

## “A GEOGRAPHICAL ANALYSIS OF TRANSFORMATION OF GENERAL LAND USE IN MARATHWADA REGION”

Dr. Arjun H. Nanaware

Shri Musande M. T.

### **Abstract:**

*Land use involves the management and modification of natural environment or wilderness into built environment such as field, pastures and settlements. Land use is a function of four variables – land, water, air and man. More recent significant effects of land use include urban sprawl, soil erosion, salinity and desertification. Due to influence of dynamic socio economic factors, the land use pattern also goes on getting modified, so much so, that, some time it is wholly replaced after a sufficiently long span of time. Land use study has key role in scientific study. The study of the land use not only provides base for understanding the complex structure of landscape of the region, but also helps for better planning therefore effort is made to study the transformation of land use. The present paper is based on secondary sources. To determine transformation of land use, the Karl Pearson's coefficient of correlation is used. On the basis of value of negative correlation the transformation of land use is determined and conclusions are drawn. The study reveals that the net sown area is converted into fallow land due to inadequate insufficient and unpredictable rainfall and lack of perennial irrigation facilities.*

**Key words:** Transformation, land-use, Correlation.

### **Introduction:**

Land is very significant and basic natural resources on which man make his all types of development. Land use involves the management and modification of natural environment or wilderness into built environment such as field, pastures and settlements, it has been defined as “ the arrangement, activities and inputs people undertake in a certain land cover type to produce, change or maintain it” (FAO, 1997, FAO/UNEP, 1999). Land use is a function of four variables – land, water, air and man. Each plays its own role in composing its life history. Land constitute its body, water runs through its veins life blood, air gives it Oxygen and man acts as dynamic actor to reflect its types, pattern and distribution (Singh R.P.,1992). Land

use / land cover pattern of a region is an outcome of natural socioeconomic factors and their utilization by man in time and space. Land use and land management practices have major impact on natural resources including water, soil, nutrients, plants and animals. More recent significant effects of land use include urban sprawl, soil erosion, salinity and desertification. Land use and land cover change has become an important component in current strategies for managing natural resources and monitoring environmental changes (Hangaragi S.S., 2011). Land is becoming a scarce commodity due to immense agricultural and demographic pressure. Hence, information of land use and land cover and possibilities for optimal use is essential for the selection, planning and implementation of land uses schemes to meet the

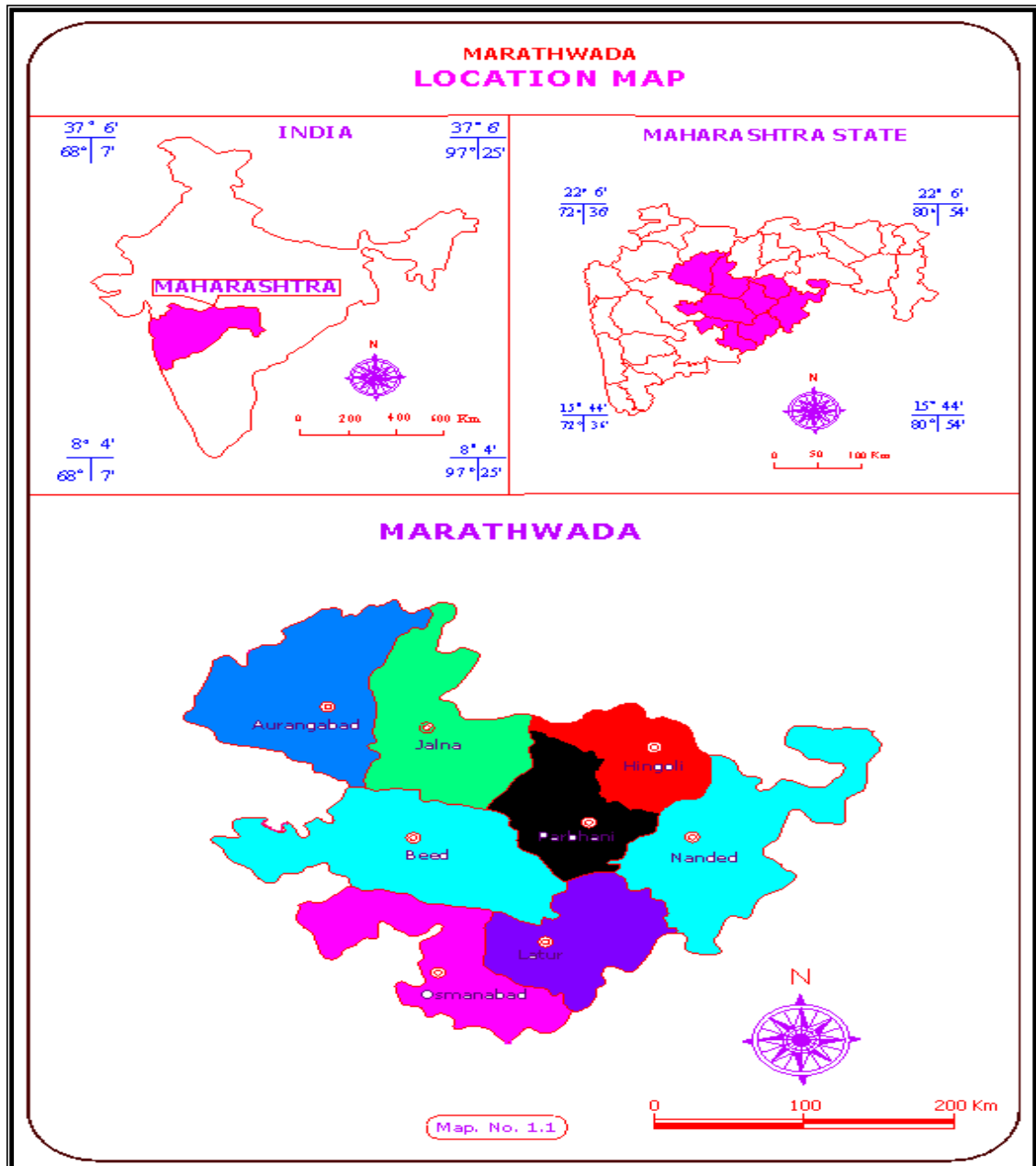
increasing demands for basic human needs and welfare (Mahlingam and Patil S. A., 2011). Land use / land cover study has key role in scientific study. Throughout the world, emphasis has been given on such study due to increasing demand for land as it's limited availability (Vaidya & Nannaware, 2013).

