GEO-EYE

RESEARCH ARTICLE

Agricultural landuse intensity efficiency: A case study of Mandya district

H S Harish[1], A S Rayamane[2]

1 *Research Scholar, Department of Geography, Bangalore University, Bengaluru, Karnataka, India*
2 *Retired Professor & Chairman, Department of Geography, Bangalore University, Bengaluru, Karnataka, India*

OPEN ACCESS

Received: 15.08.2019
Accepted: 22.11.2019
Published: 10.12.2019

Citation: Harish HS, Rayamane AS. (2019). Agricultural landuse intensity efficiency: A case study of Mandya district. Geo-Eye. 8(2): 57-61. https://doi.org/10.53989/bu.ge.v8i2.9

Funding: None

Competing Interests: None

Published By Bangalore University, Bengaluru, Karnataka

ISSN
Print: 2347-4246
Electronic: XXXX-XXXX

Abstract

Agricultural landuse efficiency is a complex and dynamic concept. Any change in socio-economic and agro technology input application brings corresponding change in the efficient utilization of the natural quality and availability of arable land. It represents the degree of optimal use and performance of cultivated as well as cultivable land. The present study is based on secondary source of published data for the years 1991 and 2017 obtained from the statistical magazine of Mandya district. The main aim of the selected study are, to know the landuse intensity efficiency in Mandya district & to analyze the regional disparities of landuse intensity efficiency. Here an attempt is made in the present study to know and find the agricultural landuse by adopting Kendal's Ranking Co-efficient method by taking six variables and the results has been interpreted and presented in the form of Choropleth map.

Keywords: Landuse efficiency; Kendal's Ranking; Net sown area

Introduction

A systematic and scientific evolution of agricultural and resources is of paramount importance in regional agricultural landuse planning. The interaction of physical, socio-economic and technological factors determine the efficiency and effective use of agricultural land resource in an area to a great extent.

Agricultural landuse efficiency is a complex and dynamic concept. Any change in socio-economic and agro technology input application brings corresponding change in the efficient utilization of the natural quality and availability of arable land. It represents the degree of optimal use and performance of cultivated as well as cultivable land.

Therefore, the agricultural landuse efficiency is an integrated system which considers both the spatial spreads of this land resource and the effective ways and means of agronomic practices ranging from single to multiple cropping, extent of irrigation, type of crop etc., of which this resource is being utilized at optimum level. The term efficiency is used here to denote the overall performance and optimum use of agricultural land as manifested by the positive and negative agronomic level by bringing harmony among the physical, socio-economic and technological factors.

Since the evolution of the efficiency of agricultural land is related to different variables, its quantification is very much required to know this concept into more tangible. Comprehensive, precise and objective, quantification of agricultural landuse efficiency provides a conceptual framework and objective measures to examine the degree of efficiency that the land with certain natural characteristics under a given technological level and socio-economic setup is put to optimum use.

In agricultural landuse efficiency study, a modified Kendall's ranking coefficient method which is otherwise designated as the standard coefficient method of Reddy (2002) is employed to evaluate the agricultural landuse efficiency in Andhra Pradesh. Kendall (1939) has developed a measure to determine agricultural efficiency based on crop yield levels and devised a system of ranking coefficients. Kendall's Ranking Co-efficient method is applied to measure the landuse efficiency of Mandya district by taking five variables, by selecting different variable of agricultural landuse, namely.

1. Net Sown Area
2. Area Sown more than once
3. Irrigated land
4. Non- Cultivable land
5. Cultivable waste for calculating the rank co-efficient

Here the first three variables are positive and the last two are negative variables. In assigning ranks, the first rank is given to the highest percentage in the case of positive variables while it is given to the lowest percentage in the case of negative variables.

Finally, the given ranks of both the positive and negative variables of a component area unit are added and averaged to obtain the ranking coefficient. The degree of landuse efficiency of a component areal unit is determined on the basis of the ranking co-efficient thus obtained. The obtained ranking coefficient are inversely related to the degree of landuse efficiency i.e., higher co-efficient lower the agricultural efficiency vice-versa.

According to Reddy (1985) the Kendall's ranking coefficient method suffers from certain short comings. In order to eliminate or minimize such short comings of the ranking coefficients method a modified method designated as standard coefficient method is suggested by them. Instead of assigning ranks, the actual percentage of the variables of a particular component areal unit are added and averaged. The average value of the variables of a component areal unit obtained is the standard coefficient and denotes a level of efficiency. In resolving the problem of positive and negative variables the percentage of each variable is converted into a standard value. In the case of positive variables the higher percentage of each variable among all the areal units will be 100 and it is the maximum standard value that can occur. With reference to this maximum standard value, the percentages of the variable of the remaining area units are computed proportionately to obtain the respective standard values. In the case of the negative variables, the least percentage of the negative variable is assigned a standard value of 100 with reference to this maximum standard value. The percentage of the variable as the remaining areal units are computed to obtain the respective standard values. It may be noted here that as the percentage of the negative variable increases the standard value decreases.

