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Land Capability Classification

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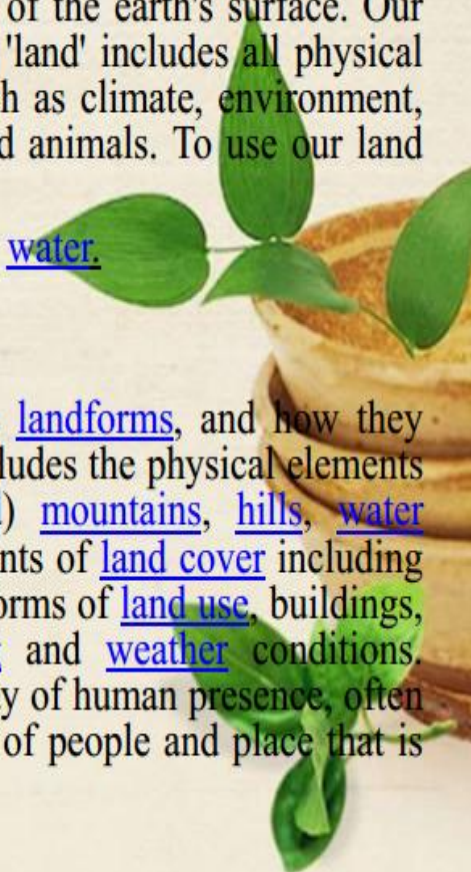


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Introduction

- Soil-Soil is porous, powdery and unconsolidated outer layer of the earth's crust which is formed by weathering of minerals and decomposition of organic substances. Soil is dynamic, three dimensional (having length, breadth and depth) piece of landscape with a three phase (solid, liquid and gaseous) system.
- Land-Land is two dimensional body. Land is the solid part of the earth's surface. Our land is home to many unique plants and animals. The term 'land' includes all physical elements in the wealth of a nation bestowed by nature; such as climate, environment, fields, forests, minerals, mountains, lakes, streams, seas, and animals. To use our land wisely we have to understand soil.
- The solid surface of Earth that is not permanently covered by water.
- Landscape-Landscape is three dimensional structure.
- A **landscape** is the visible features of an area of land, its landforms, and how they integrate with natural or man-made features. A landscape includes the physical elements of geophysically defined landforms such as (ice-capped) mountains, hills, water bodies such as rivers, lakes, ponds and the sea, living elements of land cover including indigenous vegetation, human elements including different forms of land use, buildings, and structures, and transitory elements such as lighting and weather conditions. Combining both their physical origins and the cultural overlay of human presence, often created over millennia, landscapes reflect a living synthesis of people and place that is vital to local and national identity.





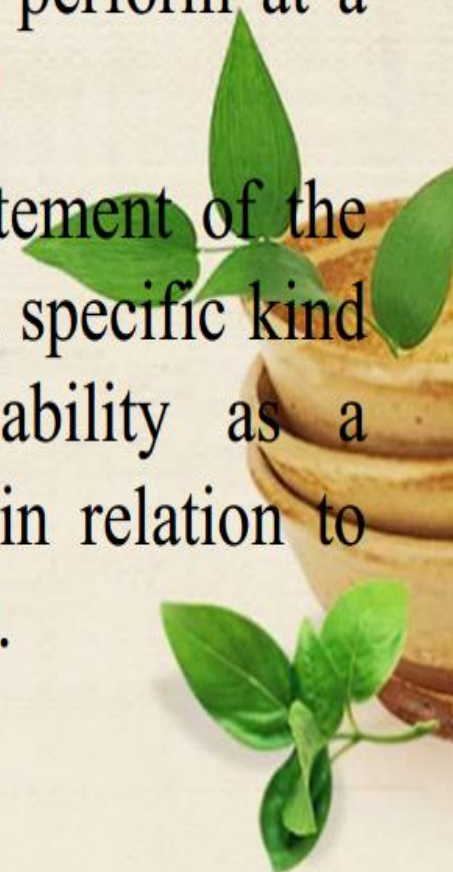
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Capability Vs Suitability

Capability:- Capability is viewed by some as the inherent capacity of land to perform at a given level for a general use. and

Suitability:- Suitability as a statement of the adaptability of a given area for a specific kind of land use; others see capability as a classification of land primarily in relation to degradation hazards (FAO, 1976).





