1. Details of Module and its structure

Module Detail	
Subject Name	Geography
Course Name	Geography 04 (Class XII, Semester - 2)
Module Name/Title	Land resources and Agriculture – Part 1
Module Id	legy_20501
Pre-requisites	Relief features, resource planning, barren and wasteland, population density, land use, private land, community property resources.
Objectives	After reading this lesson, learners will be able to: • Identify the importance of the different relief features in the country. • Know why the Land is called a resource. • Analyse the land use survey in India. • Know the meaning of land use pattern. • Understand the different land use pattern in the country. • Evaluate the factors affecting the land use. • Know about the land use changes in India. • Differentiate between private land and common property resources. • Calculate the cropping intensity.
Keywords	Relief features, Land resource, land use, land use survey, Land Revenue Records, culturable wasteland, fallow land, current fallow land, net sown area, gross cropped area, cropping intensity.

2. Development Team

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Land Resources and Agriculture

Do you know what kind of terrain you live in? Have you ever noticed the different purposes for which land is used in your area? Try to compare the land use of your area with some other area. Different types of lands are suited to different uses. Human beings thus, use land as a resource for production as well as residence and recreation. Thus, the building of your school, roads on which you travel, parks in which you play, fields in which crops are grown and the pastures where animals graze represent different uses to which land is put.

Land as a resource

We live on land, we perform our economic activities on land and we use it in different ways. Thus, land is a natural resource of utmost importance. It supports natural vegetation, wild life, human life, economic activities, and transport and communication systems. However, land is an asset of a finite magnitude, therefore, it is important to use the available land for various purposes with careful planning.

India has land under a variety of relief features, namely; mountains, plateaus, plains and islands.

a) About 43 per cent of the land area is plain, which provides facilities for agriculture and industry.
b) Mountains account for 30 per cent of the total surface area of the country and ensure perennial flow of some rivers, provide facilities for tourism and ecological aspects.
c) About 27 per cent of the area of the country is the plateau region. It possesses rich reserves of minerals, fossil fuels and forests. It is also called the storehouse of minerals.
d) The coastal region and island groups provide sites for fishing and port activities. Thus, the diverse physical features of the land have immense future possibilities of development.

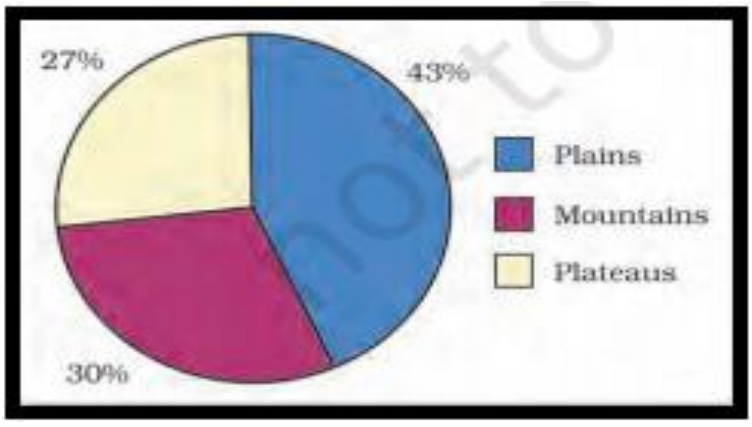


Image: Land under important relief features

Sources: NCERT Textbook

Land use survey in India

Total geographical area of India is 3.28 million sq. km. Land use data, however, is available only for 93 per cent of the total geographical area because the land use reporting for most of the north-east states except Assam has not been done fully. Moreover, some areas of Jammu and Kashmir occupied by Pakistan and China have also not been surveyed.

Image: Department of Revenue

Source: https://commons.wikimedia.org/wiki/File:Income_Tax_Deoartment.JPG

Land-use records are maintained by land revenue department. The land use categories add up to reporting area, which is somewhat different from the geographical area. The Survey of India is responsible for measuring geographical area of administrative units in India. Have you ever used a map prepared by Survey of India? The difference between the two concepts are that while the former changes somewhat depending on the estimates of the land revenue records, the latter does not change and stays fixed as per Survey of India measurements.

