

Spatial Analysis and Change in Agricultural Land Use Efficiency in Chandrapur District (Maharashtra State)

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Abstract

Agriculture is the basic occupation of man and the main economy depends on it. Land use plan has a unique importance in agricultural management. Agricultural development is seen in areas where land use is organized and planned. Chandrapur district is the eastern district of Maharashtra state and the agricultural development is moderate. In the present research paper, agricultural land utilization efficiency and its change in Chandrapur district is studied tehsil wise.

Keyword: Agricultural, Land Use Efficiency Index, Change, Gross, Net

Introduction: Agricultural land use efficiency can be defined as the net sown area yield or the proportion of re-cropped area. Gross crop area as a percentage of net crop area provides a measure of land use efficiency (Singh, 1975). Areas with higher agricultural land use efficiency index have higher land use efficiency. Agricultural production and income is influenced by land use efficiency. Present paper reveals the tehsil wise analysis of agricultural land use efficiency and change in Chandrapur district.

Objectives of the Study The main objectives of the present study are as follows,

1. To study and analysis of tehsil wise agricultural land use efficiency in Chandrapur district.
2. To discuss the tehsil wise change in agricultural land use efficiency in Chandrapur district.

Data Source and Methodology

The information used for the present research work is obtained through secondary sources. This information is compiled from District Agriculture Office, Crop and Seasonal Reports and Socio-Economic Reviews. And Pre-published material related to the research topic.

The formula suggested by Jasbeer Singh has been used to calculate the agricultural land use efficiency index in the district. For this the following formula is used,

$$ALUE = \frac{GCA}{NSA} \times 100$$

ALUE – Land Use Efficiency

GCA – Gross Crop Area

NSA – Net Sown Area

Change = Current Year Land Use Efficiency – Last Decade Land Use Efficiency

The analysis presented is based on the data source for the period 2011 and 2021. The statistics obtained by the formula are represented in a table and displayed in a distribution map. Also the change is shown with the help of a graph.

Study Area: Chandrapur district is located in southeast of Maharashtra state. The district lies in between 18° 4' north to 20° 5' north latitudes and 78° 5' east to 80° 6' east longitudes. Total geographical area of the district is 11443 SqKm and stands at 14th number in Maharashtra state about the geographical area. According to the 2011 census total population of the district is 2204307 and out of them 50.98% is male and 49.02% are female population. Gadchiroli district is abounded with Gadchiroli district at east, Yavatmal towards west. Wainganga river makes the eastern boundary of the district.

Agricultural Land Use Efficiency Tehsil wise distribution of agricultural land use efficiency is shown in table no 1.

Table No. 1 Agricultural Land Use Efficiency in Chandrapur District (2011-2021)

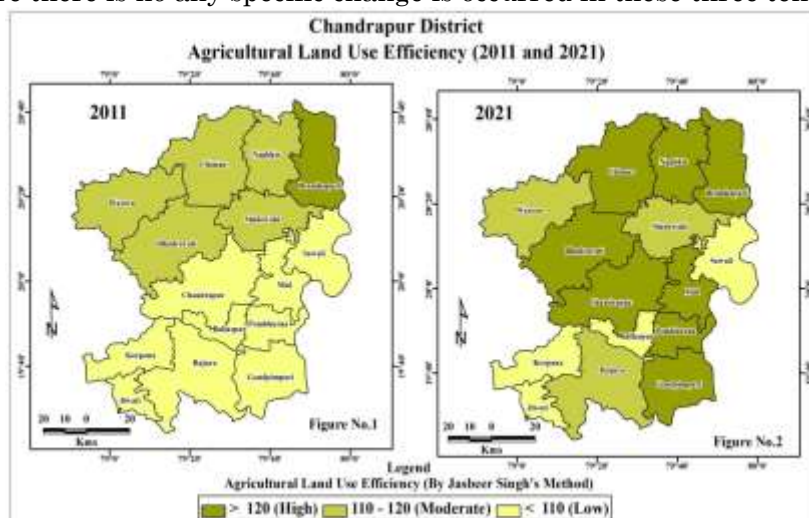
Name	2011	2021
Warora	118.17	115.08
Chimur	111.93	131.74
Nagbhir	113.27	127.17
Brahmapuri	127.13	121.63
Sawali	106.75	103.65
Sindewahi	114.72	118.47
Bhadravati	111.39	130.36
Chandrapur	102.39	123.54
Mul	105.41	120.68
Pombhurna	100.00	124.59
Ballarpur	105.54	103.56
Korpana	100.00	100.00
Rajura	100.00	117.10
Gondpipri	100.57	121.08
Jiwati	100.00	100.00
Total District	109.18	117.61