Systematic utilization of land is able to promote economic and cultural development. Without utilization of land, one cannot think of any progress. With a shift towards modernization and globalization, land use land cover has been changing remarkably all over world (Rath P. K. etc., 2009). Due to the growth of population, many changes in land-use have taken place. Forest and grassland are converted into agricultural, industrial, settlement, and transportation and mining land. Because of ever increasing population pressure on land, the land resources are depleting rapidly. The study of transformation of land utilization is of immense value in tracing out the use of land in the past and its future trends. Through the study of transformation of land utilization, one can predict its future use and evolve land-use planning of a particular region.

Therefore attempt is made here to study the transformation of land use in Marathwada region.

### **The Study Region:**

The Maharashtra state is administratively divided into six divisions, viz. Konkan, Nasik, Pune, Amravati, Nagpur and Aurangabad. The Aurangabad division is also known as Marathwada region, which was formerly a part of Hyderabad state. Marathwada forms the central portion of Maharashtra with Aurangabad city being located almost in the centre of the state (Fig. -1). Marathwada is one of the most backward regions of Maharashtra state. The Marathwada region lies in the upper Godavari basin. The absolute location of Marathwada region is  $17^{\circ} 35'$  to  $20^{\circ} 40'$  North latitude and  $74^{\circ} 40'$  to  $78^{\circ} 19'$  East longitude. The study region is bounded on the North by Jalgaon, Buldhana, and Akola districts, to the North-east by Yavatmal district, to the East by Kamareddi, Nizamabad and Adilabad districts of Andhra Pradesh, to the South and South-east by Bidar and Gulbarga districts of Karnataka state, to the West by Ahmednagar to the Southwest by Solapur and to the North-west



**Figure -1**

by Nasik district. Its shape is roughly triangular. East-West maximum extent is 394 Kilometers and North-south extent is 330 Kilometers. The total geographical area of district is 64434

Sq. Km. which constitutes 20.95 per cent of the state and its population is 1.87 cores which is 16.66 per cent of the state (2011). Administratively area is divided into eight districts and 76 tehsils.

**Objectives:**

The Main objective of the present paper is to determine and analyze the transformation in general land use in Marathwada region.

**Data collection and methodology:**

The present paper is based on secondary sources. The data regarding general land use are collected from Socio Economic Review and Districts Statistical Abstract of districts of Marathwada region for the period of 1981-86 to 2005-10. The data regarding population and location of study area is collected from District Census Hand book and Gazetteers of districts of Marathwada region.

