

- Course title :- Biodiversity Cons. And Mgt
- Courses code :- FRST 1042
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- Instructors :- Sintayehu T.

chapter one : basic concepts of biodiversity

1. Introduction

2. Classification of values of Biodiversity

3. Major values of biodiversity

4. Levels of organizations in biodiversity

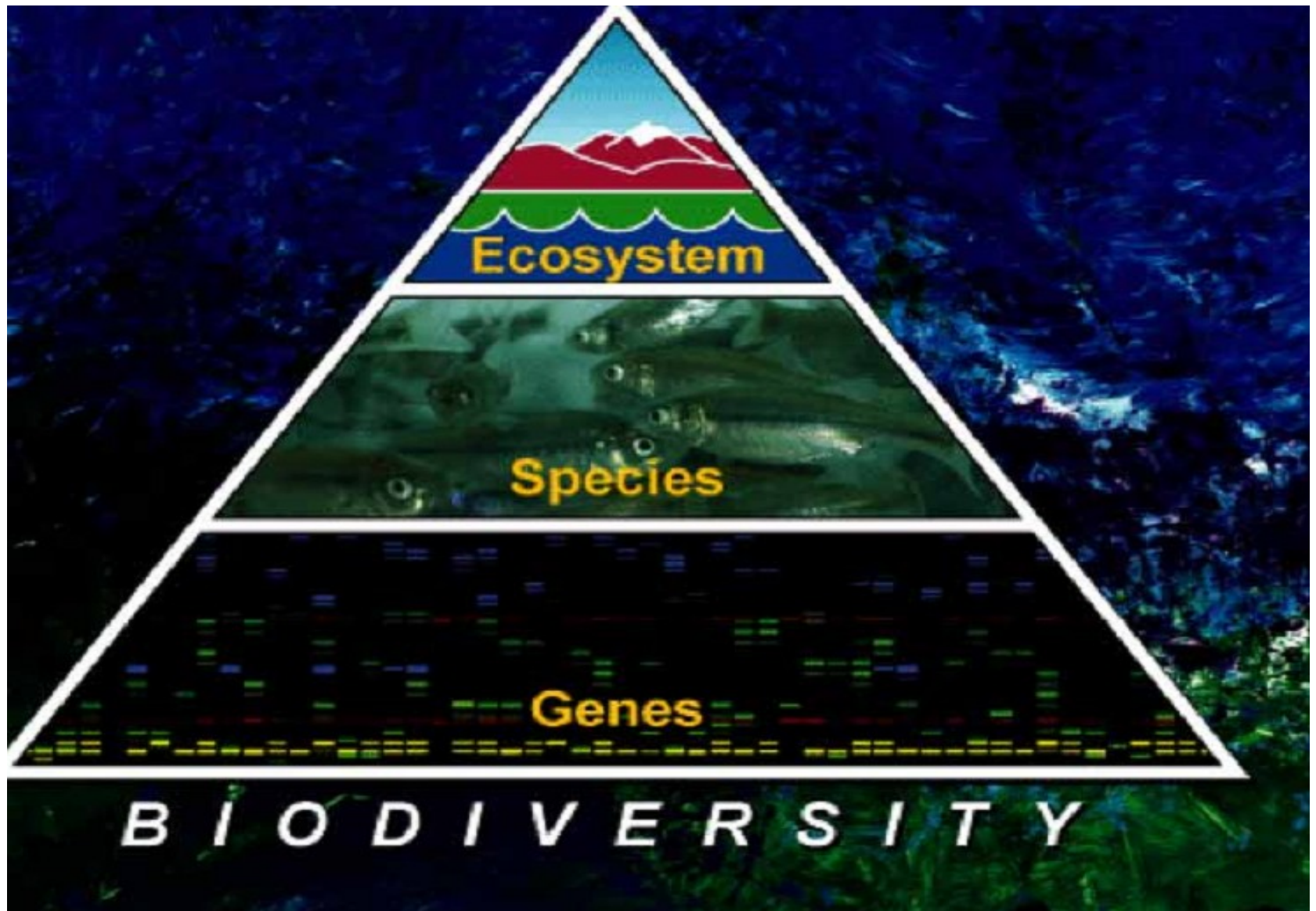
1. Introduction

- ❖ The term `biological diversity', often shortened to `biodiversity'- variability of living organisms in a given assemblage.
- ❖ Biodiversity therefore holds the whole of `Life on Earth'
- ❖ Biodiversity or biological diversity refers to the variation of microbes, plants and animals within a given area, including the ecosystem and human culture

