

1.2 LAND USE AND LANDSCAPE CHANGES:

Land use:

- Land is the most important natural resources making use of land for various purposes like cultivation, forestry, grass land, other than agriculture etc, is called as land use.
- It also has been defined as "the total of arrangements, activities, and inputs that people undertake in a certain land cover type".
- Land use involves the management and modification of natural environment or wilderness into built environment such as settlements and semi-natural habitats such as pastures, and managed woods.
- Land management is the process of managing the use and development (in both urban and rural) of land resources.
- Land resources are used for a variety of purposes which may include organic agriculture, reforestation, water resource management.
- Land management can have positive or negative effects on the terrestrial ecosystems.
- Land being misused can degrade and reduce productivity and disrupt natural equilibriums.
- Land use and land management practices have a major impact on natural resources including water, soil, nutrients, plants and animals.
- Land use information can be used to develop solutions for natural resource management issues such as salinity and water quality.
- Land use change such as deforestation and desertification, together with use of fossil fuels, are the major anthropogenic sources of carbon dioxide; agriculture itself is the major contributor to increasing methane and nitrous oxide concentrations in earth's atmosphere.
- Land-use change can be a factor in CO₂ (carbon dioxide) atmospheric concentration, and is thus a contributor to global climate change.

Types of Land use:

There are many types of land use,

- (i) Recreational
- (ii) Transport
- (iii) Agricultural
- (iv) Residential
- (v) Commercial

(i) Recreational:

Land is used for human pleasure. It includes parks, museum, sports ground etc.

(ii) Transport:

It is used for roads, railways, subways, airports etc.

(iii) Agricultural:

It is created by man specifically to grow or raise biological products or food products for consumption.

(iv) Residential:

It is used in which housing predominates includes single family housing, multi-family residential.

(v) Commercial:

Land is used for commercial purposes and intended to generate a profit. It includes hotels, malls, office building.

Factors affecting Utilization of land:

Some of the factors include,

- Landforms
- Climate
- Population
- Demand for agricultural products
- Profession
- Attitude of people
- Land ownership
- Soil condition

- Technology
- Irrigation facility
- Human Capability

Land use zones:

Zoning is the process of dividing land in a municipality into zones in which certain land uses are permitted or prohibited.

The various land use zones includes:

1. Residential zones
2. Commercial zones
3. Industrial zones
4. Urban services zones
5. Agricultural and reserve zones
6. Direct control provision

1. Residential zones:

(i) Single detached residential zone:

This zone provides the opportunity for single-family housing.

(ii) Low density infill zone:

This zone provides the opportunity for retaining single-family housing, while allowing some duplex development.

(iii) Small scale infill development zone:

This zone provides the opportunity for single-family and duplex housing while allowing some apartment or row housing with up to four units.

(iv) Residential small lot zone:

This zone provides the opportunity for single-family housing with attached garages on smaller lots.

(v) Planned lot residential zone:

This zone provides the opportunity for single-family housing on smaller lots and accessed by a rear lane.

(vi) Semi-detached zone:

This zone provides the opportunity for primarily semi detached and duplex housing.

(vii) Row housing zone:

This zone provides the opportunity for relatively low to medium density housing such as row houses or town houses

(viii) Medium density multiple family zone:

This zone provides the opportunity for medium density housing such as row houses or town houses that may have separate second storey units.

(ix) Low rise apartment zone:

This zone provides the opportunity for low-rise apartment buildings up to four storey's.

(x) Medium rise apartment zone:

This zone provides the opportunity for medium rise apartment buildings up to 6 storey's in height.

(xi) High rise apartment zone:

This zone provides the opportunity for high rise apartment buildings.

(xii) Rural residential zone:

This zone provides the opportunity for permanent single-family residential development in a rural setting.

2. Commercial zones:**(i) Shopping centre zone:**

This zone provides the opportunity for larger shopping centre has intended to serve a community or regional area. Entertainment and cultural uses may be included in this zone.

(ii) Low intensity business zone:

This zone provides the opportunity for low intensity commercial, office and service uses located along arterial roadways that border residential areas.

(iii) General business zone:

This zone provides the opportunity for businesses that requires large sites and location with good visibility and accessibility along or adjacent to major public road ways.

(iv) Highway corridor zone:

This zone provides the opportunity for high quality commercial development along roads serving as entrance roots to the city.

