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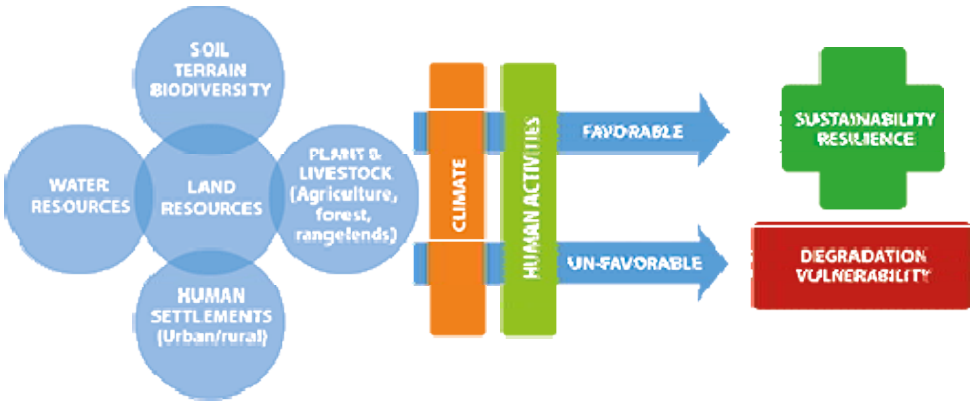
Land and water management - land use, minimum tillage

Land use:-



Land is the most vital resource of a country. It is a fixed asset and cannot be expanded to meetthe needs of an increasing population. Therefore, it must be used carefully and in the best possible manner. The total geographical area of India is 32.88 lakh sq. kms. The major land uses in India are:

Net Sown Area (NSA)

The total land area on which crops are grown in a region is called net sown area. Thenet sown area and the area sown more than once together are called gross cultivated area. InIndia, about 47 per cent of total reporting area is under the net sown area.

States namely Punjab, Haryana, West Bengal, Uttar Pradesh, have the high proportional share of NSA than the national average. Against this, the share of NSA is less than one half of the national average in states of Himachal Pradesh, Uttarakhand, Meghalaya, Manipur, Nagaland, Mizoram, Sikkim and Arunachal Pradesh. All these states suffer from physical disabilities such as undulating terrain due to hilly topography, limiting the availability of plain land and fertile soils, important for cultivation. This is evidently clear from state wise distribution of proportional share of NSA that physiographic factors play an important role in availability of net cropped area in a region.

Forest

The area under forest cover is about 68 million hectares or 22 per cent of the total area in the country. This area has increased from 40 million hectares in 1951 to 68 million hectaresin 2000. For the ecological balance the forest cover should be at least 33 per cent of the total geographical area of a country. The states of Arunachal Pradesh, Mizoram, Jammu & Kashmirand Tripura have relatively larger proportion of area under forest cover.

Land Not Available for Cultivation

The land under the settlements, roads, mines and quarries along with barren lands are included in this category. The sandy waste land of Rajasthan, marshy land of Kachchh (Gujarat) and rugged and eroded areas of northeast and northern mountains are few examples of barren lands. About 13 per cent of the total reported area is recorded under this category.
Nagaland, Manipur and Assam registered a very high percentage of area not available for cultivations.

Fallow Lands

When lands are left unused to regain their lost fertility in a natural way is called fallow land. On the basis of usability criteria follow lands can be divided into two groups current and old. Current fallow is the land in which no crop is raised during the current year. Old fallow land remains unused for a period of one or more years but not exceeding 5 years. This is due tolow investment capacity of numerous small and marginal farmers in advanced technology, lack of awareness, loss of fertility of soil, inadequacy of rainfall, lacking in irrigational facility etc. The fallow land occupy about 7.5 per cent of the total reported area. The states of Mizoram, Tamil Nadu, Meghalaya, Bihar, Andhra Pradesh and Rajasthan have a high percentage of area under fallow land. It is to be noted here that old fallow land may not be economically important but from ecological point of view fallow land is important category of land.

Cultivable Waste

It is the land in which crops were raised for some period of time but has not been cultivated forthe last five years due to certain deficiencies such as alkalinity and salinity in the soils. Such cultivable wastes are locally known as reh, bhur, usar, and khola in the some part of North India. Maghalaya, Himachal Pradesh and Rajasthan have a very high share of cultivable waste land in total land use in respective states.
Permanent Pastures and Grazing Lands
Notwithstanding the highest live stock population in the world, India has only less than 4 percent of the country under pastures and grazing lands. The states of Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Gujarat and Rajasthan have high above 5% of areaunder this category.

AGRICULTURAL LAND USE

The net sown area, current fallows and land under tree crops and groves are included in agricultural land use. The agricultural land in India is little more than 50 per cent of the total geographical area in the country. This is the highest share of land in any country in the world.But due to large size of population in India, per capita arable land is available only 0.17 hectares, which is lower than the world average (0.24 hec). The per

capita agricultural land insome select countries is much higher than India. In Australia it is 2.8 hec., in Canada 1.35 andin Brazil 0.33 hec.

The lower per capita availability of land is an indicator of high pressure of population on landresources. Since there is little scope for increasing land under the plough, the way out to feed the growing population can be found in increasing land productivity. Over the period, area

sown more than once has been increasing which is about 15 per cent. If the same piece of landis sown more than once in a year, it is called cropping intensity. Which stands for the ratio between gross cropped area and net sown area..The use of new technology, fertilizers, good quality of seeds and irrigation facilities are necessary for increasing intensity of cropping. The so called Green Revolution is also nothing but technological package, which include HYV seeds, chemical fertilizers and artificial irrigation. After the adaptation of Green Revolution by India in 1966 onwards agricultural, land use has undergone a significant change.

Minimum tillage

It aims at reducing tillage operations to the minimum necessity for ensuring a good seed bed.The advantages of minimum tillage over conventional tillage are,

- The cost and time for field preparation is reduced by reducing the number of field operations.
- Soil compaction is comparatively less.
- Soil structure is not destroyed.
- Water loss through runoff and erosion is minimum.
- Water storage in the plough layer is increased.

Tillage can be reduced in 2 ways

1. By omitting operations which do not give much benefit when compared to the cost.
2. By combining agricultural operations like seeding and fertilizer application.

The minimum tillage systems can be grouped into the following categories,

1. Row zone tillage

Primary tillage is done with mould board plough in the entire area of the field; secondarytillage operations like discing and harrowing are reduced and done only in row zone.

2. Plough plant tillage

After the primary tillage, a special planter is used for sowing. In one run over the field, the rowzone is pulverized and seeds are sown by the planter.

3. Wheel track tillage

Primary ploughing is done as usual. Tractor is used for sowing; the wheels of the tractor pulverize the row zone in which planting is done.
In all these systems, primary tillage is as usual. However, secondary tillage is replaced by direct sowing in which sown seed is covered in the row zone with the equipment used for sowing