Growth Action of Land Utilization Pattern in Parbhani District of Maharashtra, India

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A B S T R A C T

The present study examines the growth action of land utilization pattern of Parbhani district in Maharashtra State. Using data from 2002-03 to 2016-17, linear and compound growth rate of land utilization pattern in Maharashtra state was estimated for each period to study the growth performance. In the District-, gross cropped area occupies major portion in total geographical area of the state followed by net sown area and forest area. Despite of this, area under current fallow, other fallow occupies prominent portion in total area. Area under the fallow is increasing. Hence importance is given to prevent converting cropped area to waste land. The study suggests farmers to make use of available resource efficiently to convert cultivable waste land and fallow land into farm land.

Introduction

Land is an important resource because it covers about 30% of the total area of the earth's surface and not all parts of this small percentage are habitable or productive. The pattern of land use of country at any particular time is determined by the physical, economic and institutional framework taken together. Though technological progress in agriculture and agricultural intensification have mitigated the demand for land for non-agricultural purposes are posing a serious challenge to both researchers and policy makers. Intensive agriculture coupled with large-scale irrigation projects without utilized or unutilized. For sustainable utilization of the land ecosystems, it is essential to know the natural characteristics, extent and location, its quality, productivity, suitability and limitations of various land uses. The growth of population is greater than the rate of growth of food production. It is usually achieved through proper use of land resources with the application of bio-fertilizers, double cropping, modern methods of irrigation and manpower.

In developing countries, the agriculture is the backbone of the economy. In India, agriculture contributes 17-18 per cent to the

Gross Domestic Product (GDP) during the year 2017-18. Agriculture sector provides employment to more than 50 per cent of country's workforce and is the single largest private sector occupation. The government has already taken steps to address two major factors (soil and water) critical to improve agriculture production. Steps have been taken to improve soil fertility on a sustainable basis through the soil health card scheme and to support the organic farming scheme 'Paramparagat Krishi Vikas Yojana'. Other steps include improved access to irrigation through 'Pradhanmantri Krishi Sinchai Yojana'; enhanced water efficiency through 'Per Drop More Crop'; continued support to Pradhan Mantari Fasal Bima Yojana and the creation of a unified national agriculture market to boost the incomes of farmers.

In Parbhani, Net sown area, gross cropped area, land under non-agriculture use shows increase in percentage change with positive sign. Area under forest, permanent pastures, area sown more than once gross cropped, cultivable waste land, fallow land shows decrease in percentage change. It clearly shows that fallow land, land under non-agricultural use should be used properly to improve land utilization pattern of the state. In present study a comparison is done to analyze percentage change in area under Land utilization pattern for two different periods and growth rates were identified for the same period.

To study changes in land utilization pattern in Parbhani district.

Materials and Methods

In the present study, Linear Growth Rate (LGR) and Compound Growth Rate (CGR) were estimated for each period to study the growth LUP. For studying the growth rate in land utilization pattern, linear growth rate was estimated by using following linear functions.

$$Y = a + bx + e$$

Where

Y = Dependent variable for which growth rate is estimated
a= Intercept/Constant
b= Regression/trend coefficient
x= Period in years
e= Error term with zero mean and constant variance.

Compound Growth Rate was then estimated by using the following equation:

$$Y = a \cdot b^x$$

Y= Dependent variable for which growth rate is estimated
a= Intercept or constant
b= Trend / Regression coefficient
x= Period in years

$$b = (1+r)$$

where, r = is compound growth rate

$$C.G.R. = (\text{antilog of } b-1) \times 100$$

The necessary data for the selected cereals crops was purely based on secondary sources and it was collected from various issues of Statistical Hand Book of Maharashtra, Season and Crop report of Maharashtra. To work out triennium averages for base period i.e., 2002-03, period considered were 2000-01, 2001-2002, 2002-03 and for end period i.e., 2016-17, period for triennium considered were 2014-15, 2015-16, 2016-17 simple arithmetic averages, percentages of selected parameters of development were used for the comparison of situation in Parbhani over three period of time. Time period I, II and III represents time series data for 2002-03 to 2008-09, 2010-11 to

2016-17 and 2002-03 to 2016-17 respectively. The present study examines the growth performance of Land Utilization Pattern in Maharashtra State.

