



Matrix of Co-Efficient of Correlation in Different Categories of Land Use in Jalna District 1983 to 2004

PANDURANG B.
ACHOLE

Department of Geography, Azad Mahavidyalaya, Ausa, Dist. Latur (MS)-
413520

ABSTRACT

The nine general land use categories are clubbed into five major categories. Naturally a change in one is followed by a change in another category or all of the remaining categories. To measure the association of the different categories the co-efficient of correlation of each of the category with rest of the categories have been measured.

KEYWORDS: Land use, matrix co-efficient, land use efficiency, sown area,

1. Introduction

Land use means the surface utilization of all developed and vacant land on a specific point, at a given time and space. This leads one back to the village farm and the farmer, to the fields, gardens, pastures, fallow land, forests and to the isolated farmers" (Freeman 1968)¹ as geography deals with the spatial relationship between these aspects and planning. This is because of the land by the society in its new ways and conditions of life. "The demand for new uses of land may be inspired by technological changes, or by a change in the size, composition and requirements of a community. Some changes are short lived, whereas other represent a more constant demand (Jackson, 1963)². A clear understanding of these dynamic qualities in land use will emerge from a historical survey designed to reveal the successive development of inherent characteristics of land.

"Land use is the use made of the land by man, as surveyed and mapped in a series of recognized categories. The primary uses of land are for crops, forest, pasture, mining, transportation, gardening, residential, recreational, industrial, commercial, uncultivable, waste, barren and fallow land, etc. It is not normally possible to use land for two or more purposes simultaneously though sometimes even this is possible i.e., the pastured woodland. In most cases the proportion of waste land is quite large." R.B.Mandal (1990)³

In India many geographers have studied the land use for different regions of our country. MohmmadShafi, (1951), V.R. Singh (1957), C.D. Deshpande (1959), Swaminathan (1984), M.M. Das (1981)⁴ have attempted to study changing land use in different regions of India.

Study Area:

In the present study, an endeavour is made to examine the spatial distribution of general land use, cropping pattern, tahsilwise area under irrigation, tahsilwise agricultural production in Jalna district.

In India the major agricultural problems are in drought prone area. "In India 123, districts of India have been classified as dry land areas with annual rainfall ranging between less than 500mm. to 1500mm. Dry land agriculture accounts for more than 70 per cent of the cultivated area of the country. The yields in dry tracts area low and run risk of a total crop failure as a result of erratic rainfall in Jalna district (N.Sreedhara & P. Venkat Laxi 2007)⁴ one of the district which is included in 123 dry district in India. The farmers are facing many problems in Jalna district. The topography, soils, climatic conditions, tahsilwise irrigational facilities & production are not equal in Jalna district so Jalna district has been selected for the research purpose.

Here in this study what have the changes taken place in different tahsils of Jalna district and how transformations were taken place as per time in Jalna district is covered.

Discussion

There is variation in the correlation of land use categories of Jalna district from 1983-84 to 2003-04. There is negative correlation in land use in Jalna district. There is also negative correlation between area not available for cultivation and other uncultivated land in Jalna district. There is very high grade negative correlation between fallow land and net sown area in Jalna district during the period under study.

There is great variation in correlation of different categories of land use in Jalna district during the period 1983-84 to 2003-04.

In Jalnatahsil, high grade negative correlation have been observed between the area under forest and area not available for cultivation between area not available for cultivation and other uncultivated land, fallow land and net sown area, area not available for cultivation and net sown area in Jalnatahsil during the period under study. There is also positive correlation between area under forest and net sown area in Jalnatahsil during the period under study.

Table No.1 indicates the correlation between different categories of general land use in different tahsils of Jalna district.

Table No. 1 Matrix of Co-efficient of Co-relation in Different Categories of General Land use in Jalna District 1983 to 2004

| Sr. No. | Area Under Forest | Area not available for cultivation | Other uncultivated Land | Fallow Land | Net sown Area |
|---------|-------------------|------------------------------------|-------------------------|-------------|---------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | X | -0.77 | 0.37 | -0.09 | 0.45 |
| 2 | | X | -0.55 | 0.01 | -0.48 |
| 3 | | | X | -0.07 | 0.01 |
| 4 | | | | X | -0.80 |
| 5 | | | | | X |

Table 2 shows the matrix of co-efficient of co-relation in different categories of land use in different tahsils of Jalna district from 1983-84 to 2003-04.