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Land Capability Classification (LCC)

- “**Land capability classification** is an exercise for interpretative, grouping and grading of soils according to their potentialities and limitations. It helps to organize significant soil factors for conservation (Stallings J. H, 1957).”
- It also gives detailed information regarding the productivity of different types of land.



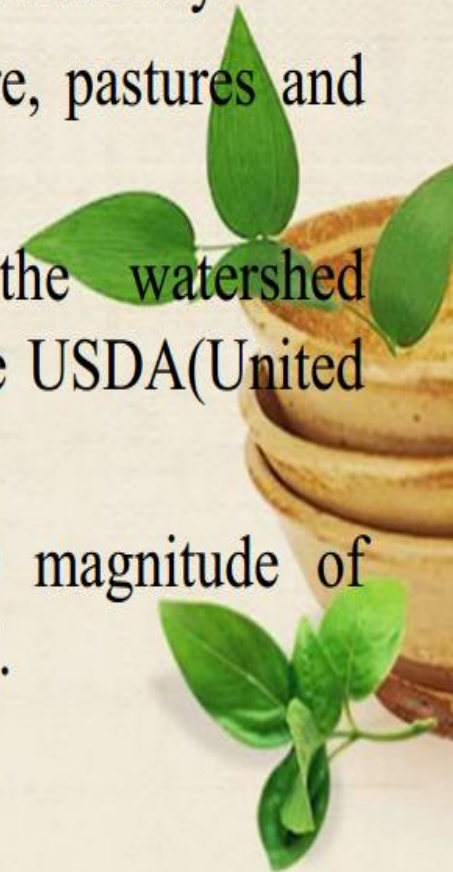


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Why do We Need Land Capability Classification?

- Land capability classification:-The first requisite to conservation of land is to fit the crop to the capabilities of the soil and the water availability.
- Lands are mainly used for agriculture, pastures and forestry.
- LCC forms the basis of all the watershed programmes. It was developed by the USDA(United State Department of Agriculture).
- LCC is based upon the degree or magnitude of problem/hazard recognized in the land.





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According to Kalmalkar, R. J. (1950)- Improper selection of lands for agriculture uses and lack of management measures in accordance with its capabilities greatly deteriorate the soils.





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When to Use Land Capability Classification?

- Identification of different groups of land suitable to different types of production and,
- Mapping of broad types of agricultural land suitability.





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Criteria of Land Capability Classification





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Criteria/ Factors Influencing Land Capability Classification

Soil profile characteristics	External feature of the land	Climate factors
<ul style="list-style-type: none">▪ Soil texture▪ Effective soil depth▪ Permeability and internal drainage▪ Availability of nutrients▪ Soil salinity▪ Soil alkalinity, and▪ Soil toxicity.	<ul style="list-style-type: none">▪ Water logging▪ Slope and erosion are the factors that determine land capability and limit the land for particular use only.	<ul style="list-style-type: none">▪ Rainfall▪ Temperature and▪ Wind velocity are important components that determine land capability class.



