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"AN ECONOMIC ANALYSIS OF LAND USE DYNAMICS IN GUJARAT"

ABSTRACT

Key words: land use dynamics, temporal changes, impact on cropping intensity, ecological sector, inter-sectoral land use shift

Land is the crucial natural resource for development activity of any state or nation. It is required for both agriculture and non-agricultural purposes, including establishment of housing, industries, roads, parks, railway lines as well as other mercantile activities. Generally, it is considered that development activities require more land and there is a general fear that it might encroach upon agricultural land, particularly the fertile land in the rural areas. An analysis of structural changes in the land use pattern over a period of time provides scope for planned and judicious management of land. In this connection, the present study on ‘An Economic Analysis of Land Use Dynamics in Gujarat’ was undertaken.

The study was undertaken using secondary sources and the necessary districtwise and state level time series data on area under land use categories were compiled from various issues of Statistical Abstract of Gujarat State and other publications of Government. The entire period of 1970-71 to 2014-15 was decomposed into three periods, viz; Pre-liberalization, Post-liberalization and Overall Period. A temporal change in land use pattern was estimated with the percentage change, compound growth rates and instability. Markov chain analysis was employed to examine the nature and extent of land use shift between major land use categories. Multiple regression analysis was used to identify the important factors responsible for the changes in land use dynamics. To identify the impact of land use shift on cropping intensity, multiple regression of double log form was used. Annual rate of changes were estimated to study the intra and inter sectoral land use shift.

The temporal changes in land use dynamics of Gujarat state revealed that, land put to non-agricultural use, net area sown and area under forest showed an increase while, fallow other than current fallow, cultivable waste, current fallow, barren & unculturable land and permanent pastures & other grazing lands registered a decline during Period-II (1991-92 to 2014-15). Gujarat state has recorded 4.66 per cent of increase in the net area sown however; it was only 0.28 per cent at national level during the study period.

Apart from percentage change, growth rate analysis revealed that during Period-II, permanent pastures and other grazing land, land put to non-agricultural use and net area sown in Gujarat state as a whole significantly increased by 0.02, 0.21 and 0.43 per cent per annum, respectively. But cultivable waste, barren and uncultivatable land, forest, fallow other than current fallow and current fallow declined by 0.05, 0.12, 0.14, 3.07 and 4.27
per cent per annum, respectively. The growth rates and instability for fallow land categories were found to be higher. As compared to Period-I, the majority of the districts showed declining growth rates of barren and uncultivable land in Period-II which is the desirable situation. During Period-I as well as Period-II, more than half of the districts of Gujarat registered a significant decline in area under permanent pastures and grazing lands which is an alarming situation from ecological point of view and survival of the livestock in the state. During all the three study periods, area sown more than once, net irrigated area and gross irrigated area significantly increased in Gujarat state.

Markov chain analysis envisaged that, the net area sown was highly stable among all the land use categories with the retention of 84.30 per cent of its previous years’ share while land not available for cultivation retained 74.30 per cent of its previous years’ share in Gujarat. During all the three periods, net area sown was a major gainer among the different land use categories with the gain of 53.00, 20.90 and 19.20 per cent from fallow land, land not available for cultivation and forest, respectively.

The results of multiple regression analysis revealed that the population has showed negative influence on the area under forest in Gujarat during the period 1970-71 to 2014-15. As far as the barren and uncultivable land is considered, it was negatively influenced by the number of factories in the state. The irrigated area showed positive influence on the net area sown in Gujarat with the significant regression coefficient of 0.788.

Cropping intensity was influenced positively by changes in the area put to non-agricultural uses. Except in some cases, it has been observed that almost in all the regions, districts and at the state level, changes in land use categories did not reflect considerable impact on cropping intensity in Gujarat. Further, net irrigated area influenced the cropping intensity significantly than any other variables at the state level. The regression coefficient of net irrigated area (0.150) signified that the increase in land under irrigation increased the cropping intensity.

Ecological implications of land use dynamics in Gujarat revealed that area shift under desirable ecology compared to undesirable ecology has not been favourable in Period-II, where land-use shift has been occurring from the desirable ecology towards agricultural and non-agricultural sectors. Disaggregated inter-sectoral land use shift in Gujarat implies that the area shift under desirable ecology compared to undesirable ecology has not been found favourable across different districts. The shift of area from desirable to undesirable ecological sector may have long term negative environmental implications. Integration of agricultural and rural development programmes viz; National Horticulture Mission, National Bamboo Mission, MNREGA etc. are necessary to make the use of barren and uncultivable land for cultivation, for holistic rural development, natural resource management, and eco-restoration. A suitable institutional mechanism for scientific management of land use with the efforts from all the stakeholders is also the need of the hour.