Table No. 2 Matrix of Co-efficient of Co-relation in Different Categories of General Land use in JalnaTahsil 1983-84 to 2003-04

| Sr. No. | Area Under Forest | Area not available for cultivation | Other uncultivated Land | FallowLand | Net sown Area |
|---------|-------------------|------------------------------------|-------------------------|------------|---------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | X | -0.77 | 0.37 | -0.09 | 0.45 |
| 2 | | X | -0.55 | 0.01 | -0.48 |
| 3 | | | X | -0.07 | 0.01 |
| 4 | | | | X | -0.80 |
| 5 | | | | | X |

BhokardanTahsil

| Sr. No. | Area Under Forest | Area not available for cultivation | Other uncultivated Land | FallowLand | Net sown Area |
|---------|-------------------|------------------------------------|-------------------------|------------|---------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | X | 0.15 | -0.17 | -0.04 | -0.04 |
| 2 | | X | -0.34 | 0.08 | -0.38 |
| 3 | | | X | 0.04 | -0.07 |
| 4 | | | | X | -0.94 |
| 5 | | | | | X |

JafrabadTahsil

| Sr. No. | Area Under Forest | Area not available for cultivation | Other uncultivated Land | FallowLand | Net sown Area |
|---------|-------------------|------------------------------------|-------------------------|------------|---------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | X | 0.04 | 0.34 | 0.47 | -0.46 |
| 2 | | X | -0.17 | 0.06 | -0.16 |
| 3 | | | X | -0.23 | 0.25 |
| 4 | | | | X | -0.99 |
| 5 | | | | | X |

AmbadTahsil

| Sr. No. | Area Under Forest | Area not available for cultivation | Other uncultivated Land | FallowLand | Net sown Area |
|---------|-------------------|------------------------------------|-------------------------|------------|---------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | X | 0.49 | 0.15 | -0.27 | -0.08 |
| 2 | | X | 0.36 | -0.27 | -0.37 |
| 3 | | | X | 0.04 | -0.52 |
| 4 | | | | X | -0.75 |
| 5 | | | | | X |

ParturTahsil

| Sr. No. | Area Under Forest | Area not available for cultivation | Other uncultivated Land | FallowLand | Net sown Area |
|---------|-------------------|------------------------------------|-------------------------|------------|---------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | X | -0.58 | -0.38 | -0.09 | 0.50 |
| 2 | | X | -0.12 | 0.34 | -0.77 |
| 3 | | | X | 0.2 | -0.30 |
| 4 | | | | X | -0.81 |
| 5 | | | | | X |

In Bhokardantahsil no positive correlation is observed in any two categories of land use during the period under study. There is very high grade negative correlation between fallow land and net sown area in Bhokardantahsil during the period under study.

In Jafrabadtahsil there is positive correlation between area under forest and fallow land during the period under study. Very high grade negative correlation is recorded in between fallow land and net sown area, there is also negative correlation between area under forest and net sown area in Jafrabadtahsil during the period 1983-84 to 2003-04.

In Ambadtahsil, positive correlation has been observed between area under forest and area not available for cultivation during the period under study.

There is positive correlation between area under forest and net sown area in Parturtahsil during the period 1983-84 to 2003-04. Very high grade negative correlation is observed between fallow land and net sown area, area not available for cultivation and net sown area during the period under study.

Land Use Efficiency :

The proportion of potential cultivable land or fallow land has decreased from 9.60% to 8.23% during the period 1983-90 to 1997-04. Some of the fallow land has been converted in to net sown area. The highest fallow land was recorded in Jafrabadtahsil (12.10%) and the lowest fallow land was observed in Partur 6.92% tahsil during the period 1983-90. In 1997-2004 highest fallow land was noticed in Jalnatahsil and the lowest fallow land was recorded in Ambad (4.72%) tahsil. The horizontal expansion of agriculture in Jalna district is not possible so, it is very necessary to give more increase cropping intensity. Due to less irrigational facilities, low agricultural productivity, risk of crop failure, erratic monsoon rainfall, high water taxing for rural production, it is fruitful to investigate the degree of intensity with which the net sown area is utilized.

The extension of area sowed more than once means the agricultural efficiency. The gross cropped area as a percentage the net sown area gives a measure of land use efficiency and it is known as intensity of cropping.

