
Land
Resources
...make everyday Earthday !!!

ANUJ SINGH 13BBAH022

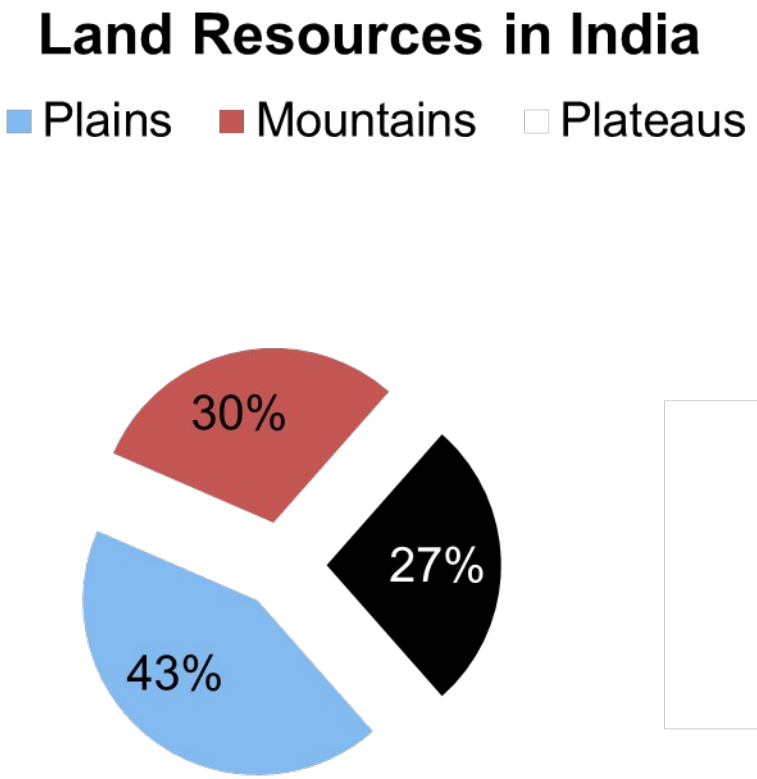
What are Land Resources ??

In the direct words 'Natural resource in the form of arable land.'

Land is among the most important natural resources. It covers up only 29% of the earth's surface and all parts of the land are not habitable. The uneven distribution of population in different parts of the world is mainly due to varied characteristics of land and climate.

Land resources in India

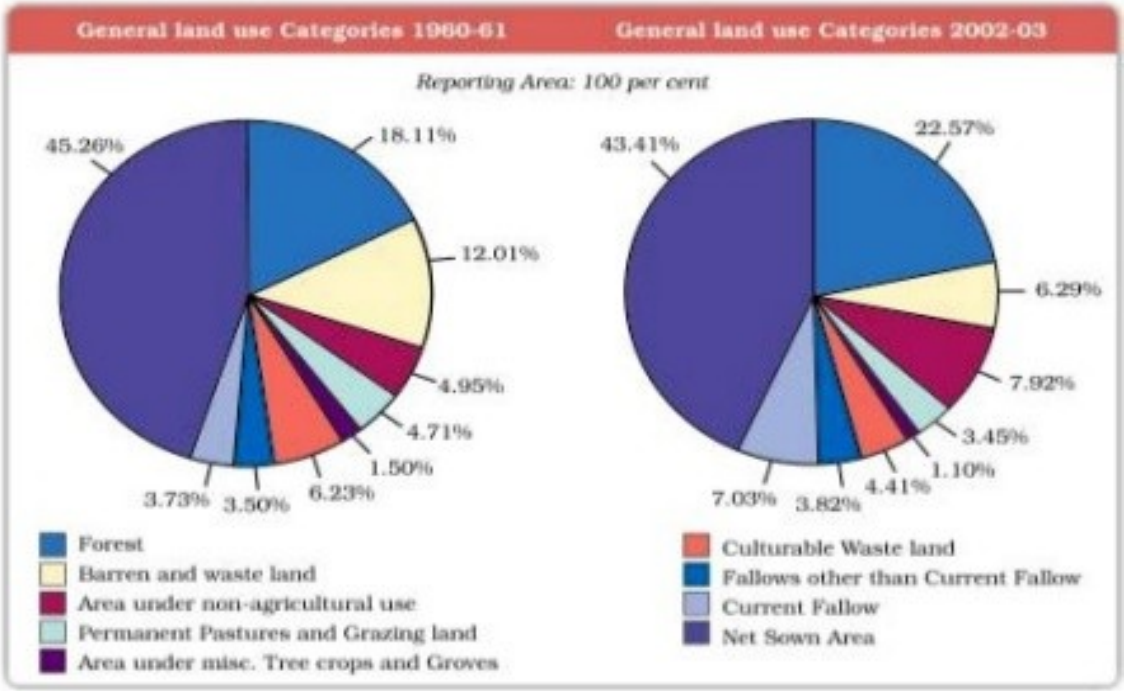
- Land Resources in India enclose approximately 1.3 million sq. miles and is a cape, protruding into the Indian Ocean, in between the Bay of Bengal on the east and Arabian Sea on the west. Indian land resources are segmented into varied relief features, 43% of land area is plain region; Indian mountain region constitutes 30% of the area, where as plateaus account for 27 % of the total surface area on the nation.