3. Industrial zone:**(i) Industrial business zone:**

This zone provides the opportunity for industrial businesses that carry out their operations such that no nuisance is created or apparent outside an enclosed building and the use is compatible with any adjacent non-industrial zones.

(ii) Light industrial zone:

This zone provides the opportunity for high quality, light industrial developments and limited accessory outdoor activities any Nuisance factor associated with these uses will not extend outside an enclosed building.

(iii) Medium industrial zone:

This zone provides the opportunity for manufacturing, processing, assembling, distribution, service and repair uses that carryout part of their operation outdoors or requires outdoor storage areas. Any nuisance associated with the users should not extend beyond these sites.

(iv) Heavy industrial zone:

This zone provides the opportunity for industrial uses that due to their appearance, noise, odour, risks of toxic emissions are incompatible with residential, commercial and other land uses.

4. Urban Services Zones**(i) Urban Service Zone:**

This zone provides the opportunity for publicly and privately owned facilities which provide institutional or community services.

(ii) Public Utility Zone:

This zone provides the opportunity for a system or utilities that are used to benefit the public, such as water, sewage disposal, electric power, heating, waste management, drainage, public transportation and telecommunications.

(iii) Municipal Airport Zone:

This zone provides the opportunity for the operations of the Edmonton City Centre Airport.

(iv) Public Parks Zone:

This zone provides the opportunity for an area of public land for recreational uses.

(v) Natural Areas Protection Zone:

This zone provides the opportunity for the conservation, preservation and restoration of identified natural areas, features and ecological processes.

(vi) Metropolitan Recreational Zone:

This zone provides the opportunity for preserving natural areas and parkland along the river, creeks, ravines and other designated areas for recreational uses and environmental protection conforming approved plans.

(vii) River Valley Activity Node Zone:

This zone provides the opportunity for limited commercial development for recreation and tourism uses within designated areas of parkland along the river, creeks and ravines.

(viii) Alternative Jurisdiction Zone:

This zone provides the opportunity for lands that do not require a Development Permit because they are under the jurisdiction of federal or provincial legislation or the Constitution Act. These lands are not required to conform to the Zoning By law.

5. Agricultural and Reserve Zones**(i) Agricultural Zone**

This zone provides the opportunity for conserving agricultural and rural land use activities.

(ii) Urban Reserve Zone

This zone provides the opportunity for agricultural and rural land use activities and a limited range of other uses that will not impact future development of the land.

(iii) Industrial Reserve Zone

This zone provides the opportunity for agricultural and rural land use activities that will not impact future use of the land for industrial development.

6. Direct Control Provisions**(i) Direct Development Control Provision:**

This zone provides the opportunity for detailed, sensitive control of the use, development, and design of buildings and disturbance of land. This zone is used to establish, preserve or enhance areas of unique character or environmental concern, or areas of special interest as designated under the Historical Resources Act.

(ii) Site Specific Development Control Provision

This zone provides the opportunity for direct control over a specific proposed development where the proposed mix of uses or the development regulations cannot be accommodated in a standard zone.

Advantages of Land Use Pattern in India:

- It helps to divide the land in order to use it for different purposes.
- Plateaus are filled with minerals, forest and fossil fuels and thus make it productive for the country.
- Plains are most fertile part of land and helps in cultivation of crops by farmers.

Disadvantages of Land Use Pattern in India:

- Human activities like deforestation, overgrazing etc. degrade the quality of land in India.
- Forest area is very less as compared to the geographical area of the country.

Landscape changes:

- 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.
- The character of a landscape helps define the self-image of the people who inhabit it and a sense of place that differentiates one region from other regions.
- It is the dynamic backdrop to people's lives. Landscape can be as varied as farmland, a landscape park or wilderness.
- The Earth has a vast range of landscapes, including the icy landscapes of polar regions, mountainous landscapes, vast arid desert landscapes, islands, and coastal landscapes, densely forested or wooded landscapes including past boreal forests and tropical rainforests, and agricultural landscapes of temperate and tropical regions.
- The activity of modifying the visible features of an area of land is referred to as landscaping.
- Landscape refers either to all the visible features of an area of land (usually rural), often considered in terms of aesthetic appeal, or to a pictorial representation of an area of countryside, specifically within the genre of landscape painting.
- When people deliberately improve the aesthetic appearance of a piece of land by changing contours and vegetation, etc.
- It is said to have been landscaped, though the result may not constitute a landscape according to some definitions.
- Modification of the landscape by humans for agricultural and other purposes has led to the immense loss of native vegetation, fragmentation and degradation of habitat, factors implicated in the global decline of biodiversity .
- Many landscapes throughout the world are now highly modified with only scattered fragments of native vegetation remaining.

