

SPATIO-TEMPORAL CHANGE IN AGRICULTURAL LAND USE PATTERN IN PUNE DISTRICT MAHARASHTRA

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Abstract

Abstract: Land use land cover change is a dynamic process. As population pressure is increasing, the land use land cover pattern is also changing. Humans have negatively affected land use and land cover pattern over the world. Land use is the application of human controls in a systematic manner, indicating an intimate relationship between prevailing ecological conditions and man (More, patil, 1995). In the present paper, an attempt has been made to find out changing land use pattern within a very short span of time i.e. 3 years (1981 to 2011) of Pune district in Maharashtra. The study and the assessment of land use change are of vital importance for future land use planning and development of the area. Therefore the study of land use and its change has been carried out by many researchers and geographers at national and international level. The Present work is related on the assessment of the relationship between population growth and land use change, urbanization growth and general land use change.



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Introduction:

Land use and land cover change is for the human modification of earth's terrestrial surface. The human being has been modifying land to obtain food and other essentials from thousands of years. Land use is the surface utilization of all developed and vacant land on a specific point at given time and space (Mandal, 1982). Physical as well as non-physical factors determine the land use of any area. Population growth and urbanization growth are the non-physical determinants of the land use. In India 63 percent population lives in rural area and it contributes nearly 17.20 percent of gross domestic product. Over 63 percent population depends on agriculture for their livelihood (Datta and Sundharam, 2006). Distribution of agriculture depends upon large number of geo-hydrological, environmental, biological and socio-economic variables. In India 60 percent area is rainfed. Agricultural landscape has drastically changed in the last two decades. Better agriculture techniques have successfully applied in order to achieve self sufficiency in

agriculture production. Hence for the present study it has been attempted to study the land use and changes in it at district level for the period of 1981 to 2011 by taking into account the population and urbanization growth.

Study area: Pune district is extended from 17° 54' and 10° 24' north latitudes and 73° 19' and 75° 10' east longitudes covering 15,642 square kilometers area and population of 94,26,959 in 2011 censuses. This region is bounded by Ahmednagar district on northeast, Solapur district on southeast, Satara district on south, Raigad district on west and Thane district on northwest. It is the second largest district in Maharashtra state accounting 5.10 percent area. The slope is towards southeast. In west, there is Sahyadri basaltic mountain running north to south. Average rainfall is 600 mm during July to October. The summer begins from early March to June experiencing dry and hot climate. The temperature ranges from 20° to 38°C. From November to January temperature lower from 9°C to 14°C. January to March appears moderate temperature. The study region has 60 percent net sown area. Total irrigation in study area is 27 percent. There are 26.9 percent cultivators and 12.7 percent agricultural labourers in study region. The main crops in study region are jowar, rice, bajara, wheat, sugarcane, groundnut, gram, safflower, crops and many vegetables crops fields. The per capital land holding of farmers is 1.54 hectares. Kharif, rabi and summer seasons are observed in study region.

Objectives:

- 1) To study physiographic relation to agriculture in the study region.
- 2) Identifying cropping pattern and socio economic relation in study region.
- 3) To suggest remedial measures for better agriculture land use in study region

Methodology:

The present study was based on primary and secondary sources for the present study data of six major categories of land use have been analyzed. The main body of the data used in this study is obtained from secondary source that is socio-economic abstract of the Pune district. The data about population and urbanization is obtained from District Census Handbooks, Pune. Statistical tools like percentage, average etc. have been used in the study. The data of population, urbanization and land use pattern is represented by using simple line graph and multiple bar graphs. The published sources, namely, Taluka Revenue Record, Socio-economic Abstract of Pune District., District Census Handbook, Taluka Land Record Office have used in present

study. The data for general landuse and agricultural landuse have been taken for the years 1981 to 2011. An attempt is made to examine the changes that have occurred in land use during the last 30 years (1981- to 2011).

Table No. 1
Landuse pattern of Pune district Maharashtra

Sr. No	Name	Percentage of cultivable area to total area	Percentage of irrigated area to total cultivable area
1	Junnar	63.45	40.70
2	Ambegaon	64.66	24.75
3	Shirur	77.20	34.64
4	Khed	60.42	21.87
5	Maval	47.45	7.06
6	Mulshi	52.99	3.86
7	Haveli	60.37	36.39
8	Daund	68.11	58.32
9	Purandar	67.40	29.35
10	Velhe	54.26	2.16
11	Bhor	50.47	12.50
12	Baramati	76.25	57.19
13	Indapur	77.98	50.34
14	Pune city	0	0

(Source: Socio Economic Survey Pune District 1981-2011)

Agriculture: Most of the people of this District are engaged in agricultural activities. As per 2011 Census, 21.90 percent of the total workers are engaged as cultivators and 10.24 percent of the total workers are engaged as agricultural labourers in the District. Together constitute 32.14 percent of the total workers of the District.