Land Use patterns in India

Land resources are used for the following purposes:

1. Forests
2. Land not available for cultivation
   (a) Barren and waste land
   (b) Land put to non-agricultural uses
3. Other uncultivated land
   (a) Permanent pastures and grazing land,
   (b) Land under miscellaneous tree crops
   (c) Cultruable waste land
4. Fallow lands
   (a) Current fallow
   (b) Other than current fallow
5. Net sown area



Land not available for cultivation

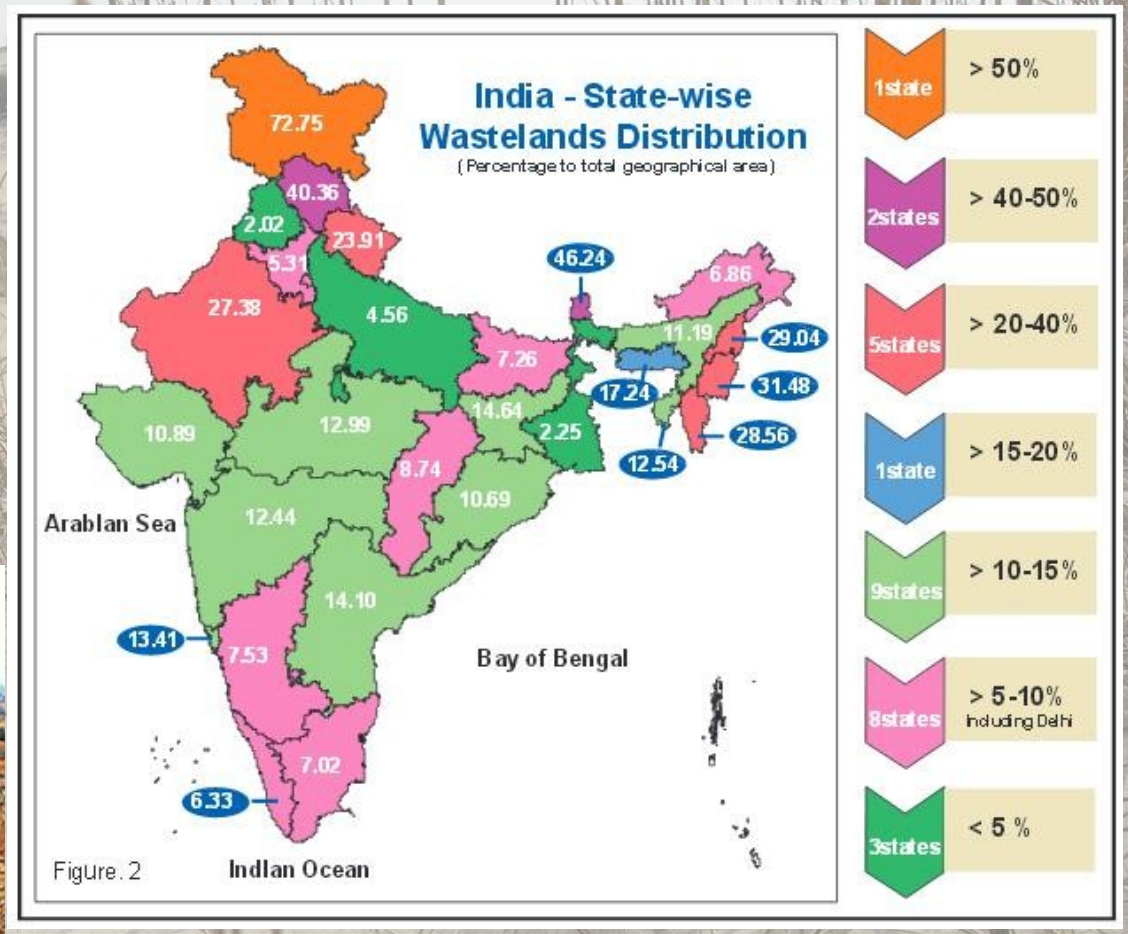


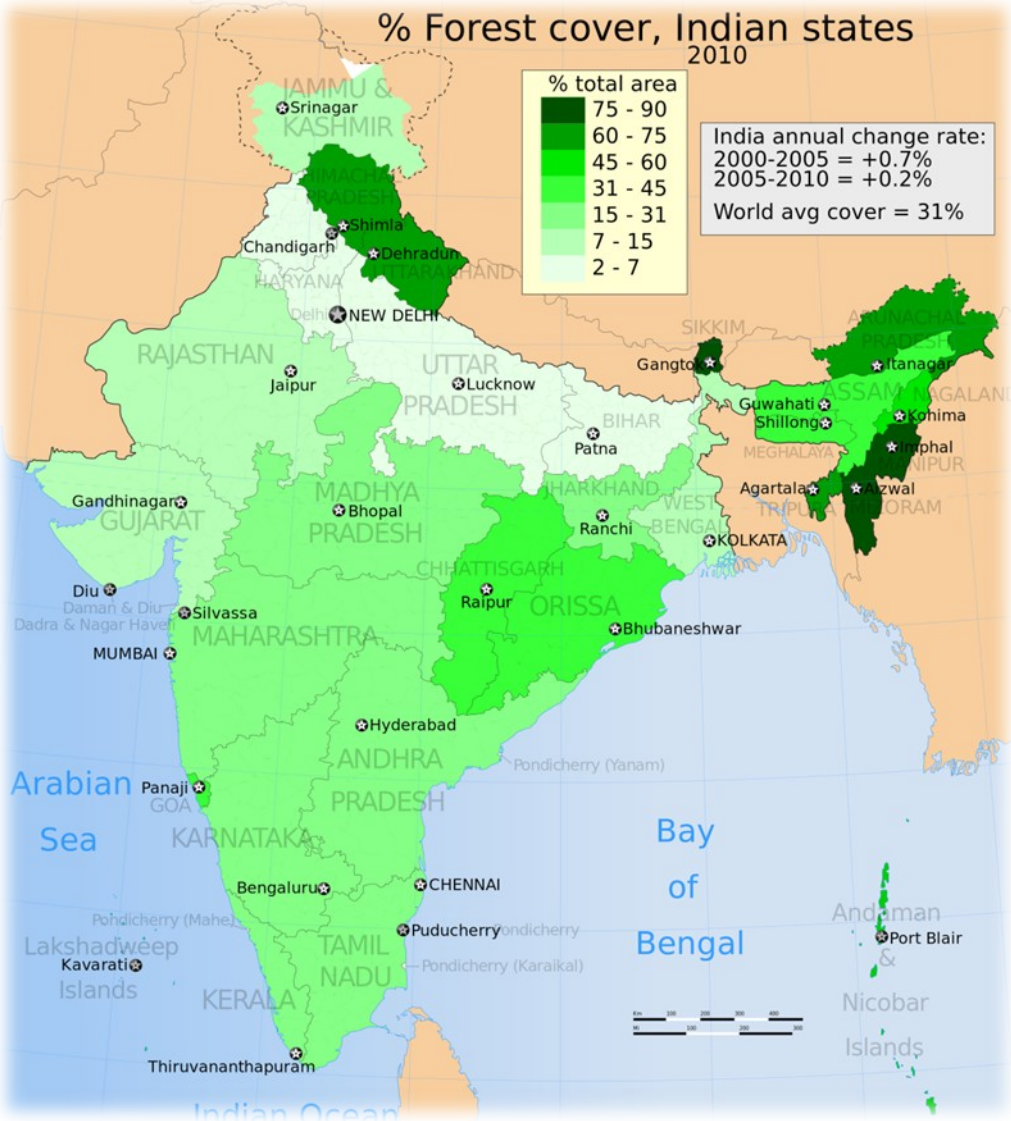
Figure. 2

Pastures & Grazing lands

- According to the National Sample Survey Organisation, common property land resources constitute about 15% of the total geographical area of India, of which 23% is community pasture and grazing lands and 16% have been classified as village forests and woodlots.
- At another level, India has the largest livestock population in the world, with 485 million head of livestock, many of them raised by small and marginal farmers who depend on grazing land to meet the fodder requirements of their animals.