Source – Agricultural Land Use Efficiency Index is Calculated by Author

The efficiency index is divided into three groups, efficiency index more than 120 is considered as high agricultural land use efficiency, index in between 110 to 120 as moderate and index less than 110 considered as low land use efficiency. Total index of the district is calculated 109.18 in the year 2011 and 117.61 in the year 2021. The growth is found in efficiency index during period 2001 to 2021. This efficiency was low in 2011 and moderate in 2021.

High Agricultural Land Use Efficiency: In the year 2011 only Bramhapuri (127.13) tehsil recorded this index greater than 120 and found the high efficiency of agriculture land use in the district. In the period 2021 Chimur (131.74), Bhadravati (130.36), Nagbhir (127.17), Pombhurna (124.59), Chnadrapur (123.54) Bramhpuri (121.63), Gondpipri (121.08) and Mul (120.68) these 8 tehsils recorded the index more than 120. The index has increased in 2021 due to widening gap between total cropped area and net cultivated area in these tehsils. The index is highest in the Chimur in 2021.

Moderate Agricultural Land Use Efficiency: In the study area total 5 tehsils i.e. Warora (118.17), Sindewahi (114.72), Nagbhir (113.27), Chimur (111.93) and Bhadravati (111.39) found the moderate agricultural land use efficiency. In the year 2021 Sindewahi (118.47), Rajura (117.10) and Warora (115.08) tehsil found moderate efficiency. These tehsils were also moderate in 2011, therefore there is no any specific change is occurred in these three tehsils.



Low Agricultural Land Use Efficiency

Low agricultural land use efficiency is found in 9 tehsils in the year 2011. Out of them Pombhurna, Rajura, Korapna, and Jiwati tehsil found the index exact 100. There is no difference in total crop land and net sown area in these tehsils. Other tehsils like Gondpipri (100.57), Chandrapur (102.39), Mul (105.41), Ballarpur (105.54) and Sawali (106.75) found the index in between 100 to 107. In the year 2021 again Korapna and Jiwati tehsil found this index 100. Ballarpur (103.56) and Sawali (103.65) tehsils found index less than 105. The index of Ballarpur and Sawali tehsil has decreased in 2021 than 2011.

Change in Agricultural Land Use Efficiency: Both positive and negative changes are occurred in agricultural land use efficiency in Chandrapur district during the period 2011 to 2021. Tehsil wise changes are shown in table no

Table No. 2 Change in Agricultural Land Use Efficiency in Chandrapur District (2011 to 2021)

Name	Change (2011 to 2021)
Warora	-3.09
Chimur	+19.81
Nagbhir	+13.90
Brahmapuri	-5.50
Sawali	-3.10
Sindewahi	+3.74
Bhadravati	+18.96
Chandrapur	+21.15
Mul	+15.27
Pombhurna	+24.59
Ballarpur	-1.98
Korpana	0.00
Rajura	+17.10
Gondpipri	+20.51
Jiwati	0.00
Total District	+8.43