Land use Pattern Land use is a primary indicator of the extent and degree to which man has modified the land resources. It is the application of human controls in a systematic manner, indicating an intimate relationship between prevailing ecological conditions and man (Vink, 1975). The land of the study area is grouped into six major categories viz.1. Net sown area 2. Barren land 3. Cultivable waste 4. Fallow land 5. Forest 6. Land put to non agricultural uses.

Forest: At least 33% forest is necessary for keeping the environmental balance. In the pune district in 2011 forest is 1950.50 sq kilometer. It indicates that there is slight and continuous increase during these four decades. The area under forest decreased due to the urbanization, road and infrastructure facilities for the human being and industrial development. In pune district hill station towns have been prepared or second home concept is increasing so the forest is cut or hilly area of the district where forest is present is cut.

Net sown area: Net sown area refers to that part of the cultivated land on which sowing is actually done at least once during a year (Dhian, 1991). The net sown area in the district is increased in some of the tahsil of pune district like shirur, Ambegaon due o the cannal irrigation from he upper bhima basin.

Cultivable Waste Land: Cultivable waste land refers to the potential land over which cultivation can be extended with some effort. Due to these negative factors, this category of land has become un-economic and un-productive (Dhian Kaur, 1991). These lands can be brought under cultivation if they are provided with cultivable facilitates (Rayamane, 2001).

Land put to non-agricultural uses: This category includes the land occupied by the buildings, roads, railways, factories, villages, towns, water bodies, playground etc. After the independence the population is continuously increasing and the need of infrastructure facilities are increasing. In pune district mainly known as the oxford of the east various educational institutes and MIDC for the various industries has been prepared by the government of Maharashtra. So the big change is recorded in this category. This change is due to rising population, development of road network and increase in built up area. The land under non agricultural uses is 114.0 sq km.

Barran and non-cultivable land: Barren and non-cultivable land includes outcrops of hills and mountains. This land is associated with poor soils, heavy rainfall and instance erosion (Vaidhya, 1997). In pune district the foothills of Sahyadri ranges Maval, Mulshi, Junnar and Bhore tahsil have the barran land and non-cultivable land. The barren land is 147.7 sq km in the pune district.

Fallow Land: The term fallow is applied to the lands not under cultivation at the time of reporting but has been sown in the past (More patil). Current fallow land is 34.5 sq km and other fallow land is 39.8 sq km in the pune district. Fallow land percentage is increasing in recent years due the agricultural practices in the district.

Permanent pasture: This pasture land is used for the grazing of animals in the district around 74.6 sq km area is under this category.

Table No. 2
Agricultural Land use pattern Pune district

Sr. No.	Cultivable area	Forest area	Land under nonagricultural uses	Permanent pasture	Cultivable waste land	Land under Misc, tree crops and groves	Barran land and uncultivable land	Current fallow	Other fallow
1	945.4	165.1	114.0	74.6	38.1	13.1	147.4	34.5	39.8

(Source: Pune District census Handbook 1981 - 2011)

Population rural and urban ratio:

According to the 2011 census, 60.99 percent lives in urban regions of district. In total 5,751,182 people lives in urban areas of which males are 3,020,665 and females are 2,730,517. Sex Ratio in urban region of Pune district is 904 as per 2011 census data. Similarly child sex ratio in Pune district was 892 in 2011 census. Child population (0-6) in urban region was 664,857 of which males and females were 351,417 and 313,440. This child population figure of Pune district is 11.63 % of total urban population.

Conclusion: It is concluded that the growth of population and urbanization is continuously and steadily increasing in the study area. The main reason behind of that the infrastructural, education facilities, social security and the attraction of the urban areas so the population of the city is increasing and the urban fringe area of the city is crowded and pressure on the land use. The forest is cut across the foothills of the district, the forest area is decreasing. The net sown area in some of the tahsil has been increased but in some of the tahsil near by the city its decreasing. Overall the land use pattern in the district is changed and in the recent years the net sown area will be decreased due to the need of houses and for the rail, road infrastructural facilities.

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