Study area

Mandya District is part of Mysore plateau in the South Indian Peninsula. The District lies between 76° 19' and 77° 20' East Longitude and 12° 13' and 13° 04' North Latitude. It is bounded on the North by Hassan and Tumkur district, on the east by Tumkur and Bangalore districts, on South by Mysore district and on the West by the Hassan and Mysore District. Mandya district has seven taluks namely, Nagamangala, K.R. Pet, Mandya, Malavalli, Maddur, Pandavapura & Srirangapatanna.

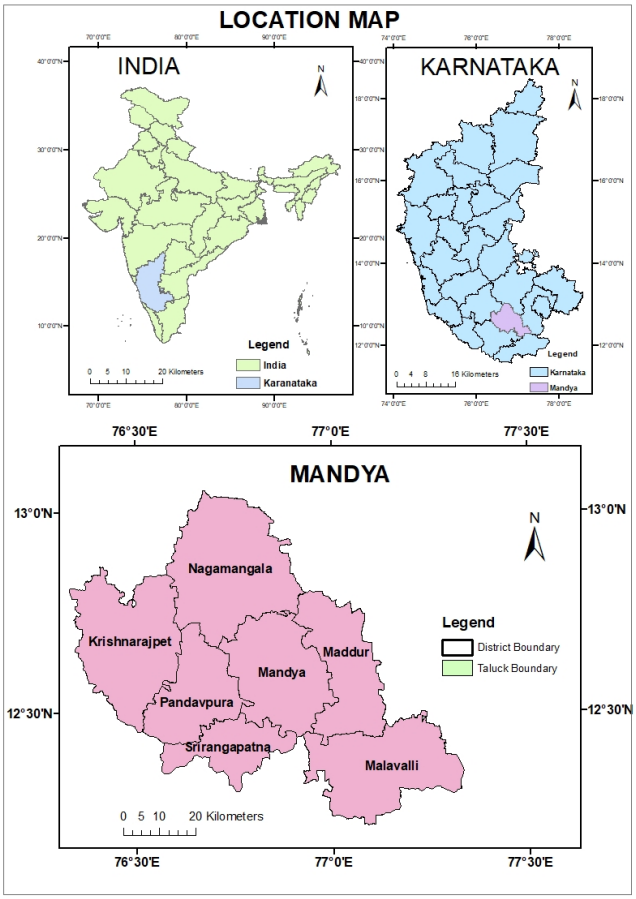

Fig. 1. Study area

Objectives

The main aim of the selected study are,

- To know the landuse intensity efficiency in Mandya district.
- To analyze the regional disparities of landuse intensity efficiency

Methodology

Here an attempt is made in the present study to know and find the agricultural landuse by adopting Kendal's Ranking Co-efficient method by taking six variables namely

- Net sown area
- Area sown more than once
- Irrigation intensity
- Cultivable waste
- Fallow land
- Waste land

The results have been interpreted and presented in the form of Choropleth map.

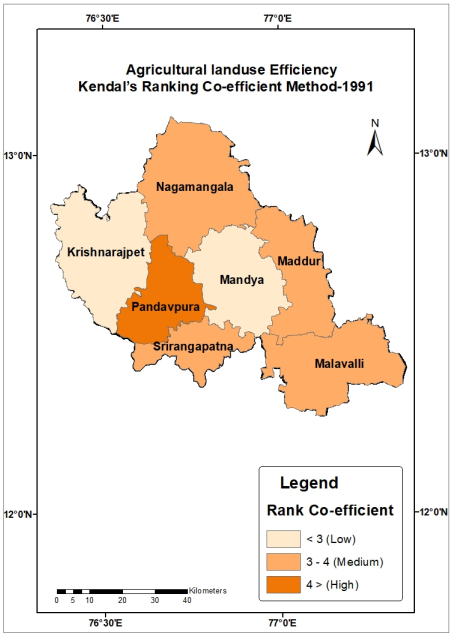

Fig. 2. Agricultural Landuse efficiency in Mnadya District-1991

Analysis

High Agricultural landuse efficiency region:

In the district high agricultural landuse efficiency region can be seen in all five taluks except Pandavapura and Sri