Source – Calculated by Author

Positive Changes

The index of total district is increased by 8.43 in 2021 than 2011. The average agricultural efficiency is increased in the entire district. But there is variations are found in tehsil wise changes in efficiency. The maximum positive change is occurred in Pombhurna (24.59) tehsil and then it found in Chandrapur (21.15), Gondpipri (20.51) tehsil. This index is increased by more than 20 in the year 2011. All these three tehsils are found high agricultural land use efficiency in 2011 and growth than 2001. The growth of Chimur (19.91), Bhadravati (18.96), Rajura (17.10), Mul (15.27), and Nagbhir (13.90) is in between 10 to 20. The lowest positive change is found in Sindewahi tehsil i.e. 3.74

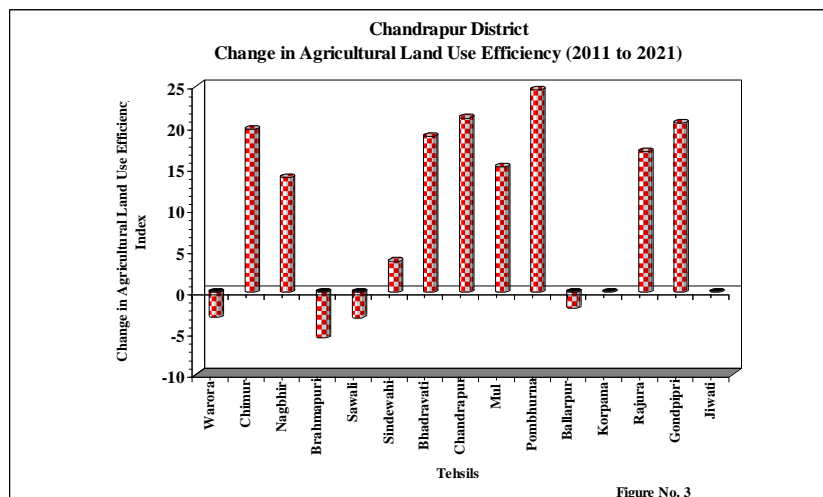


Figure No. 3

Negative Changes

The agricultural land use efficiency is decreased in Ballarpur (-1.98), Warora (-3.09), Sawali (-3.10), and Bramhapuri (-5.50) tehsils. Sawali and Ballarpur tehsils are low in both 2011 and 2021, while Warora tehsil is moderate and Bramhapuri is high. But their index has decreased. This index has decreased due to instability in agricultural land use in these tehsils.

No Changes

There is no change is found in agricultural land use efficiency in Korapna and Jiwati tehsil. Their index is 100 in both decades. Total crop land and net sown area is same in these two tehsils. There is no any improvement is found in the agricultural pattern in this area during the period 2011 to 2021.

Conclusions and Suggestions

Average agricultural land use efficiency has increased in Chandrapur district from 2011 to 2021, but this increase is small. Due to the lack of proper utilization of agricultural land and its planning, there is a difference in this efficiency according to tehsil.

In two tehsils namely Jiwati and Korpana there is no difference between total cropped area and net cultivated area. Therefore, the agricultural land utilization efficiency in this tehsil is found to be stable. In two tehsils, Jiwati and Korpana, due to this, the development of agriculture has also low compared to other tehsils. In Bramhapuri tehsil the efficiency is high in both 2011 and 2021, but in 2021 this efficiency has decreased. A negative change has taken place in this tehsil as the gap between cropped area and net area has decreased. The gap between net area and total cropped area requires proper coordination tools for future development of agriculture.

Agricultural land use efficiency index is increased in Pombhurna, Chandrapur and Gondpipari tehsils. In the year 2011 the efficiency in this tehsil was low and in 2021 it has become high. This is indicative of proper planning of agricultural land in this tehsil.

This has also resulted in increased productivity in areas of Chandrapur district where land use efficiency has declined. It is necessary to maintain a sufficient distance between the total crop area and the net area, and also to keep the suitable agricultural land fallow for some time. Because it will increase the fertility of the agricultural land and increase the agricultural income. For the overall development of agriculture in the district, it is necessary to increase the efficiency of land by spreading new techniques of land use.

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