- The modification of landscapes influences ecosystem processes, species richness and distribution, as well as altering physical attributes of the environment, ultimately leading to a poorer environment in which all species, including humans, live.
- Maintaining the integrity of ecosystems is vital if they are to adapt to climate change, if biodiversity is to flourish, and if humans are to continue to receive the ecological goods and services on which we depend for our existence.
- Services provided by functional ecosystems include clean air and water, carbon sequestration, pollination, biological pest control, raw resources, the prevention of soil erosion and degradation, and recreational opportunities.

Several words associated with landscape:

There are several words that are frequently associated with the word landscape,

1. Scenery:

The natural features of a landscape considered in terms of their appearance, when picturesque: spectacular views of mountain scenery.

2. Setting:

In works of narrative (especially fictional), it includes the historical moment in time and geographic location in which a story takes place, and helps initiate the main backdrop and mood for a story.

3. Picturesque:

The word literally means "in the manner of a picture; fit to be made into a picture", picturesque as "a term expressive of that peculiar kind of beauty, which is agreeable in a picture".

4. A view:

"A sight or prospect of some landscape or extended scene; an extent or area covered by the eye from one point".

5. Wilderness:

An uncultivated, uninhabited, and inhospitable region.

6. Cityscape (also townscape):

The urban equivalent of a landscape. In the visual arts a cityscape (urban landscape) is an artistic representation, such as a painting, drawing, print or photograph, of the physical aspects of a city or urban area.

7. Seascape:

A photograph, painting, or other work of art which depicts the sea, in other words an example of marine art.

Types of landscape:

1. Natural landscape is made up of a collection of landforms, such as mountains, hills, plains, and plateaus. Lakes, streams, soils (such as sand or clay), and natural vegetation are other features of natural landscapes.

2. Cultural landscape, as defined by the World Heritage Committee, is the "cultural properties that represent the combined works of nature and of man".

(i) "A landscape designed and created intentionally by man"

(ii) An "organically evolved landscape" which may be a "relict (or fossil) landscape" or a "continuing landscape"

(iii) An "associative cultural landscape" which may be valued because of the "religious, artistic or cultural associations of the natural element."

Major stages of landscape:

landscape change represented by four major stages of landscape condition .

Landscapes can be:

1. **Intact** – in which landscapes contain most original vegetation with limited clearing;
2. **Variegated** – in which landscapes are dominated by original vegetation, but include gradients and buffers of modified habitat;
3. **Fragmented** – contains discrete patches of vegetation in a modified matrix.
4. **Relictual** – with little (less than 10%) of the original vegetation remaining, surrounded by highly modified landscape.

Effects of landscape change on species and populations:

- Different organisms display diverse and individual responses to landscape modification depending on the scale at which they normally operate and the scale at which they perceive the environment.
- The ability to utilize highly modified landscapes (e.g. agricultural pastures), in addition to native habitat, has enabled some generalist species, like galahs, to prosper and expand their ranges.
- Some species are known as 'edge specialists'; they inhabit the matrix vegetation boundary and benefit from highly fragmented landscapes.
- Generally, the number of species found within an area is proportional to the size of the area and how isolated it is from other core areas.
- This concept is known as the species-area relationship and is derived from the equilibrium theory of island biogeography.
- The theory postulates a relationship between the number of species found on an island and the island's area and isolation.
- The theory predicts that the number of species on an island represents a dynamic balance between the rate of colonization of new species to the island and the rate of extinction of species already present.
- Within unmodified landscapes, a given species may occur as spatially discrete populations that are functionally connected via the interchange of dispersing individuals.
- Collectively, such connected populations are known as a 'meta-population'.
- The presence of a species within a patch does not necessarily equate to a locally viable population.
- Species may persist within vegetation patches because of immigration of individuals from resource-rich areas outside the patch or locality.
- These populations are considered 'sink' populations as they are unable to sustain their numbers in the absence of immigration.