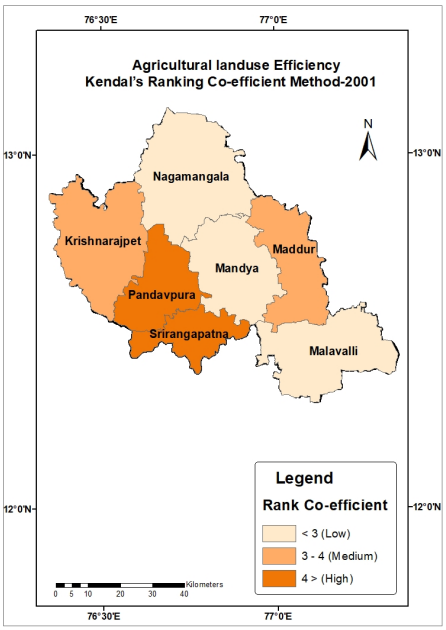

Fig. 3. Agricultural Landuse efficiency in Mnadya District-2001

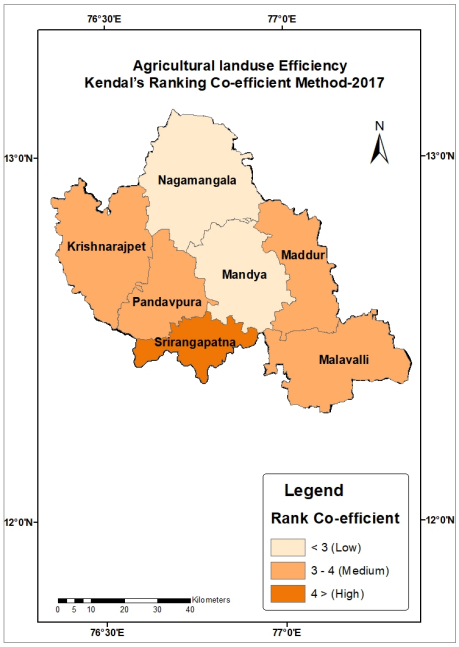

Fig. 4. Agricultural Landuse efficiency in Mnadya District-2017

Table 1. Agriculturallanduse Efficiency in Mandya district by Kendal's Ranking Co-efficient Method (1991)

Sl. No	Taluk	Net Sown Area		Area Sown More than once		Irrigation intensity		Cultivable waste land		Fallow land		Non Agricultural land		Total Rank	Ranking Co-efficient
		Area	Rank	Area	Rank	Area	Rank	Area	Rank	Area	Rank	Area	Rank		
1	K.R. Pet	38890	3	6011	3	43.4	5	6513	2	13913	2	8959	4	19	2.7
2	Maddur	41161	2	5358	4	50.6	3	130	7	1079	7	18486	1	24	3.4
3	Malavall	36254	5	3860	5	43.7	4	2428	3	12306	3	6645	5	25	3.6
4	Mandya	44966	1	9628	1	55.9	2	2320	4	2810	6	8960	3	17	2.4
5	Nagamangala	38772	4	1663	7	7.3	7	26476	1	18644	1	9272	2	22	3.1
6	Pandavapura	22862	6	2709	6	29.1	6	1325	5	12213	4	4757	6	33	4.7
7	Srirangapattana	17874	7	6758	2	63.8	1	500	6	7971	5	3522	7	28	4

Table 2. Agricultural landuseEfficiency in Mandya district by Kendal's Ranking Co-efficient Method (2001)

Sl. No	Taluk	Net Sown Area		Area Sown More than once		Irrigation intensity		Cultivable waste land		Fallow land		Non Agricultural land		Total Rank	Ranking Co-efficient
		Area	Rank	Area	Rank	Area	Rank	Area	Rank	Area	Rank	Area	Rank		
1	K.R. Pet	48646	1	4530	5	41.5	5	6510	2	2429	6	8959	4	23	3.3
2	Maddur	39794	4	8578	1	56.6	3	128	7	2413	7	18537	1	23	3.3
3	Malavall	42245	2	6095	2	42.3	4	2420	4	6333	4	6645	5	21	3
4	Mandya	28560	5	5170	4	68.6	1	2319	5	19219	1	8960	3	19	2.7
5	Nagamangala	42234	3	4097	6	10.1	7	26178	1	15484	2	9272	2	21	3
6	Pandavapura	25598	6	3493	7	39.3	6	3900	3	8967	3	4757	6	31	4.4
7	Srirangapattana	20311	7	5258	3	59.4	2	500	6	5586	5	3664	7	30	4.3

Table 3. Agriculturallanduse Efficiency in Mandya district by Kendal's Ranking Co-efficient Method (2017).