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LCC Classification

- a) Capability class,
- b) Capability subclass and
- c) Capability unit





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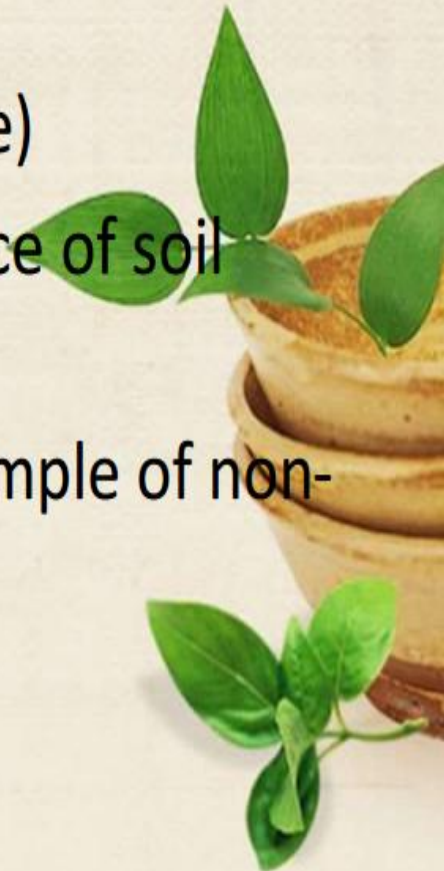
Capability Class

Broadly, It is classified into two groups:

1) Arable land classes (Cultivable)

2) Non-arable land (Non Cultivable)

- In arable land frequent disturbance of soil occur e.g. Crop field.
- Forest and plantation are the example of non-arable land.





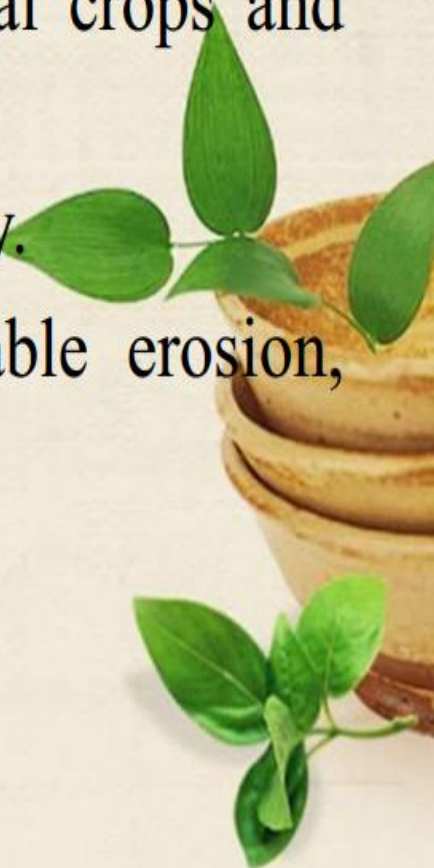
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Arable Land

Class I (Dark green)

- Best suitable for all agricultural crops and free from hazards.
- Deep soil depth and high fertility.
- Not affected by any appreciable erosion, wetness, salinity etc.





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CLASS II (Pale green)

- These lands have moderate soil depth, light or heavy texture, gentle slope and moderate soil fertility etc.
- Suitable for permanent cultivation with some soil and water conservation practices.

Class III (Yellow)

- Various conservation measures like contour bunding, graded bunding, etc. are recommended.
- These lands are suitable for plants, provided that the plant cover should be maintained.





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Class IV (Pink)

- Suitable only for occasional or limited cultivation because of unfavourable soil characteristics, slope, erosion, depth, drainage, adverse climate etc.
- Engineering measures are recommended here.





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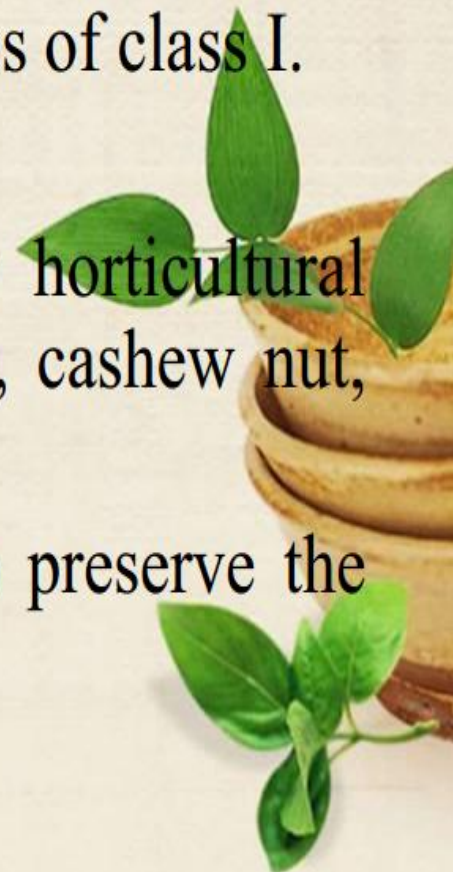
NON-ARABLE LAND

