agricultural efficiency index but changes are very low in every part of the salinity region. Maximum Change found in Telhara (0.11) tahsil and in other part of the region the change was observed less than 0.10.

Minimum change was found in Akola (0.03) and Akot (0.02) tahsil. Akola tahsil found the highest efficiency index but the positive change was very low during 1990-91 to 2010-11. Also overall agricultural productivity of Akola tahsil was moderate in both years and compare to its efficiency index productivity index was low.

Conclusions and Suggestions

In the study region agricultural efficiency is found to be uneven in total and salinity region. Also in salinity part those tahsils which were high, moderate or low in 1990-91 they were same position in 2010-11 also. The efficiency was increased but the growth was very poor. Lack of proper knowledge about cropping pattern, modern techniques about farming etc are the main reasons to the low development of productivity compare to its original efficiency.

The salinity part of the region is effects on the agricultural efficiency because the index of efficiency is quite lower in salinity region. There are also found difference in general land use and agricultural land use pattern in saline and non-saline region. The fertility of soil in saline region is poor compare to other part of Purna watershed. It is also necessary to leave some agricultural waste land step by step for increasing the soil fertility. Also proper use of fertilizers, proper cropping according to the climate and soil structure of saline zone will increasing the productivity and it helps to the growth of agricultural efficiency in saline region of Purna watershed.

References

1) Dewett, K.K. and Singh, G. (1966), "Indian Economics", Delhi, 1966, p. 66.
2) Ganguli, B. N. (1938), Trends of Agriculture and Population in Ganges Valley, London, Pp. 93.
3) Gudadhe Yeshpal P (2019), "Impact Of Salinity On Agricultural Land Use In Purna Watershed: A Geographical Analysis", Unpublished Ph.D. Thesis, Sant Gadge Baba Amravati University, Amravati, pp 137-138, 160-163.
4) Technical Report Series (2017), "Productivity and Efficiency Measurement in Agriculture", Literature Review and Gaps Analysis, Feb 2017, Improving Agricultural and Rural Statistics, p 10.