CBCS PG: Elective Paper-Environmental Science

M. Sc., Semester-II, Paper-II

Natural Resources and their Management

Topic: Desertification & degraded land and their management

Desertification

It is a type of land degradation in which a relatively dry area of land becomes increasingly arid, typically losing its bodies of water as well as vegetation and wildlife.

Degraded land

Degraded land is land that has lost some degree of its natural productivity due to human-caused processes.

Cause of desertification

- **Climate change (particularly the current global warming)**
- **Over exploitation of soil through human activity**

Effect of Desertification

It affects topsoil, groundwater reserves, surface runoff, human, animal and plant populations.


TRIBUNE
ONLINE

Indicators of desertification

Physical indicators

- Decrease in soil organic matter
- Decrease in soil fertility
- Soil crust formation/compaction
- Appearance/increase in frequency/severity of dust sandstorms/dune formation and movement
- Salinization/alkalinization
- Decline in quality and quantity of ground and surface water

Biological indicators

- **Vegetation**
- Decrease in cover
- Decrease in above-ground biomass
- Decrease in yield
- Alteration of key species distribution and frequency
- Failure of species successfully to reproduce
- **Animal**
- Alteration in key species distribution and frequency
- Change in population of domestic animals
- Decline in livestock production
- Decline in livestock yield

Social indicators

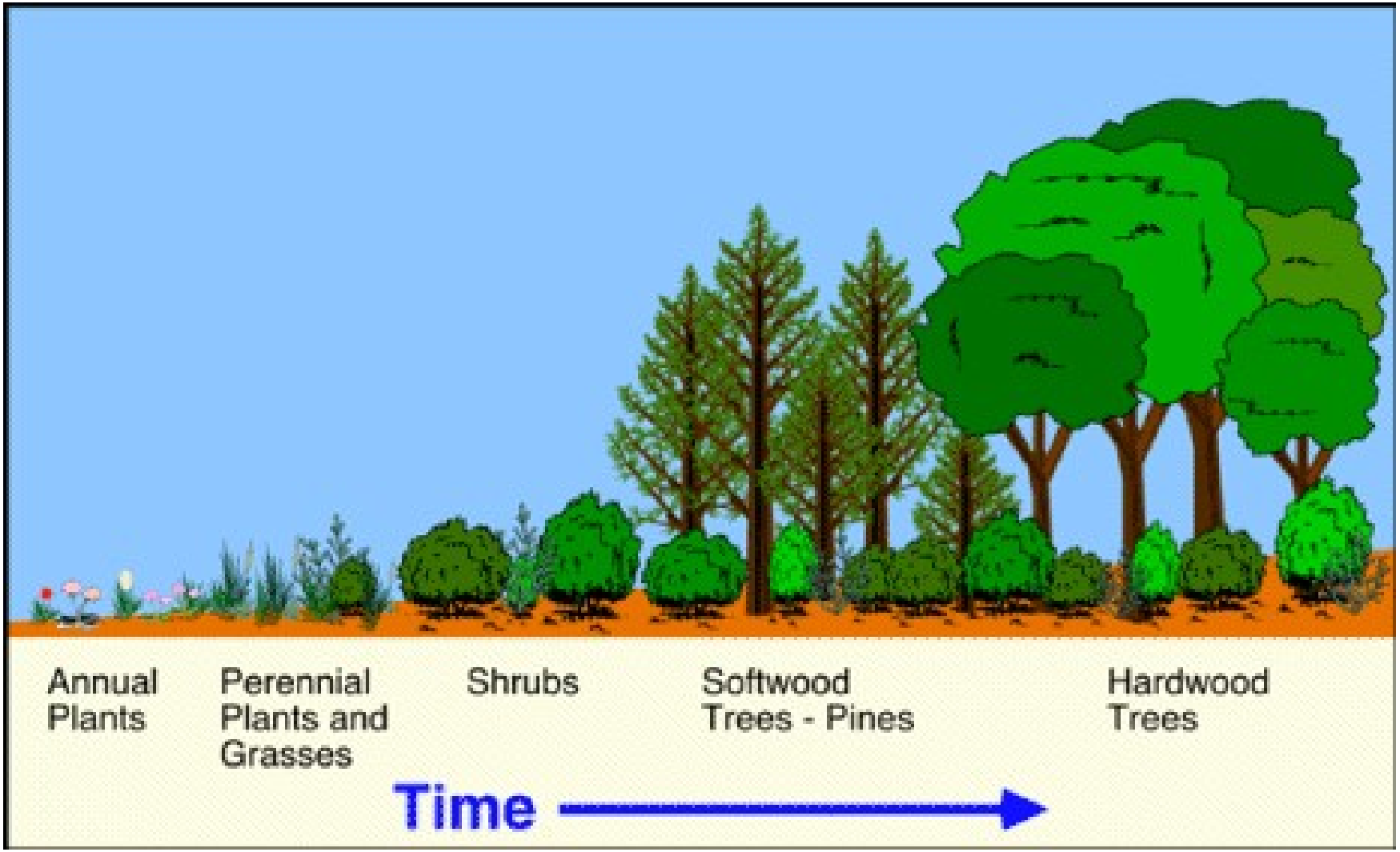
- Change in land use/water use
- Change in settlement pattern (e.g. abandonment of villages)
- Change in population (biological) parameters (demographic evidence, migration statistics, public health information)

Management of desertification/land use planning

- Integrating land and water management to protect soils from erosion, salinization, and other forms of degradation.
- Protecting the vegetative cover, which can be a major instrument for soil conservation against wind erosion.
- Integrating the use of land for grazing and farming where conditions are favorable, allowing for a more efficient cycling of nutrients within the agricultural systems.
- Giving local communities the capacity to prevent desertification and to manage dry land resources effectively.
- Turning to alternative livelihoods that do not depend on traditional land uses, such as dry land aquaculture, greenhouse agriculture and tourism-related activities, is less demanding on local land and natural resources, and yet provides sustainable income.