Collected data are processed. To avoid fluctuation in area under different land use categories and to get reliable result quinquennial average is taken into consideration. Percentage of area under each category to total geographical area is calculated. To determine transformation of agricultural land use, the Karl Pearson’s formula i. e.

$$r = \frac{\Sigma xy}{\sqrt{\Sigma x^2 \Sigma y^2}}$$

is used and the value of coefficient of correlation is calculated. Correlation between different land use categories gives idea about transfer of area between different land use categories. The total geographical area has been divided in to five categories Viz. Area under forest, Area not available for cultivation, Other uncultivable land, Fallow land and Net area sown naturally a change in one followed by a change in another or all the reaming categories. The co-efficient of correlation of each of the category with rest of the categories have been calculated. On the basis of value of negative correlation the transformation of land use is determined and conclusions are drawn.

Correlation between Different Land-Use Categories and Transformation of land use:

**1. Transformation of area under forest into rest of categories:**

I. During the period of investigation, high negative correlation between area under forest and other uncultivable

land is found in Hingoli and Beed districts which is amounted at - 0.84 and - 0.86 respectively. In Hingoli and Beed district the area under

forest is increased which indicates that the other uncultivable land is converted into forest area due to a forestation.

II. High negative correlation between area under forest and fallow land is found in Aurangabad, Jalna and Parbhani districts i.e. above -0.85 coefficient of correlations, and decrease in Area under forest indicates that area under forest is transferred into fallow land due to degradation of forest.

III. The high negative correlation between area under forest and net sown area is found in Latur district i.e. - 0.72 coefficient of correlations and increase in area under forest indicates that some of net sown area is transferred to area under forest through new plantation.

## **2. Transformation of Area not available for cultivation into other Categories:**

Considering the district as a whole, the region as a whole has also high negative correlation between area not available for cultivation and other uncultivable land i. e. – 0.69. However,

district level analysis varies, which is as following.

I During the period of under review, high negative correlation between area not available for cultivation and other uncultivable land is found in Jalna and Osmanabad district i.e. above -0.68., and loss of area not available for cultivation indicates that area not available for cultivation is converted into other uncultivated land i.e. settlements, roads, canals, tanks, with the population growth.

## **3. Transformation of other uncultivable land to other Categories:**

I. The table 1 reveals that other uncultivable land has high negative correlation with fallow land in Parbhani district which is amounted - 0.71 coefficient of correlation, and decrease in fallow land indicates that fallow land is converted into cultivable waste, permanent pasture and groves.

II. The high negative correlation between other uncultivable land and net sown area is recorded only in Hingoli districts, which is amounted at – 0.82 coefficient of correlation.

Table -1 Matrix of Co-efficient of Correlation between different Categories of General Land use.

District/ Region	Category	A	B	C	D	E
<b>Aurangabad</b>	A		-0.44	-0.14	-0.88	0.92
	B			-0.34	-0.19	-0.08
	C				0.42	-0.33
	D					-0.99
	E					
<b>Jalna</b>	A		0.63	-0.41	-0.85	0.82
	B			-0.94	-0.57	0.53
	C				0.53	-0.52
	D					-0.99
	E					
<b>Beed</b>	A		-0.32	-0.86	-0.21	-0.14
	B			0.01	-0.34	0.35
	C				0.32	0.01
	D					-0.89
	E					
<b>Latur</b>	A		0.69	0.93	0.87	-0.72
	B			0.5	0.58	-0.33
	C				0.73	-0.66
	D					-0.92
	E					
<b>Osmanabad</b>	A		0.76	-0.49	0.55	-0.53
	B			-0.68	0.54	-0.53
	C				-0.59	0.59
	D					-0.99
	E					
<b>Nanded</b>	A		-0.19	0.47	0.02	-0.13
	B			-0.47	-0.26	0.58
	C				0.09	-0.16
	D					-0.48
	E					

<b>Parbhani</b>	A		0.5	0.23	-0.94	0.84
	B			0.8	-0.44	0.31
	C				-0.71	0.61
	D					-0.96
	E					
<b>Hingoli</b>	A		0.79	-0.84	-0.89	0.69
	B			-0.65	-0.56	0.35
	C				0.92	-0.82
	D					-0.84
	E					
<b>Marathawada</b>	A		0.12	0.47	-0.54	0.55
	B			-0.69	-0.16	0.09
	C				0.07	-0.03
	D					-0.98
	E					

