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ANALYSIS OF LAND USE PATTERN IN INDIA

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Land is a crucial natural resource and an important determinant of a country's socio-economic and ecological health. Given the finite supply of land resource, sustainable use and management of land resources is a necessity for the well-being of people of a country. Like any other resource land has two dimensions, viz., quality and quantity, and both of these crucial aspects are under serious threat due to the intensive and extensive use of land both for agricultural and non-agricultural purposes(Ramasamy *et al.*, 2005). The layout or arrangement of the uses of the land is known as "land use pattern". With the rapid increase in population and development of urbanisation, the growing demand for resources, especially for cultivated land resources, has led to the conversion among different land uses (Bakker *et al*., 2009). In India, the pressure exerted by the growing economy on land and other natural resources have intensified in post-liberalisation period and in the phase of burgeoning population the demand for the conversion of farm land for non-agricultural uses increases (Bardhan *et al*.,2010). Despite the fact that conversion of farm land has serious implication on national food security, ecological security, as well as sustainable land resource use, the conversion of farm land for non-agricultural purposes is continuing in India (Manikandan, 2016).

Land-use change has broad lines of impact, with a potential for influencing economic growth, quality of life, management of environmental resources, and national food supply. FAO defines the land use as "the human activities which are directly related to land, making use of its resources, or having an impact on them". Land use pattern is the layout or arrangement of the uses of the land. The land may be used for agriculture, forest, pasture etc. Simply it is the "The management of land to meet human needs".

Evolution of Land Use Statistics

- The evolution of land-use statistics in India dates back to 1866 when the British administration took interest in the compilation of land data to enhance its revenue collection.
- The recommendations of the Royal Commission on Agriculture in 1928 further strengthened the statistical system and increased the coverage.
- The need for reliable data on area under food crops and food production was felt when there was shortage of food and the great famine of India just after the Second World War.
- The statistical system of the erstwhile British era identified 5 board indicators like 1) Forest, 2) area not available for cultivation, 3) other uncultivated land excluding current fallows, 4) fallow land and 5) net area sown.
- A "Technical Committee on Coordination of Agricultural Statistics" constituted by the Ministry of Agriculture in 1949 suggested to add four more categories to make it a 9-fold classification of the total land available.
- Those nine categories also have some deficiencies like we will not get the information on land under socially forestry, marshy land etc, which are actually important for local development plans. So there are suggestions to enlarge these 9 categories too.

Table 1: Land Use Classification

Sl. No	Category	Definition
1	Forest	All area classed as forests under any legal enactment or administered as forests, whether State- owned or private.
2	Land put to non-agricultural uses	All lands occupied by buildings, roads, railway, under water e.g. rivers, canals, etc
3	Barren and uncultivable land	Land under mountain, desert, etc
4	Permanent pastures and other grazing land	All pastures and grazing lands permanent or not
5	Land under miscellaneous tree crop	All cultivated land which is not included under 'net area sown' but put to some agril. uses (bamboo bushes, thatching grasses and other grooves)
6	Cultivable waste	Land available for cultivation whether taken up or not taken up for cultivation once, but not cultivated during last 5 years or more in succession.
7	Fallow other than current fallow	All land which was taken up for cultivation but is temporarily out of cultivation for a period of not less than 1 year and not more than 5 years.
8	Current fallow	Cropped area which is kept fallow during the current year
9	Net area sown	Area sown with crops and orchards etc.

For simplicity, 1) Area under non-agricultural use 2) Barren and uncultivable land are together called as "Area Not Available for Cultivation " and 1)Permanent pasture 2) Land under miscellaneous tree crop 3) Cultivable waste are called as "Other uncultivated land excluding fallow land".

India which is the seventh-largest country with an area = 3,287,263 sq.km, occupies 2.4 % of the total land area of the world and supports 18 percent of the world population. Out of a geographical area of 329 million hectares (ha), statistics are available only for 305-307 million ha which makes some areas to the extent of 7% still not covered or classifiable under the nine-fold classification. Because for some parts of Arunachal Pradesh data is not available due to issues with China and also for parts of Jammu and Kashmir due to issues with Pakistan.

When we compare some parameters between years just after the independence and for now like Population density(people per square km) was 114.48 in 1950 and now it is 423.8, Per capita availability of agricultural land was 0.48 ha in 1950 and now it is 0.12ha. This shows that how crucial the land is becoming year to year.