- As the population of both animals and humans rises, there will be a proportional increase in competition for food to feed humans, bringing agriculture and livestock production into direct conflict.

Forests in India

As of 2010, the Food and Agriculture Organisation of the United Nations estimates India's forest cover to be about 68 million hectares, or 24% of the country's area.The 2013 Forest Survey of India states its forest cover increased to 69.8 million hectares by 2012, per satellite measurements; this represents an increase of 5,871 square kilometers of forest cover in 2 years. However, the gains were primarily in northern, central and southern Indian states, while northeastern states witnessed a net loss in forest cover over 2010 to 2012.



Uses of Land

Agriculture in India

As Per the 2010 FAO world agriculture statistics, India is the world's largest producer of many fresh fruits and vegetables, milk, majorspices, select fresh meats, select fibrous crops such as jute, several staples such as millets and castor oil seed. India is the second largest producer of wheat and rice, the world's major food staples. India is also the world's second or third largest producer of several dry fruits, agriculture-based textile raw materials, roots and tuber crops, pulses, farmed fish, eggs, coconut, sugarcane and numerous vegetables. India ranked within the world's five largest producers of over 80% of agricultural produce items, including many cash crops such as coffee and cotton, in 2010. India is also one of the world's five largest producers of livestock and poultry meat, with one of the fastest growth rates, as of 2011.

Grain Production in India

- One report from 2008 claimed India's population is growing faster than its ability to produce rice and wheat.[7] Other recent studies claim India can easily feed its growing population, plus produce wheat and rice for global exports, if it can reduce food staple spoilage, improve its infrastructure and raise its farm productivity to those achieved by other developing countries such as Brazil and China.
- India exported around 2 million metric tonnes of wheat and 2.1 million metric tonnes of rice in 2011 to Africa, Nepal, Bangladesh and other regions around the world.