Table 1 reports the Land utilization pattern for the period of 2002-03 to 2016-17. It reveals that area under current fallow is constantly decreasing throughout the period and area sown more than once is decreasing. Gross cropped area of the state is also increasing. Area under forest is decreasing but change is minute when compared to other particulars.

Results and Discussion

Land utilization pattern in Parbhani district of Maharashtra (2002-03 to 2016-17)

Land under non-agricultural use is increasing eminently for the entire study period. There is prominent decrease in area sown more than once. Area under permanent pasture is decreasing, but in meager level for every year, when compared to other changes. Forest area of the district also started to diminish.

Due to change in climate, unavailability of water, labour and resources area under agriculture is decreased. Gross cropped area of the district is increased from 81.71 per cent to 88.13 per cent of the total geographical area. Likewise net sown area also increases from 54.77 per cent to 72.58 per cent of total geographical area. Land utilization pattern of the district for the study period is given in Table 1.

Percentage change of land utilization pattern for the period 2002-03 to 2016-17

Due to availability of resources at needed time net sown area of the district has increase and its percentage change is increase with positive growth. Similarly area under permanent pastures, area sown more than once and cultivable waste shown change in percentage with negative growth. This leads to positive change in land under non-agricultural use, gross cropped area. Land under misc trees, grooves not included in area sown, fallow land shown change in percentage of negative growth of the district is given in table 2.

Growth rates

The linear and compound growth rate of the parameters were worked out and presented in Table 3. The average area under forest and barren, uncultivable land were non-significant for entire working period. Area under land under non-agricultural use was significant at 5 % for period I and II. The average area under current fallow had been significant at 1 % for overall period.

The gross cropped area for period II was significant at 5%. The average area under cultivable waste land, permanent pastures, land under misc trees, grooves not included in area sown, area sown more than once were non-significant for overall period.

Gross cropped area for state has been increased significantly in both linear and compound growth rate. It had been decreased from 0.04 to 0.61 per cent in linear growth and 0.083 to 0.52 per cent in compound growth rate.

In conclusion, the dynamics of land use pattern in the district over the last fifteen years reveals that there was a significant decline in the area under cultivable wastes and barren land, net sown area, area sown more than once, permanent pastures while there was a sharp increase in land under non-agricultural use, gross cropped area,

Table.1 Land utilization pattern in Parbhani district of Maharashtra (2002-03 to 2016-17) (Area in ha)

Year	Forest	Barren and uncultivable land	Land under non-agricultural use	Cultivable waste land	Permanent pastures	Land under misc trees, grooves not included in net area sown	Current fallow	Other fallow	Net sown area	Area sown more than once	Gross cropped area
2002	18000	11000	27800	30000	35000	12300	9700	45000	345600	170000	515600
2003	18000	9500	29100	32500	28000	12500	11000	44000	345200	190000	535200
2004	17700	8500	29100	20000	25000	17800	10100	39800	337100	465000	802100
2005	17700	18000	30200	37000	23000	16200	10000	38600	296300	398200	694500
2006	16000	12000	31100	25000	19000	14200	13000	37700	286300	365200	651500
2007	15600	10000	32000	32000	17500	11800	15000	36900	275600	356400	632000
2008	14000	10000	36000	21000	30000	11700	9700	34300	540600	451000	991600
2009	14000	19000	42000	36000	21000	5000	9300	24000	889000	290000	1179000
2010	13500	10000	32000	36000	21000	5000	8000	30000	486000	260000	746000
2011	12700	9000	30000	36000	21000	5000	7000	29000	460000	250000	710000
2012	12500	10000	32000	36000	21000	2000	8000	30000	815000	546000	1361000
2013	11000	9000	32000	4000	18000	4000	8000	30000	483000	861000	1347000
2014	10000	10000	32000	8000	18000	10000	8000	30000	517000	371000	881000
2015	10000	10000	32000	24000	30000	10000	8000	30000	517000	167000	684000
2016	10800	10000	32000	24000	30000	10000	6000	30000	410000	155000	565000