Source: Compiled by Researcher on the basis of Socio Economic Review and District Statistical Abstract of districts of Marathwada region 1981-82 to 2009-10

Note : Where, **A** = Area under forest, **B** = Area not available for cultivation, **C** = Other uncultivable land, **D** = Fallow land, **E** = Net area sown

#### 4. Transformation of Net area sown into fallow land:

The table 1 indicates that the region as whole has high negative correlation between Net area sown and fallow land during the period of investigation. The spatial analysis also reveals that, high negative correlation between fallow land and Net sown area is found in Latur, Aurangabad, Jalna, Beed, Parbhani, Hingoli and Osmanabad districts i.e. above - 0.84, and considerable decrease in net sown area indicates that much of the net sown area is converted into fallow land

due to inadequate insufficient and unpredictable rainfall and lack of perennial irrigation facilities.

The high negative correlation between area under forest and other uncultivable land in Hingoli and Beed district i.e. above - 0.84 and decrease in other uncultivable land indicates that other uncultivable land is converted in to forest area due to afforestation during the period of investigation.

The high negative correlation in between area under forest and fallow land in Aurangabad, Jalna and

Parbhani districts i.e.  $> - 0.85$  and decrease in forest area indicates area under forest is converted into fallow land.

The high negative correlation between other uncultivable land and fallow land in Parbhani district i.e.  $- 0.71$  and decrease in other uncultivable land reveals that other uncultivable land is transferred under fallow land.

The high negative correlation between fallow land and net sown area in Latur, Aurangabad, Jalana, Beed, Parbhani, Hingoli, Osmanabad districts and decrease in net sown area indicates that net sown area is transferred into fallow land in these all district during the period of investigation.

### **Conclusions:**

The forgoing analysis reveals that during the period of investigation the region as a whole has high negative correlation between fallow land and net sown area i.e.  $-0.98$  and decrease in net sown area indicates that the net sown area has been converted into fallow land. The high negative correlation between area not available for cultivation and other uncultivated land i.e.  $-0.69$  and increase in area not available for cultivation indicate that other uncultivable land is converted into area not available for cultivation during the period of investigation.

The high negative correlation in between fallow land and net sown area in Latur, Aurangabad, Jalana, Beed, Parbhani, Hingoli, Osmanabad districts of study region, which indicates that much of the net sown

area is converted into fallow land due to inadequate insufficient and unpredictable rainfall and lack of perennial irrigation facilities. The conversion of other uncultivable land into area under forest and in Hingoli and Beed district is a result of afforestation during the period of investigation.

The high negative correlation between area under forest and fallow land in Aurangabad, Jalna and Parbhani districts and decrease in forest area indicates area under forest is brought under cultivation but later on it is converted into fallow land mainly due to frequency of drought scarcity of rainfall and insufficient surface irrigation facilities

The high negative correlation between other uncultivable land and fallow land in Parbhani district and decrease in other uncultivable land reveals that other uncultivable land is transferred under fallow land, which is mainly due to unpredictable and uncertain rainfall.

The high negative correlation between area not available for cultivation is converted into other uncultivable land in Jalna and Osmanabad district i.e. settlements, roads, canals, tanks, with the population growth.



## References:

1. Hangaragi S. S.(2011):  
Assessment of Land Use / Land  
Cover Change In Bagalkot  
District of Karnataka, The Goa  
Geographer, Vol. VIII, No. 1  
Pp.20.
2. Mahlingam and Patil S. A.,  
(2011): Land Use and Land  
Cover Change Due to  
Anthropogenic Activity Along  
Coastal Stretch of :anchipuram  
District of Tamilnadu,  
Proceeding of the three day  
national Seminar on  
Population, Environment and  
Tourism, Athalye Arts, Sapre  
Commerce, and Pitre Science  
College, Devrukh, Pp.43
3. Rath P. K. etc., (2009): Land  
Use – Land Cover Changes in  
Shiroda Village of Goa, The  
Goa Geographer, Vol. VI, No.  
1 Pp.19.
4. Singh, R.P. (1992): Concept of  
Landuse, New Diamensions in  
Agricultural Geography,  
Volume 4, Concept Publishing  
Company, New Delhi, Pp.73
5. Vaidya B. C. and Nannaware  
(2013): “Assessment of Land  
Use / Land cover Dynamics in  
Parner Tehshil by using  
Remote sensing Technique”,  
International Geographical  
Journal, The Deccan  
Geographer, Volume 51,  
Number 1&2, Pp 109.