Importance of Studying the Land Use Pattern

- It is a source of information for planning of agricultural production.
- It helps in assessing direction & extent of land utilisation.
- To frame policies to regulate land use.
- An analysis of structural changes in land use pattern over the period of time provides the scope for planned and judicial management of land.

Table 2: Land use pattern in India ('000 ha)

Land use category	1980-81	1995-96	2019-2020
Area under forest	67,460 (22.18)	68,817 (22.57)	71,750.9 (23.41)
Barren and uncultivable lands	19,958 (6.56)	19,009 (6.24)	16,541.6 (5.40)
Land put to non-agricultural uses	19,596 (6.44)	22,362 (7.33)	27,777.2 (9.06)
Permanent pastures and other grazing lands	11,989 (3.94)	11,064 (3.63)	10,479.8 (3.42)
Cultivable wastes	16,744 (5.51)	14,098 (4.62)	11,945.3 (3.90)
Miscellaneous tree crops	3578	3481	3,133.9

and groves	(1.18)	(1.14)	(1.02)
Current fallows	14,826 (4.87)	13,831 (4.54)	13,769.5 (4.49)
Fallows other than current fallow	9720 (3.20)	10,016 (3.29)	11,242.2 (3.67)
Net area sown	1,40,288 (46.12)	1,42,197 (46.64)	139,902.3 (45.64)
Total reported area	**3,04,159 (100.00)**	**3,04,875 (100.00)**	**306,542.8 (100.00)**

Note: Figures in parentheses indicate percentages to the total reported area
Source: Directorate of economics and statistics, MoAFW, GOI.

The share of "Area under non-agricultural use" has seen a drastic increase from 6.4% in 1980-81 to 9.1% in 2019-20, owing to rapid industrialization and urbanization. Whereas, the share of area under "cultivable wastes" has decreased.

State Wise Scenario of Land Use

Among all states Madhya Pradesh has the largest forest cover in the country with a share of 12.09 %, the thing that is helping the state to conserve its forest resource is "Joint Forest Management". For most of the remaining land use categories, Rajasthan has the highest share among all states since it is the largest state and we did not give consideration to the size of the state in this calculation.

Estimation of Location Coefficient

Location coefficient (L) is useful to identify the pattern of distribution of the given category of land across different regions of a country or state. This is defined as follows:

$$L = \frac{Lij \,/\, Li}{Lj \,/\, Ls}$$

Where Lij = area of j^{th} category of land in i^{th} State,

Li = area of all categories of land in the State (Reported area of the state).

Lj = area of j^{th} category of land in the country,

Ls = area of all categories of land in the country (Reported area of the country).

- A higher value for location coefficient for a State or region indicates the higher concentration of that particular category of land in that district or the region.

Table 3: Location Coefficient

States/Category	Forest	Not available for cultivation	Other uncultivated land excluding Fallow Land	Fallow Lands	NSA
Arunachal Pradesh	**3.97**	0.06	0.19	0.16	0.07
Chandigarh	0.94	**4.07**	0.23	0.14	0.28
Himachal Pradesh	1.05	1.71	**4.42**	0.27	0.25
Jharkhand	1.20	1.15	0.97	**3.81**	0.36
Punjab	0.21	0.75	0.05	0.23	**1.80**

Author's calculation
Source: Directorate of economics and statistics, MoAFW, GOI.

This calculation shows that Forest is highly concentrated in Arunachal Pradesh with Location coefficient value of 3.97, least concentrated in Punjab with L.C value 0.21.Area not available for cultivation is highly concentrated in Chandigarh and less concentrated in Arunachal Pradesh. Other uncultivated land excluding fallow land is highly concentrated in Himachal Pradesh and less in Punjab. Similarly, fallow land is highly concentrated in Jharkhand and less in Chandigarh and net sown area is highly concentrated in Punjab and less in Arunachal Pradesh.

Conclusion

Land is the basic resource; its allocation depends on population, technological changes and pace of economic development. From calculation it has been found that, land put to non-agricultural uses and fallow lands have shown a rising trend while net sown area is decreasing. Land use provides many economic & social benefits but at a substantial cost to the environment. With the increasing pressure of population, the only prospect of increasing food grain production and meeting the needs of food lie in expansion of cultivated area, reduction of fallow land, increase in net sown area and enhancing per unit yield of crops.

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