Land Use Categories

Land is used for different purposes such as agriculture, forestry, mining, building houses, roads and setting up of industries. This is commonly termed as Land use. The land-use categories as maintained in the Land Revenue Records are as follows:

(i) **Forests**: It is important to note that area under actual forest cover is different from area classified as forest. The latter is the area which the Government has identified and demarcated for forest growth. The land revenue records are consistent with the latter definition. Thus, there may be an increase in this category without any increase in the actual forest cover.

Image: Forest land

Source:https://commons.wikimedia.org/wiki/File:Nature_Forests_Rivers_Cherrapunjee_Landscape_Meghalaya_India.jpg

(ii) **Barren and Wastelands:** The land which may be classified as a wasteland such as barren hilly terrains, desert lands, ravines, etc. normally cannot be brought under cultivation with the available technology.

Image: Barren and wasteland

Source:https://commons.wikimedia.org/wiki/File:Barren_salt_flats_on_road_to_Zyzzyx_-_panoramio.jpg

(iii) **Land put to Non-agricultural Uses:** Land under settlements (rural and urban), infrastructure (roads, canals, etc.), industries, shops, etc., are included in this category. An expansion in the secondary and tertiary activities would lead to an increase in this category of land-use.

(iv) **Area under Permanent Pastures and Grazing Lands:** Most of this type land is owned by the village 'Panchayat' or the Government. Only a small proportion of this land is privately owned. The land owned by the village panchayat comes under 'Common Property Resources'.

Image: Common grazing ground

Source: https://www.pxfuel.com/en/free-photo-qsbzo

(v) **Area under Miscellaneous Tree Crops and Groves (Not included in Net sown Area):** The land under orchards and fruit trees are included in this category. Much of this land is privately owned.

(vi) **Culturable Wasteland:** Any land which is left fallow (uncultivated) for more than five years is included in this category. It can be brought under cultivation after improving it through reclamation practices.

(vii) **Current Fallow:** This is the land which is left without cultivation for one or less than one agricultural year. Following is a cultural practice adopted for giving the land rest. The land recoups the lost fertility through natural processes.

Image: Fallow land

Source:https://commons.wikimedia.org/wiki/File:A_Fallow_Field_-_geograph.org.uk_-_202541.jpg

(viii) **Fallow other than Current Fallow:** This is also a cultivable land which is left uncultivated for more than a year but less than five years. If the land is left uncultivated for more than five years, it would be categorised as Culturable wasteland.

(ix) **Net Area Sown:** The physical extent of land on which crops are sown and harvested is known as net sown area.

Image: Net sown area

Source:https://www.needpix.com/photo/1389272/farmland-farm-field-farming-green-tractor-crops-cropspraying-rural

(x) **Gross cropped area:** Area sown more than once in an agricultural year plus net sown area is known as gross cropped area.

Factors affecting land use

The use of land is determined both by physical factors and human factors. The important physical factors determining the use of land are topography, climate, soil types, minerals, availability of water etc. The human factors that affects the use of land are population density, technological capability and culture and traditions etc.

1. **Physical factors:**
   a) **Topography:** It means the landscape or terrain. Different regions on the earth are blessed with different landscape such as mountains, plains, plateaus, Islands etc. All these different topographical units supports different types of land use. For example in the plain areas the land use is dominated by the agricultural and pasture lands, in the mountainous areas it is dominated by the forest land and so on.

Image: Topography

Source: https://commons.wikimedia.org/wiki/File:Landscape_of_Bhutan_01.jpg

   b) **Climate:** As we know that there are different climatic regions in the world where we can observe perceptible variations in terms of the elements of the climate. It

means temperature, precipitation, humidity, wind and pressure conditions are different at different places and that too affects the land use pattern at large scale.

c) **Soil types:** India is endowed with different soil types. Different soils have different fertility levels and that determines the use of the land in that area. Such as it would be used for commercial agriculture or pasture land or barren land depending on its fertility.