Class V (Blue)

- These lands have the potential to become class I, but due to particular problem/hazard, they can't fulfill the characteristics of class I.

Class VI (Orange)

- These lands are suitable for horticultural crops like mango, coffee, guava, cashew nut, etc.
- Grazing should be regulated to preserve the plant cover.





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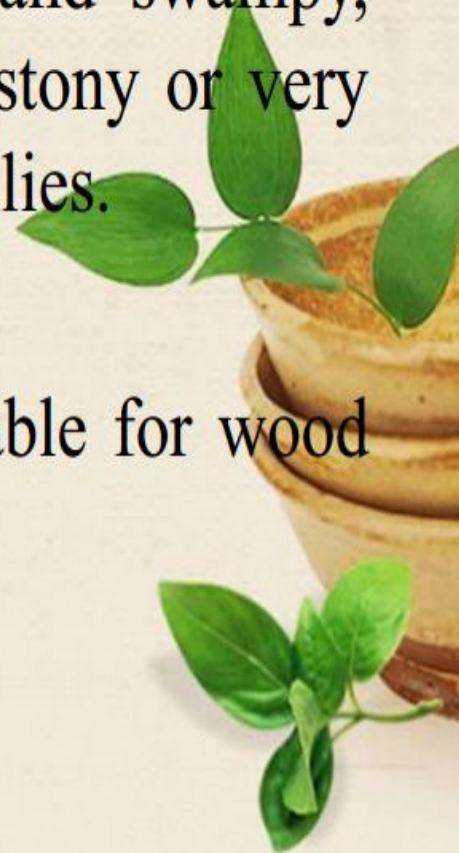
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Class VII (Red)

- These lands have severe limitations to use for grazing or forestry.
- Generally lands are droughty and swampy, having very steep slope, rough, stony or very severely eroded, infested with gullies.

Class VIII (Purple/ Violet)

- Lands are very rough, not suitable for wood land or grazing.





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LCC Sub-class

The basis of sub class is to recognize the type of problem/hazard.