India's Agricultual Production

Crops	2nd Advance Estimates 2010-11	Target 2010-11	Percentage of 2010-11 production to target set for 2010-11
Rice	94.01	102.00	92.17
Wheat	81.47	82.00	99.35
Coarse Cereals	40.08	44.00	91.09
Pulses	16.51	16.50	100.06
Total Foodgrains	232.07	244.50	94.92
Oilseeds	27.85	33.20	83.89
Sugarcane	336.70	315.00	106.89
Cotton*	33.93	26.00	130.50
Jute and Mesta**	10.08	11.50	87.65

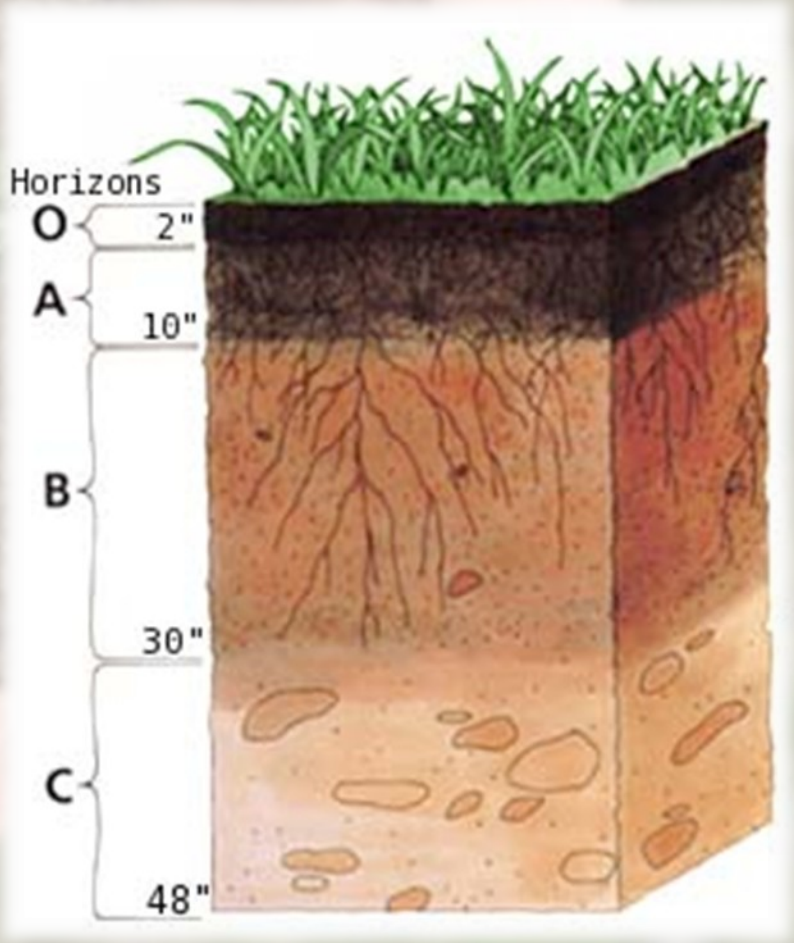
Notes : *million bales of 170 kg each **million bales of 180 kg each

SOIL....as a resource

- The soil consists of a mixture of solid particles, water and air. Solid particles can be inorganic or organic. The inorganic parts are mainly minerals: silicates, oxides and hydroxides of iron, aluminium, manganese, etc. that, according to their dimension, are classified in skeleton and fine earth, which are then divided into sand, slime and clay.
- Water and air occupy the free spaces between solid particles (pores), and form a thick and extended network that allows water to move in the ground..

Soil Structure

- When the soil is not removed, the so-called mature soil develops. Paedogenesis is the name of the process that leads to its creation.
  A mature soil is characterized by a series of layers, called horizons, which differ according to the soil structure and the composition of organic and inorganic parts.
  The layers create the soil profile:
- **Horizon A**: rich in organic components, but lacks clay particles. Clay particles are transported by the water to the underneath horizons.
  Horizon B: lacks organic material, but is rich in clay particles.
  Horizon C: has particles of real soil and fragments of rock that have not been changed yet. More deeply, unchanged rocks can be found.