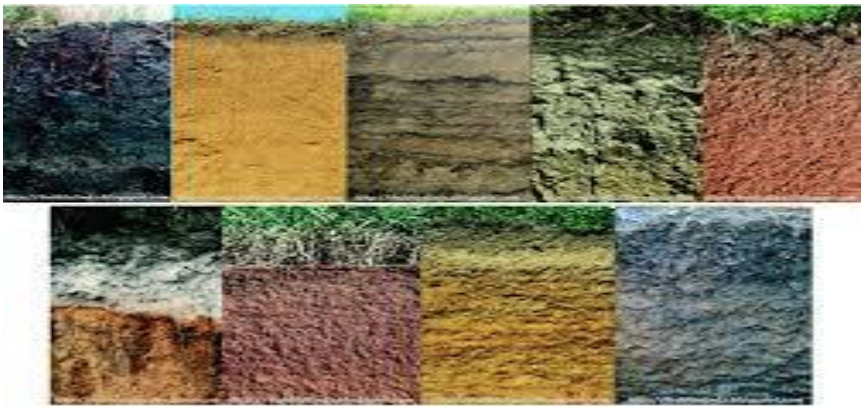


Image: Different soil types

Source: https://pixy.org/654942/

d) **Minerals:** The availability of minerals at a particular place will decide that the land near the mineral source would be used for what kind of economic activities. Mostly near to the source of the mineral deposits land is devoted for setting up of industries.

Image: Mineral extraction

Source:https://www.needpix.com/photo/download/1139564/mine-extraction-coal-coal-mining-industry-mines-giant-machine-surface-work

e) **Availability of water:** The entire human life and activities are dependent on the availability of water. You have earlier read that it was the availability of water that gave rise to many civilisations, agricultural activities and even most of the industrial units set up near to the available sources of water.

Image: Agricultural fields near river

Source: https://commons.wikimedia.org/wiki/File:Tigris_River_At_Diyarbakir.JPG

2. **Human factors:**

   a) **Population density:** It is calculated as the number of persons per square kilometer. Population density has a significant impact on the use of land. Due to the high population density there is gradual decline in the forest areas, and increase in cultivable land and high rise buildings in the urban areas may be seen. Intensive subsistence farming has been the result of this high density of population.

   b) **Technological capability**: Land use and technological capabilities are strongly related with each other as it can be seen in the history. The natural environment continued to be managed and modified to arable land, pasture land, settlement, industries and many more. Due to the technological advancement in the modern period surveying and mapping of areas have become easier and subsequently plan a sustainable land use.

   c) **Culture and traditions:** Before the introduction of modern agricultural inputs, people were fully dependent on the natural resources. Even today such cultural and traditional practices can be found in some areas. In case of agriculture, the practice of shifting cultivation can be seen in few pockets of India. Forest communities and communities dependent on livestock's have their own set of land use.

Land-use Changes in India

Land-use in a region, to a large extent, is influenced by the nature of economic activities carried out in that region. However, while economic activities change over time, land, like many other natural resources, is fixed in terms of its area. At this stage, one needs to appreciate three types of changes that an economy undergoes, which affect land-use.

(i) **The size of the economy** (measured in terms of value for all the goods and services produced in the economy) grows over time as a result of increasing population, change in income levels, available technology and associated factors. As a result,

the pressure on land will increase with time and marginal lands would come under use.

(ii) Secondly, **the composition of the economy** would undergo a change over time. In other words, the secondary and the tertiary sectors usually grow much faster than the primary sector, specifically the agricultural sector. This type of change is common in developing countries, like India. This process would result in a gradual shift of land from agricultural uses to non-agricultural uses. You would observe that such changes are common around large urban areas. The agricultural land is being used for building purposes.

(iii) Thirdly, though the **contribution of the agricultural activities** reduces over time, the pressure on land for agricultural activities does not decline. The reasons for continued pressure on agricultural land are:

(a) In developing countries, the share of population dependent on agriculture usually declines much more slowly compared to the decline in the sector's share in GDP.