- Refers to the numbers, variety and variability of living organisms and ecosystem
- Includes all terrestrial, marine and other aquatic organisms
- Covers diversity within species, between species as well as variations among ecosystems

Levels of biodiversity organizations

- Genetic diversity - Diversity of genes within a species. i.e. genetic variability among the populations and the individuals of the same species.
- Species diversity- Diversity among species in an ecosystem. “Biodiversity hotspots” are excellent examples of species diversity.
- Ecosystem diversity- Diversity at a higher level of organization, the **ecosystem**. To do with the variety of ecosystems on Earth.



Importance of biodiversity

Direct values

1. The direct value:- include food resources like grains, vegetables, fruits which are obtained from plant resources and meat, fish, egg, milk and milk products from animal resources
- Also include other values like medicine, fuel, timber, fiber, wool, wax, resin, rubber, silk and decorative items

Indirect values

- Biodiversity also provides indirect benefits to human beings which support the existence of biological life and other benefits which are ***difficult to quantify***

- These include social and cultural values, aesthetic values and

Major values of biodiversity

1. Scientific Value
2. Ecological Value
3. Economic Value
4. Social Value
5. Aesthetic Value
6. Ethical Value etc.

1. Scientific Value

- As the raw material for biological study, biodiversity is essential for the scientific endeavor to continue unhindered
- Scientific value is indicated the potential of a species to contribute to

- So biologists claim that biodiversity must be preserved as raw material for scientific foundations
- This could include sites of long standing research value (sources of knowledge)
- genetic storehouse for biotechnology and a place to retreat to when we need to get

- The ecological value of biodiversity can be found by examining each ecosystem and identifying the ecosystem services
 - Soils formation and protection
 - Nutrient storage and recycling
 - Pollution breakdown and absorption,
 - Contribution to climate stability
 - Maintenance of ecosystems

Example: in wetlands the vegetation captures water-carried sediment and the soil organisms break down a range of nutrients and pollutants washed into the area These processes provide the ecosystem service of purifying water

- Wetlands also act as spawning and nursery grounds for some fish and provide a refuge for animals in times of drought

- Some of these benefits come in the form of goods that can be directly valued and coasted because they provide something that can be extracted and sold
- These goods include everything from all the domesticated agricultural crops that form the basis of the world's food supply, to

- ***Example:-*** The most fundamental value of biological resources particularly plants is providing food. About 7,000 species of plants and several hundred species of animals have been used for human food
- ***Business and industry***; Many industrial materials derive directly from biological sources. These include building materials, fibers, dyes, rubber, oil
- ***Human health***:- risks of climate change are associated with changes in biodiversity
- ***Drug discovery*** and the availability of medicinal resources

4. Social Value

- Social Values in which human beings attach to sites and species, as a part of feeling, culture, history or religion
- This is especially true of rural and forest based communities
- social importance of complex native ecosystems as well

5. Aesthetic Value

- Natural landscapes at undisturbed places are a delight to watch and also provide opportunities for recreational activities like photography
- It promotes eco-tourism which further generates revenue by designing of zoos, botanical gardens, national parks, wild life conservation etc.