Soil Erosion…

- Soil erosion is a naturally occurring process that affects all landforms. In agriculture, soil erosion refers to the wearing away of a field's topsoil by the natural physical forces of water.
- Erosion, whether it is by water, wind or tillage, involves three distinct actions – soil detachment, movement and deposition. Topsoil, which is high in organic matter, fertility and soil life, is relocated elsewhere "on-site" where it builds up over time or is carried "off-site" where it fills in drainage channels.

Causes of Erosion

The main cause of soil erosion is the removal of vegetation. Vegetation removal takes place due to removal of forest covers. Unscientific farming has also led to barren lands. The removal of vegetation exposes the topsoil to water and wind. Water and wind cause the topsoil to be removed.

Water Erosion: Removal of topsoil by water is called water erosion. It takes place in the following ways:

- Sheet erosion
- Rill erosion
- Gully erosion
- Riparian erosion
- Wind erosion

Sheet Erosion

The removal of the entire topsoil as a result of heavy rains is called sheet erosion.

Rill Erosion

Runoff water moves across the soil forming small streams. The topsoil is removed only in these rills formed by the water streams.

Gully Erosion

Deep depressions called the gullies are formed by swiftly moving waters causing soil erosion by them.

Riparian Erosion

The banks of rivers lose top soil due to the action of the fast moving rivers waters. These waters remove the underlying soil and this results in the loss of topsoil.

Prevention & Control of Soil Erosion

Increase of Vegetation

•When the land is covered with vegetation, the roots of the plants and trees interlock and interlace to bind the soil particles. This helps in two ways:

•does not allow the soil particles to be carried away by wind or water

•does not allow free flow of water over the soil which prevent erosion of soil by flowing water

•the falling leaves of the plants get converted to humus by decomposing action of the soil microbes. This enriches the soil.

•Several methods can be employed to increase the vegetation cover of land. Some of them are as follows:

Crop Rotation

The practice of growing different crops at different times on the same land is called crop rotation. This keeps the topsoil covered with vegetation. Rotation of cereal crops with legumes also keeps the soil enriched with nitrogen (from the legumes).

Reforestation

Slopes are more subject to soil erosion by running water. Growing trees on lands which have lost their vegetation is called reforestation. Trees like Albizia, Cassia, Butia, etc. are suitable for this.

……cont

- **Strip Cropping**

It involves growing of crops in strips. The most common method followed is the contour farming where the strips of crop are at right angles to the slope. Wind-strip cropping is when the strips of crop are place at right angles to the direction of wind.

- **Restoring Soil Fertility**

Fertile soil supports vegetation. Loss of fertility results in loss of vegetation and this exposes the land to erosion. Fertility of soil can be increased by addition of natural and synthetic fertilizers.

- **Control of Grazing**

Covering the land with small plants and grasses helps the topsoil to remain in place as the roots of these plants bind with the soil particles. Cattle graze on these plants and expose the topsoil Thus, grazing should be allowed only on the land meant for the purpose and other areas should be protected from grazing.

- **Terracing**

Fields are cut at right angles to the slope. This slows down the flowing water and allows it to irrigate the crops, as well.

- **Dam Building**

With the dams the speed and amount of water flowing can be controlled. This will control the soil erosion of the river banks.

- **Wind Breakers**

Trees are planted across the wind direction to protect against the high velocity winds. These rows of trees are called shelter belts or wind breakers

Water...as resource

Water is a transparent fluid which forms the world's streams, lakes, oceans and rain, and is the major constituent of the fluids of living things. As a chemical compound, a water molecule contains one oxygen and two hydrogen atoms that are connected by covalent bonds. Water is a liquid at standard ambient temperature and pressure, but it often co-exists on Earth with its solid state, ice; and gaseous state,steam (water vapor). It also exists as snow, fog, dew and cloud.

Human uses of Water

- Agriculture
- Drinking
- Washing
- Transportation
- Recreation
- Chemical use
- Heat exchange
- Fire extinction
- Food processing

THANK YOU