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LAND CAPABILITY

KEY FOR SUSTAINABLE DEVELOPMENT

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INTRODUCTION:

In India, agriculture began by nearly 9000 BC. But the existence of agriculture goes way back into vedic texts like Rigveda, Yajurveda, etc. Land, water and air are the basic requirements for the survival of all the species available on earth. Land is a basic requirement for agriculture, it can also be called as, foundation block of agriculture as it acts as a substrate for plant growth, micro environment for microorganisms, water availability, and physical space for agricultural activities etc. provides nutrients Land is a limited resource that is being used for multiple purposes important for existence of multiple species.

Land capability is the inherent capacity of soil to support the natural growth of plants, humans and other organisms without causing any damage. Hence, land capability depicts the use of land on the criteria of purpose suitable for the land.

Land capability plays an important role in sustainable land management and implementing necessary actions required for agricultural sustainability.

Land capability classification is the system or method for grouping the types of land on the basis of their physical, environmental factors, limitations etc. to evaluate the potential of land for different purposes. The lands unsuitable for cultivation can be used for other purposes according to their land capability classification. The major goal of land capability classification is to reach complete soil conservation. Complete soil conservation can be explained as the usage of land with having perfect soil health while zero soil erosion. Land capability classification also promotes water conservation and total vegetative conservation, resulting in long term watershed management.

NEED FOR LAND CAPABILITY

According to Kamalkar, R.J(1950), **"improper selection of land for agriculture uses and lack of management measures in accordance with its capabilities greatly deteriorate the soils."**

Hence land capability classification is required for:

1. Selection of properly suitable crop for the land according to the soil capability and water availability.
2. Selection of proper conservation practices on the land as the practices unsuitable for the land group or class might be inefficient.
3. Land capability helps to use the land resources more efficiently to fulfil the requirements for fiber, food and development.
4. Changes in land cover and land use can be can be monitored and the impact on land degradation can be studied more efficiently.
5. Farmers can use the land management practices in a more efficient manner to get more yield while maintaining more sustainability by using the land capability data.

FACTORS FOR CLASSIFICATION:

The factors considered for grouping of land inti different lands in land capability classification system are:

1. Slope.
2. Soil type.
3. Erosion.
4. Soil depth.
5. Salinity
6. Moisture holding capacity
7. Wetness
8. Climatic conditions
9. Flooding
10. Topography
11. Drainage
12. Availability of nutrients
13. Soil toxicity
14. Rainfall
15. Wind velocity
16. Temperature

LAND CAPABILITY CLASSIFICATION:

According to Soil Conservation Service (SCS) of United States Department of Agriculture (USDA) On the basis of cultivability, land capability is classified into two groups:

1. Group 1 lands
2. Group 2 lands

I. Group 1 Lands.

These are generally the cultivable lands and are suitable for cultivation practices.

Group 1 lands are divided into 4 classes namely:

1. Class 1 lands
2. Class 2 lands
3. Class 3 lands
4. Class 4 lands

1. Class 1 lands:

a) Class 1 lands have only minimum to no restrictions for cultivation.

b) The slope in these lands is nearly 1%.

c) The soil in these lands is deep, fertile, well drained are easy to work on.

2. Class 2 lands:

a) Class 2 lands are the lands that have slopes nearly between 1-3%.

b) There are some restrictions for cultivation in these lands.

- These lands are moderately susceptible for water erosion or wind erosion.
- The soil depth in these lands is less than the ideal soil depth.
- The soil in these lands might be slightly saline.
- These soils might be slightly wet that can be corrected using drainage methods.

c) These lands can be easily be cultivated by using some practices like strip cropping, contour farming, terracing, bunding.

3. Class 3 lands:

a) Class 3 lands are the lands that have slopes ranging between 3-5%, and as a result have many limitations like a smaller number of suitable crops.to cultivate.

b) The restrictions in class 3 are the same as class 2 but on a larger extent.

c) The class 3 holds more restrictions as compared to class 2 due to more severe land characteristics.

d) A proper planned drainage system is required along with suitable cropping plan in case of wetlands in this class.

4. Class 4 lands:

a) The soil properties in these lands are good but the slopes in these lands range between 5-8%.

b) These lands have very high limitations and confine the crop choice while needing careful management practices.

c) These lands are mostly suitable for mostly only 2 or 3 crops that maintain the soil attributes.

d) These soils mostly contain at least one of the following features permanently:
   - High vulnerability for soil, wind or water erosion with a long history of erosion.
   - Less water holding capacity
   - Severe crop damage due to frequent overflow.
   - Excessive waterlogging, wetness and severe salinity.
   - Mostly severe climatic conditions.

Land Capability Sub-classes:

The lands in classes 1, 2, 3, 4 are further divided into subclasses depending upon further limitations:

i. e- Risk of erosion or past erosion damage.
ii. w- Wetness damage or overflow of water.
iii. s- Soil root zone limitations.
iv. c- Climatic limitations

II. Group 2 lands.

Group 2 lands are the lands that are generally not suitable for cultivation practices but can be used for other purposes.

5. Class 5 lands:

a. These lands have slopes between 8% to 12%.
b. Usually, they have no or little erosion hazard but have other limitations which restrict their usage mainly to forests, wildlife food and cover.
   e.g. bottom lands are more vulnerable to frequent overflows that hinder the normal production of the cultivated crops.

6. Class 6 lands:

a. Class 6 lands are the lands that have shallow soils and generally have steep slopes ranging upto 18%.
b. These lands have severe limitations that restrict their usage to pastures with a very limited grazing, cover, wildlife food, woodlands.

c. There are some limitations to these lands that cannot be fixed:
   i. Severe climate.
   ii. Stony texture.
   iii. Excessive wetness.
   iv. Low moisture capacity.
   v. Severe erosion.

7. Class 7 lands:

a. Class 7 lands are the lands that are generally eroded, rough, steeper slopes nearly 25%.
b. These lands generally have very shallow depth.
c. Some of these soils might be swampy, drought prone.
d. All the limitations of class 6 are applicable on this class but at a higher degree.
e. These lands can be used for forestry with some fully green cover, and using gully control methods with very less or no grazing.

8. Class 8 lands:

a. Class 8 lands are the lands that are generally the rough lands with the worst soil type available with more than 25%.
b. These lands can be used for forestry purposes only using extreme gully control methods.
c. These lands should be free from any grazing and tree cutting at all.

Certain lands in group 2 can be made cultivable with major earthmoving or other effective and costly reclamation operations. In India, both the class 7 lands and class 8 lands are combined as class 7 lands.