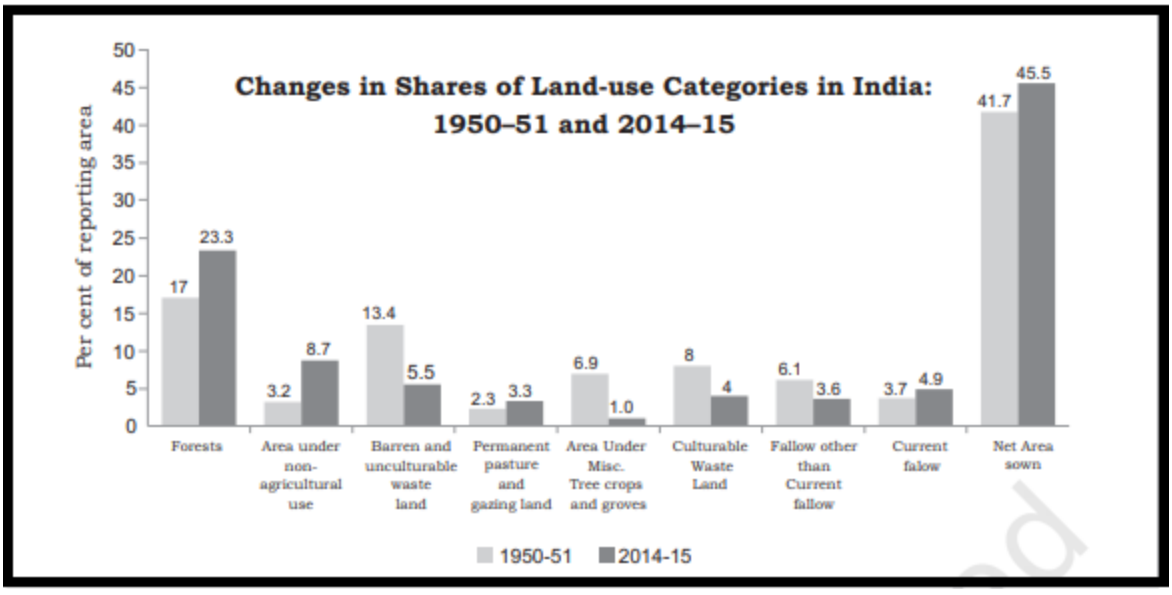
(b) The number of people that the agricultural sector has to feed keeps increasing.

Now let us check the following graph and Compare the changes of land-use between 1950–51 and 2014–15.

India has undergone major changes within the economy over the past four or five decades, and this has influenced the land-use changes in the country. These changes between 1950–51 and 2014–15 have been shown in the following figure. There are two points that you need to remember before you derive some meaning from this figure.

First, the percentages shown in the figure have been derived with respect to the reporting area.

Second, since even the reporting area has been relatively constant over the years, a decline in one category usually leads to an increase in some other category.



Four categories have of land use have risen over this time period, while four have registered decline. Share of area under forest, area under non-agricultural uses, current fallow lands and net area sown have shown an increase. The following observations can be made about these increases:

(i) The rate of increase is the highest in case of area under non-agricultural uses. This is due to the changing structure of Indian economy, which is increasingly depending on the contribution from industrial and services sectors and expansion of related infrastructural facilities. Also, an expansion of area under both urban and rural settlements has added to the increase in this category. Thus, the area under non-agricultural uses is increasing at the expense of wastelands and agricultural land.

(ii) The increase in the share under forest, as explained before, can be accounted for by increase in the demarcated area under forest rather than an actual increase in the forest cover in the country.

(iii) The increase in the current fallow cannot be explained from information pertaining to only two points. The trend of current fallow fluctuates a great deal over years, depending on the variability of rainfall and cropping cycles.

(iv) The increase in net area sown is a recent phenomenon due to use of culturable waste land for agricultural purpose. Before which it was registering a slow decrease. There are indications that most of the decline had occurred due to the increases in area under nonagricultural use. (Note: the expansion of building activity on agricultural land in your village and city).

The four categories that have registered a decline are barren and wasteland, culturable wasteland, area under pastures and tree crops and fallow lands. The following explanations can be given for the declining trends:

(i) As the pressure on land increased, both from the agricultural and nonagricultural sectors, the wastelands and culturable wastelands have witnessed decline over time.

(ii) The decline in land under pastures and grazing lands can be explained by pressure from agricultural land. Illegal encroachment due to expansion of cultivation on common pasture lands is largely responsible for this decline.

Now let us try to understand the difference between actual increase and rate of increase.