The index of land use efficiency is calculated with the help of following formula and shown in below maps.

$$\text{Index of Land use Efficiency} = \frac{\text{Gross cropped area}}{\text{Net sown area}}$$

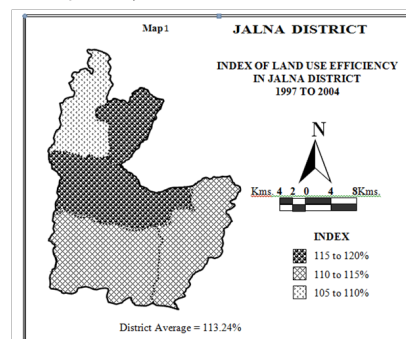
Table No. 3 Landuse Efficiency in Jalna District (Area in Hectares)

| Name of Tahsil | 1983-84 to 1989-90 | | | 1997-98 to 2003-04 | | | Change in Land Use Efficiency |
|----------------|--------------------|---------------|-----------------------------|--------------------|---------------|-----------------------------|-------------------------------|
| | Gross cropped Area | Net Sown Area | Index of landuse efficiency | Gross cropped Area | Net Sown Area | Index of landuse efficiency | |
| Jalna | 176000 | 142600 | 123.42 | 155400 | 133300 | 116.58 | -6.84 |
| Bhokardan | 119600 | 105000 | 113.90 | 118500 | 103100 | 114.94 | 1.03 |
| Jafrabad | 69200 | 54700 | 126.51 | 71100 | 56800 | 125.18 | -1.33 |
| Ambad | 208200 | 183300 | 113.58 | 214300 | 190700 | 112.38 | -1.21 |
| Partur | 145200 | 127000 | 114.33 | 158400 | 131000 | 120.92 | 6.59 |
| Jalna District | 718300 | 612600 | 117.25 | 717800 | 615000 | 116.72 | -0.54 |

Source : 1) Socio-Economic Reviews & District Statistical Abstracts,

1983-84 to 2004-05

2) Computed by the Author.



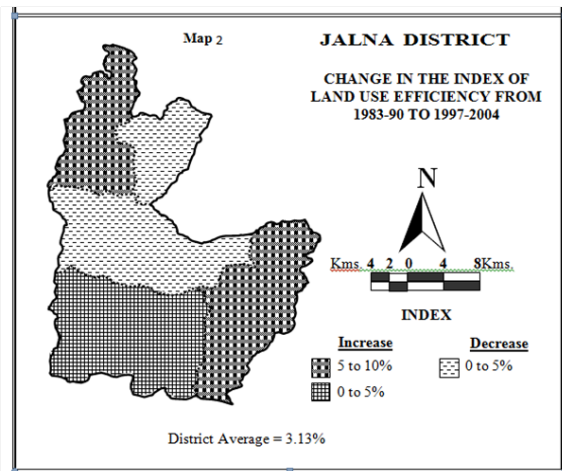


Table 3 indicates that the gross cropped area, net sown area and index of land use efficiency for 1983-84 to 1985-86 & 2001-02 to 2003-04. the gross cropped was 716600 hectares and net sown area was 632800 hectares in 1983-86 (three years average) in the study area, during the period 2001-04 the gross cropped area was 727900 hectares and net sown area was 625500 hectares in Jalna district. The land use efficiency index has increased by 3.13 percent during the period of twenty one years. The highest land use efficiency index was observed in Jafrabad (118.32) tahsil during and the lowest land use efficiency index was recorded in Bhokardan (107.48) tahsil during the period 1983-86. The Jalna districts land use efficiency index was 113.24.

In 2001-04 (three years average) the index of land use efficiency of Jalna district was 116.37 and it has increased by 3.13 percent during the period 1983-86 to 2001-04. The highest land use efficiency was recorded for Partur (119.63) tahsil and the lowest index of agricultural efficiency was found for Jalna (113.35) tahsil during the period 2001-2004.

Both negative and positive changes have been observed in Index of land use efficiency during the period 1983-86 to 2001-04. The highest negative change land use efficiency was recorded in Jalna (4.80%) tahsil and the lowest negative land use efficiency was observed in Jafrabad (4.04%) tahsil during the period under study.

The highest positive change in land use efficiency has been noticed in Bhokardan (9.63%) tahsil while the lowest positive change has been recorded in Ambad (3.66%) tahsil during the period under study.

The Map No. 1 and 2 indicates the taluka wise distribution of land use efficiency. There is lot of variation in land use efficiency and it is due to tahsil wise variation in irrigation. Definitely the relief, soil types, rainfall, different agricultural pattern affects on area sown than once means it

is indirectly affects on land use efficiency. Jalna district is divided in to three regions viz. high intensity, medium intensity and low intensity.