The four types of hazards are:-

1. E (erosion)
2. W (water logging)
3. S (soil related hazard)
4. C (climate related hazard)



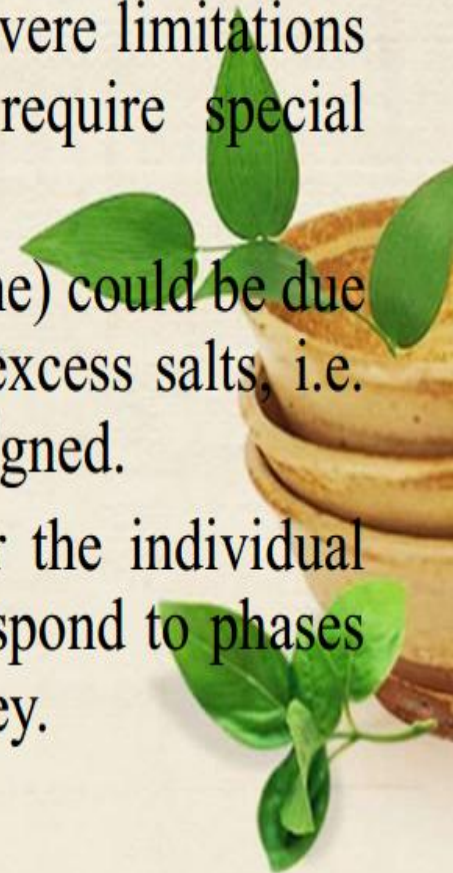


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Capability Unit

- The capability unit is a subdivision of the capability subclasses depending on the management practices. For example, class IIIs (Soils have severe limitations that reduce the choice of plants, require special conservation practices, or both;
- Soil limitations within the rooting zone) could be due to excess gravel in the root zone or excess salts, i.e. the codes IIIs1 and IIIs2 could be assigned.
- The capability units are assigned for the individual applications, but they generally correspond to phases or soil groups in the national soil survey.



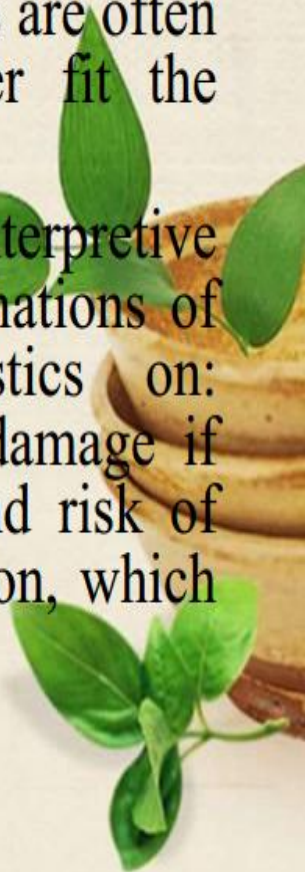


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Constraints in Applications of the Land Capability Classification

- One constraint is that it can not deal at all with special crops, e.g. like cranberries.
- Adaptations of the method to local conditions are often made in the various applications to better fit the individual needs.
- The capability classification is an interpretive classification based on the effects of combinations of climate and permanent soil characteristics on: limitations affecting land use, risk of soil damage if mismanaged, needs for soil management and risk of crop failure. This opposed to soil classification, which is based directly on the soil characteristics.

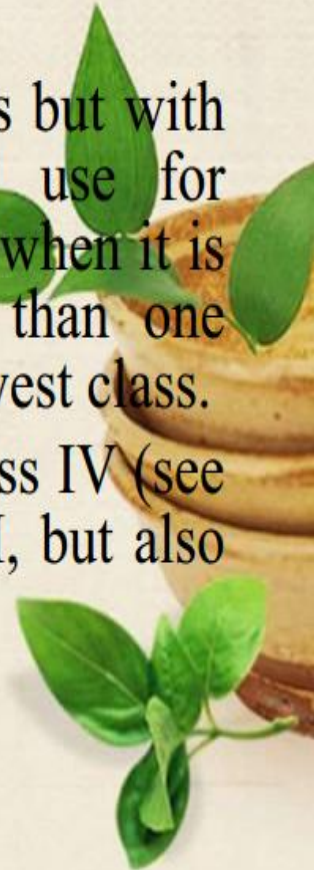




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- The criteria on the presence of water on the surface or excess water in the soil, lack of water for adequate crop production, presence of stones, presence of soluble salts or exchangeable sodium, or both, or hazard of overflow are not considered as permanent limitations to use in the classification where the removal of these limitations is feasible.
- Within a class there might be different soils but with the same degree of limitations in soil use for agricultural purposes or hazards to the soil, when it is used. If the land unit consists of more than one capability class the land unit is given the lowest class.
- There is no crop productivity rating, i.e. class IV (see below) can be more productive than class I, but also more fragile.





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- Profitability is not determined.
- A single moderately high level of management is assumed.
- Factors such as distance to market, conditions of roads and location of fields are not included.





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Conclusion

- LCC makes easier to classify different types of land into specific class based on their potentialities.
- Suitable land utilization





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