Sl. No	Taluk	Net Sown Area		Area Sown More than once		Irrigation intensity		Cultivable waste land		Fallow land		Non Agricultural land		Total Rank	Ranking Co-efficient
		Area	Rank	Area	Rank	Area	Rank	Area	Rank	Area	Rank	Area	Rank		
1	K.R. Pet	40407	1	7804	3	61.9	6	6510	2	10502	7	9120	4	23	3.3
2	Maddur	30202	4	6350	5	69.3	3	166	7	11687	4	18700	1	24	3.4
3	Malavall	31568	3	4702	7	70.3	2	2420	4	19747	2	6750	5	23	3.3
4	Mandya	33268	2	9459	2	84.6	1	2319	5	16807	3	9650	3	16	2.3
5	Nagamangala	29691	5	6865	4	21.3	7	26178	1	29645	1	10428	2	20	2.8
6	Pandavapura	22185	6	9985	1	66.9	5	3900	3	11321	5	4940	6	26	3.7
7	Srirangapattana	14057	7	4950	6	69.4	4	500	6	11203	6	3904	7	36	5.1

rangapattana. But in 2017 pandavapura taluk also converted into high agricultural landuse efficiency region with 3.7 ranking co-efficient.

The favourable geographical and agronomic conditions in relation to agricultural landuse are prevailing in this region but with little variables. This region is also considered to be the must productive and stable region in terms of agriculture landuse development. These regions have a limited scope for further improvement of the optimal returns.

In 1991, Mandya taluk is first in net sown area and first in area sown more than once. It has high intensity of irrigation and ranks second, third position in non agricultural land, fourth position in cultivable waste land and 6th position in fallow land. Almost same thing is maintained in 2001 & 2017.

Medium Agricultural Landuse Efficiency Region:

The medium agricultural landuse efficiency are found in Srirangapattana and Pandavapura taluk in 1991 and 2001 but in 2017 Pandavapura taluk converted into high agricultural landuse efficiency region. However, most of these taluks has plain and undulating plain topographical condi-

tions favourable for agriculture, better protective irrigational facilities particularly tank and well irrigation as well as limited proportion of non-cultivable. Other cultivable and fallow lands this region stands good chances for further improvement in its agricultural landuse efficiency provided protective irrigation facilities are augmented by conjunctive use of surface and sub surface water resources, better soil and crop management is practices and the socio-economic conditioned are improved.

Conclusion

Agriculture landuse efficiency is a complex and dynamic concept. Ny change in socio-economic and agro-technology input application brings corresponding change in the efficient utilization of the natural quality and availability of arable land. It represents the degree of optimal use and performance of cultivated as well as cultivable land. The study highlights the agriculture landuse efficiency regions by adopting Kendal's ranking co-efficient method by taking six variables in Mandya district.

The entire cropping pattern of Mandya district seems to be governed by agro-climatic conditions. Irrigation plays a prominent role by changing the nature and extent of cropping pattern. Thus the development of irrigation in some area particularly tube well irrigation have influenced the choice of cropping. This is due to a number of factors like diversity in weather condition, irrigation development, soils, transport development, agriculture, markets, urbanizations, globalization etc., region has experienced introduction of new horticulture.

References

1) Narain D. Studies on Indian Agriculture. *National Geographical Journal of India*. 1988;37:332.
2) Hussain M. Crop Combination in India- A Study. New Delhi. Concept Publishing Company. 1982.
3) Mukherjee BN. Agricultural Regions of the United Provences Calcutta. *Geographical Review*. 1942;4(1).
4) Singh J. An Agricultural Atlas of India- A Geographical Analysis. Vishal Publisher. 1974.
5) Mandya District at a glance., (2001), Directorate of Economics and Statistics, Bangalore. 2001.
6) Dayal E. Agricultural Productivity in India: A Spatial Analysis. *Annals of the Association of American Geographers*. 1984;74(1):98–123. Available from: https://dx.doi.org/10.1111/j.1467-8306.1984.tb01437.x.
7) Buchanan RO. Some reflection on Agricultural Geography. 1959.
8) Gibbs. Index of Diversification taken from an Introduction to quantitative Techniques in Geography. Oxford Publication. 1962.
9) Bhatia SS. Crop Combination and Diversification". *Economic Geography*. 1965;34:65.
10) Mandya District at a glance., (2017), Directorate of Economics and Statistics, Bangalore. 2017.
11) Hussain M. Crop Combination Region of Uttar Pradesh: A Study". *Geographical Review of India*. 1972;34:134–156.
12) Kendal MG. The geographical distribution of crop productivity in England. *Journals of Royal Statistical Society*. 1939;162:2–3.
13) Gupta SD. Crop Combination regions in India. *Geographical Review of India*. 1966;38.
14) Barakar SB. Analysis of Cropping pattern and crops combination regions in Belgaum division. Dharwad. 2000.
15) Mandya District at a glance., (1991), Directorate of Economics and Statistics, Bangalore. .
16) Weaver JC. Cropping pattern of crops Landuse in Middle East. *Economic Geography*. 1954;30(1):2.
17) Reddy. Landscape Ecological Planning and Management of Anantapur District Andhra Pradesh. *Annals of the National Association of Geographers, India*. 2002;22(2):63–73.
18) Mohammad N, Majeed. Perspective in Agricultural Geography. vol. 9. 1979.