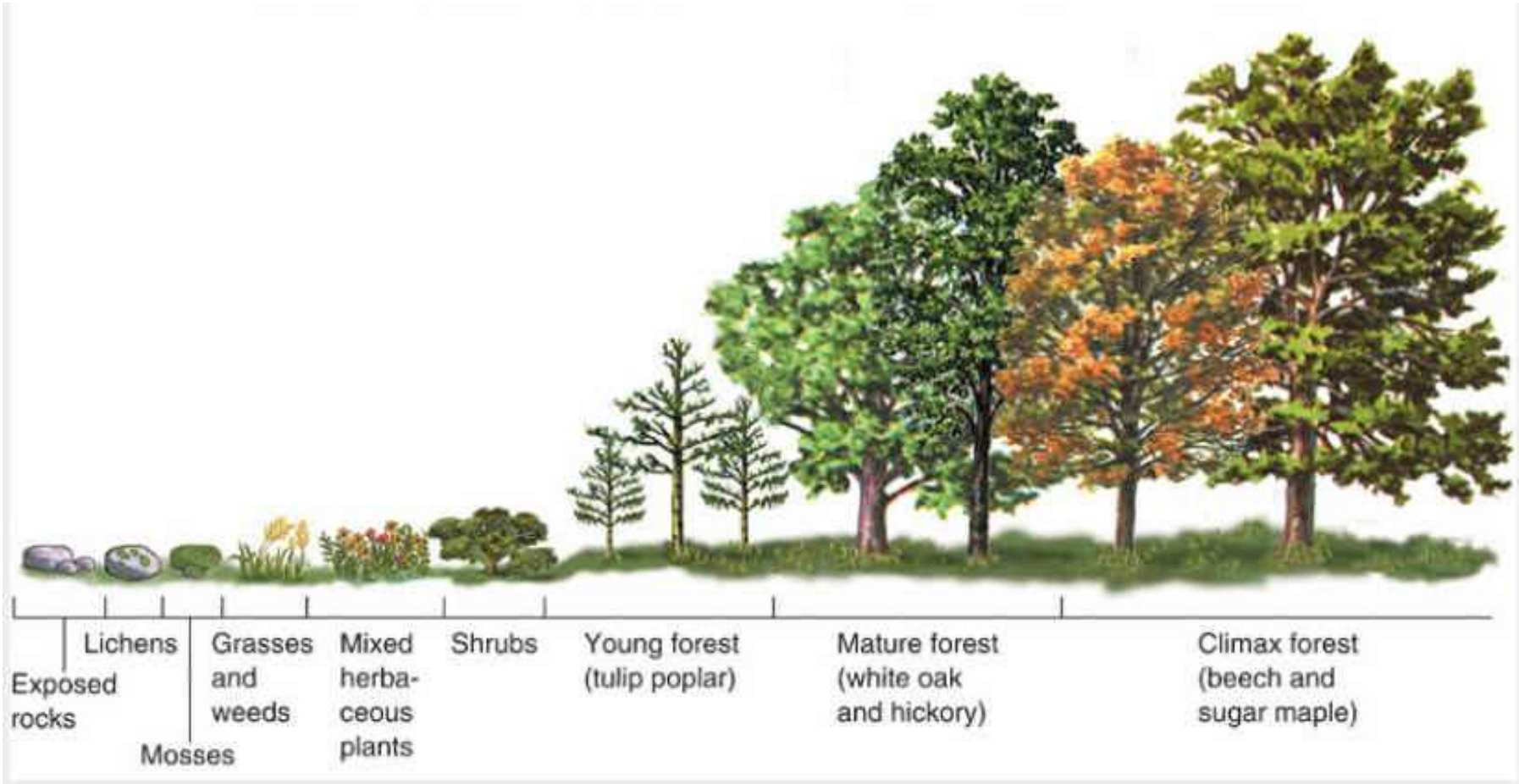
General Process of succession

Ecological succession is the process of change in the species structure of an ecological community over time.


Annual Plants
Perennial Plants and Grasses
Shrubs
Softwood Trees - Pines
Hardwood Trees
Time

Climax

Ecological succession is the process of community replacement unless a community is established which is in equilibrium to local conditions. Therefore climax vegetation is the reflection of the ultimate stage of succession where community don't go any further change.


Exposed rocks
Lichens
Mosses
Grasses and weeds
Mixed herba-ceous plants
Shrubs
Young forest (tulip poplar)
Mature forest (white oak and hickory)
Climax forest (beech and sugar maple)