1) High Intensity (Above 115%) :

There are two tahsils in high intensity range i.e. Jalna and Jafrabad tahsils in 1983-86. During the period 2001-04 there are two tahsils in this category i.e. Bhokardan and Partur. No doubt the more irrigational facilities have increased in Bhokardan and Partur tahsil during the period under study.

2) Medium Intensity (110 to 115%) :

During the base years (1983-86) Ambad & Partur tahsils are in this category. After twenty one years means in 2001-04 the medium intensity tahsils were Jalna, Jafrabad and Ambad.

3) Low Intensity (105 to 110%) :

In 1983-86 only one tahsil of Jalna district i.e. Bhokardan tahsil come in this category and in last years i.e. 2001-04 there is no such category tahsil in Jalna district.

Changes have taken place high intensity of cropping as per time. In base year Jalna & Jafrabad tahsil were in this category but after twenty one years Bhokardan & Partur tahsil were in high intensity category. The medium intensity tahsils at base year Ambad and Partur were in this category but in last years Jalna and Jafrabad tahsils were in this category. In low intensity group there was only one tahsil that is Bhokardan. In 2001-04 there was no tahsil in this category.

Conclusions

- 1) The highest index of overall volume of change has been recorded for Jalna (8.77%) tahsil so very dynamic conditions exist there. In Bhokardan tahsil very static conditions have been observed in the change of general land use during the period under study.
- 2) Table No. 1 and 2 indicates the matrix of co-efficient of co-relation in different categories of general land use in Jalna district and different tahsils of Jalna district from 1983 to 2004. Area under forest & other uncultivated land, Area not available for cultivation and other uncultivated land negative correlated. There is also correlation between fallow land and net sown area.
- 3) Table No. 3 indicates that land use efficiency in Jalna district during the 1983-86 and 2001-04. The highest index of land use efficiency was noticed for Jalna tahsil (118.14%) while the lowest land use efficiency was recorded for Bhokardan (107.48%) tahsil during the period 1983-86. The highest index of land use efficiency was recorded for Partur (119.63%) tahsil and the lowest index of land use efficiency has been observed for Jalna tahsil (113.35%) during the period 2001-04.

REFERENCES

- Antelman K. (2004). Do open access articles have greater research impact? College and Research Libraries, 372-382. | Bosc, H. and Harnod S. (2005). In paperless world a new role for academic libraries: | providing open access. Learned Publishing, 18, 95-99. | Emcee, C. G. (2011). Open access initiative and developing world. Available at: | <http://www.ssrn.com/abstract=1304665>. | Galina I and Gimenez J. (2008). An overview of the development of open access journals | and repository in Mexico. Proceeding ELPUB 2008 conference on Electronic | Publishing, Tronto, Canada June 2008. | Harnad, S. and Brody, T. (2004). Comparing the impact of open access (OA) vs non-OA | articles in the same journals. D-Lib Magazine. Available at: | <http://www.dlib.org/dlib/june04/barnad/06harnad.html>. | Leslie, C., Barbara K. and Subbiah A. (2005). Science and Development Network. | <http://www.scidev.net/ms/openaccess>. | Ochalla, D. N. (2011). An overview of issues, challenges and opportunities of scholarly | publishing in information studies in Africa. African Journal of Library, Archives and | Information Science, 21(1), 1-16. | Okafor, V. N. and Dike, V. W. (2010). Exploring barriers in research productivity of | academics in science and engineering faculties in Nigerian universities. An | International journal of Information and Knowledge Management, 1(1), 72-80. | Peterson E. (2006). Librarians publishing preference and open access. Electronic Journals | of Academic and Special Librarianship, 7(2). | Singh, D. (2006). Publication bias a reason for decreased research output in developing | countries. South Africa Psychiatry Review, 9, 153-155. | Smith, J. W. T. (2011). The importance of access to academic publications for the | developing world and the implications of the latest development in academic | publishing. Available at: | <http://www.library.kent.ac.uk/library/papers/jwts/develop.htm>. | Steve, L. (2001). Free online availability substantially increases a paper's impact. Nature | 411-521. | Vose, P. B. and Cervellini, A. (2012). Technical cooperation: problems of scientific | research in developing countries. IAEA Bulletin, 25(2), 37-40. |