7. Ethical Value

- These values are related to conservation of biodiversity where ethical issue of 'all life forms must be preserved' is laid down
- There is an existence value which is attached to each species because biodiversity is valuable for the survival of human race
- Moreover all species have a moral right to exist independent of our need for them

Biodiversity and sustainable development

Conservation

- Means sustainable use and protection of natural resources
- including plants, animals, mineral deposits, soils, clean water, clean air, and fossil fuels such as coal, petroleum, and natural gas
- Natural resources are grouped into two categories, **renewable and nonrenewable**
- A **renewable resource** is one that may be **replaced over time by natural processes**, such as fish populations or natural vegetation, or is inexhaustible, such as solar energy

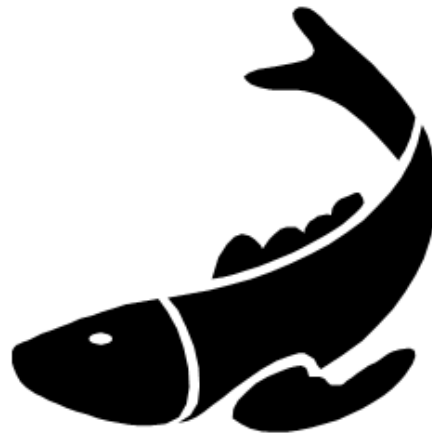
- The goal of renewable resource conservation is to ensure that such resources are not consumed faster than they are replaced
- *Nonrenewable resources* are those in limited supply that cannot be replaced or can be replaced only over extremely long periods of time
- Extinction for animals and plants
- **Nonrenewable resources** include fossil fuels and mineral deposits, such as iron ore and gold ore.
- Conservation activities for **nonrenewable resources** focus on maintaining an adequate supply of these resources well into the future

- Natural resources are conserved for their biological, economic, and recreational values, as well as their natural beauty and importance to local cultures
- For example, tropical rain forests are protected for their important role in both global ecology and the economic livelihood of the local culture

- For the sustainable utilizations of our natural resources we should search for the alternative consumption methods
- Eg. Sunlight, electricity, biogas, keep the purity of water body, creating awareness among the society, avoid overexploitation, avoid deforestation,



BIODIVERSITY and **SUSTAINABILITY**





Sustainability

- The ability to maintain ecological processes over long periods of time.
- Sustainability of an ecosystem is the ability of that ecosystem to maintain its structure and function over time in the face of external stress.

Sustainability

- Is strongly linked to ecosystem health.
- The more sustainable an ecosystem is, the healthier it is because it is able to “deal” with external stress better (i.e. limiting factors).



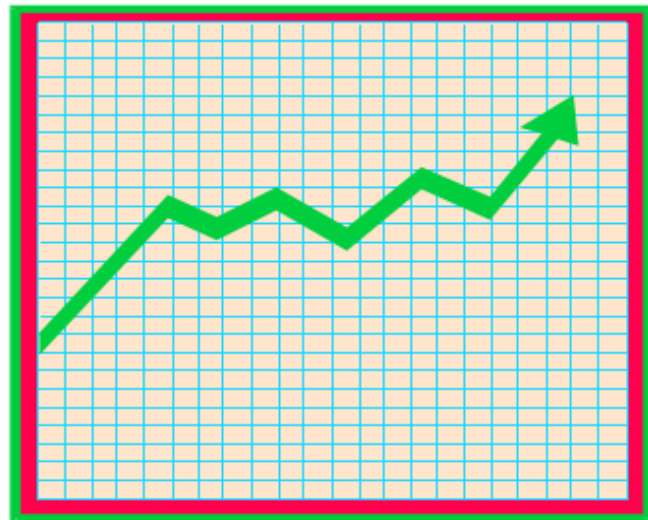
Biodiversity and Sustainability

- The biodiversity of an ecosystem contributes to the sustainability of that ecosystem.
- Higher/more biodiversity = more sustainable.
- Lower/less biodiversity = less sustainable.
- High biodiversity in an ecosystem means that there is a great variety of genes and species in that ecosystem.



Biodiversity and Sustainability

- A great variety of genes and species means that the ecosystem is better able to carry out natural processes in the face of external stress.
- Thus, the ecosystem is more sustainable.



Biodiversity and Sustainability

- The more sustainable an ecosystem is, the better it is for the environment and for people.
- People use ecosystems as sources of food, medicine and economy.
- Thus, it is in everyone's best interest to increase the sustainability of ecosystems.
- How can we do this?