For calculating actual increase, the difference of the land-use categories should be worked out over the two periods.

For deriving the rate of increase, simple growth rate i.e. (difference of values between the two time points i.e. value of terminal year minus base year / base year or 1960-61 value) should be used, e.g. 100 Net sown Area in 2014–15 Net sown Area in 1950–51 Net sown Area in 1950–51.

Talk to some elderly person in your family or neighborhood and collect information about changes in the land use over the years, in the place where you live.

Common Property Resources

Land, according to its ownership can broadly be classified under two broad heads –

a) Private land and
b) Common Property Resources (CPRs).

While the former is owned by an individual or a group of individuals, the latter is owned by the state meant for the use of the community. CPRs provide fodder for the livestock and fuel for the households along with other minor forest products like fruits, nuts, fibre, medicinal plants, etc.

Image: Private land

Source: https://www.pikrepo.com/fhvek/fence-house-private-property-estate-home-sign-land-landscape-farm

Image: Common property resources

Source: https://www.pikrepo.com/fcqsx/a-sunny-day-at-the-park

In rural areas, such land is of particular relevance for the livelihood of the landless and marginal farmers and other weaker sections since many of them depend on income from their livestock due to the fact that they have limited access to land.

CPRs also are important for women as most of the fodder and fuel collection is done by them in rural areas. They have to devote long hours in collecting fuel and fodder from a degraded area of CPR.

CPRs can be defined as community's natural resource, where every member has the right of access and usage with specified obligations, without anybody having property rights over them. Community forests, pasture lands, village water bodies and other public spaces where a group larger than a household or family unit exercises rights of use and carries responsibility of management are examples of CPRs.

Agricultural Land Use in India

Land resource is more crucial to the livelihood of the people depending on agriculture:

(i) Agriculture is a purely land based activity unlike secondary and tertiary activities. In other words, contribution of land in agricultural output is more compared to its contribution in the outputs in the other sectors. Thus, lack of access to land is directly correlated with incidence of poverty in rural areas.

(ii) Quality of land has a direct bearing on the productivity of agriculture, which is not true for other activities.

(iii) In rural areas, aside from its value as a productive factor, land ownership has a social value and serves as a security for credit, natural hazards or life contingencies, and also adds to the social status.

An estimation of the total stock of agricultural land resources (i.e. total cultivable land) can be arrived at by adding up net sown area, all fallow lands and culturable wasteland. It may be observed from the following table that over the years, there has been a marginal decline in the available total stock of cultivable land as a percentage to total reporting area. There has been a greater decline of cultivated land, in spite of a corresponding decline of cultivable wasteland.

Table: Composition of Total Cultivable Land

Agricultural land use categories	**As a percentage of reporting area**		**As a percentage of total cultivable land**	
	1950-51	**2014-15**	**1950-51**	**2014-15**
Culturable Waste land	8.0	4.0	13.4	6.8
Fallow other than Current Fallow	6.1	3.6	10.2	6.2
Current Fallow	3.7	4.9	6.2	8.4
Net Area Sown	41.7	45.5	70.0	78.4
Total Cultivable Land	59.5	58.0	100.00	100.00

It is clear from the above discussion that the scope for bringing in additional land under net sown area in India is limited. There is, thus, an urgent need to evolve and adopt land-saving technologies.

Such technologies can be classified under two heads –

a) Those which raise the yield of any particular crop per unit area of land and

b) Those which increase the total output per unit area of land from all crops grown over one agricultural year by increasing land-use intensity.

The advantage of the latter kind of technology is that along with increasing output from limited land, it also increases the demand for labour significantly. For a land scarce but labour abundant country like India, a high cropping intensity is desirable not only for fuller utilisation of land resource, but also for reducing unemployment in the rural economy.

The cropping intensity (CI) is calculated as follows:

Cropping Intensity in percentage=GCA/NSA x 100

Here, GCA means Gross cropped area and NSA means Net sown area.

Conclusion

In the end of this module it can be concluded that land is an asset of a finite magnitude. India is endowed with diverse relief features and population that determines the land use pattern of the country. Over the years changes in the land use can be noticed throughout the country due to various reasons. We need to appraise these changes and find that these changes are sustainable or not.