Source: Department of Statistics, Parbhani (2016)

Table.2 Percentage change in land utilization pattern of the district

Sr. No	Category of Land	Triennium ending average 2002-03	Percentage to total area	Triennium ending average 2009-10	Percentage to total area	Percentage change
1	Forest	18000.00	2.85	10800.00	1.71	-40
2	Barren and uncultivable land	11000.00	1.74	10000.00	1.58	-9.09
3	Land under non-agricultural use	35000.00	5.54	32000.00	5.07	15.10
4	Cultivable waste land	30000.00	4.75	24000.00	3.80	-20.00
5	Permanent pastures	35000.00	4.59	30000.00	4.75	-14.28
6	Land under misc trees, grooves not included in area sown	12300.00	0.95	10000.00	1.58	-19.16
7	Current fallow	9700.00	0.79	6000	0.95	-38.00
8	Other fallow	45000.00	2.06	30000	4.75	-33.11
9	Net sown area	345600.00	54.77	410000.00	72.58	18.63
10	Area sown more than once	170000.00	26.78	155000	24.18	-8.82
11	Gross cropped area	515600	81.71	565000.00	88.13	9.58
12	Total area	631000.00	100	631000.00	100	0.00

Table.3 Growth rate of land utilization pattern

Sr. No.	Particulars	LGR			CGR		
		I	II	III	I	II	III
1	Forest	-0.12**	-16.94**	-6.45*	-0.12*	-18.04**	-8.24**
2	Barren and uncultivable land	1.44*	-6.67*	-1.08**	1.61*	-4.97*	-0.85*
3	Land under non-agricultural use	0.00*	-2.30*	-0.62*	-0.27*	-2.01*	-0.56*
4	Cultivable waste land	-2.91*	-12.13*	-3.05*	-3.08*	-12.87*	-5.21*
5	Permanent pastures	3.49*	5.07*	-0.48*	-3.89*	4.45*	-0.59*
6	Land under misc trees, grooves not included in area sown	-2.74*	11.18*	2.46*	-2.60**	8.34*	0.85*
7	Current fallow	26.58*	-19.12*	-1.28**	31.94**	-13.48*	-2.20*
8	Other fallow	12.50*	1.83*	5.27**	13.43**	2.00*	6.13**
9	Net sown area	2.01*	-6.83*	-1.91*	1.46**	-5.79*	-2.10*
10	Area sown more than once	7.77*	-1.72*	0.77*	9.55*	-4.37*	-0.55*
11	Gross cropped area	4.01*	-3.83*	-1.48*	4.10**	-3.75*	-1.79*

*Significant at 5 per cent, **Significant at 1 per cent

The land under misc trees, grooves not included in net area sown. The study reveals that there has been a significant reduction in the area under common lands mainly because of the diversion of these lands for nonagricultural purposes. Stabilization of irrigated acreage is perhaps a more important step than the expansion of irrigation so as to better utilize land resources. The analysis of factors affecting the extent of fallow lands at the farm level using cross-section data reveals that increase in farm size, non-agricultural income and labor shortage have strong positive impact on the extent of fallow lands, while the credit availability and irrigation facilities are found to reduce the extent of fallow lands at the farm level. Another important measure is the institutional reform to ensure the prevention or regulation of converting fertile agricultural lands for non-agricultural purposes is another important mechanism to stabilize the net sown area. Conversion for non-agricultural purposes appears to be the most important threat to the common property land resources such as cultivable wastelands, land under miscellaneous tree crops and groves and grazing lands.

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