



BIODIVERSITY

Dr. Vijay K. Khorwal

CHE 110: Environmental Studies

Unit - 3

Biodiversity

U3_L1_CHE110_VK



Vijaykant Khorwal
Ph.D. Chemistry
(IIT Bombay, Mumbai)

What is Biodiversity

- The term biodiversity is made up of two words – bio and diversity.
- Variability among living organisms from all sources (including terrestrial, marine and other ecosystems)
- Convention on Biological Diversity (1992) in Rio Earth Summit
- India ranks 10th among the plant rich countries of the world, 11th in terms of number of endemic species of higher vertebrates and 6th among the centers of diversity and origin of agricultural crops.

Levels of Biodiversity

- Genetic diversity
 - Variations among the genes of the same species are known as genetic diversity.
 - It is this type of diversity that gives rise to the different varieties of rice, mangoes, dogs etc.



Levels of Biodiversity

- **Species Diversity**
 - Diversity which arises due to variations among species present in specific areas is called as 'species diversity'.
 - Horses and donkeys are distinct species, as are lions and tigers.



Levels of Biodiversity

- Ecosystem Diversity
 - Ecosystem diversity is the diversity of habitats which include the different life forms within.
 - The term also refers to the variety of ecosystems found within a biogeographical political boundary.



Values of biodiversity

- **Productive Value**

- Different products are obtained from different organisms, like silk from silk-worm, wool from sheep, fur of many animals, lac from lac insects etc.

- **Ecological Services**

- It refers to the services provided by ecosystems like prevention of soil erosion, prevention of floods, maintenance of soil fertility, cycling of nutrients, fixation of nitrogen, cycling of water, their role as carbon sinks, pollutant absorption and reduction of the threat of global warming etc.
- Biodiversity have enormous potential and a decline in biodiversity will lead to huge economic, ecological and socio-cultural losses.

Values of biodiversity

- **Survival**

- Food: A large number of wild plants are consumed by human beings as food.
- Fuel: The fossil fuels coal, petroleum and natural gas are also products of fossilized biodiversity.

- **Health and Healing**

- About 75% of the world population depends upon different plants or plant extracts for medicines.

Values of biodiversity

- Ethical and Aesthetic Value

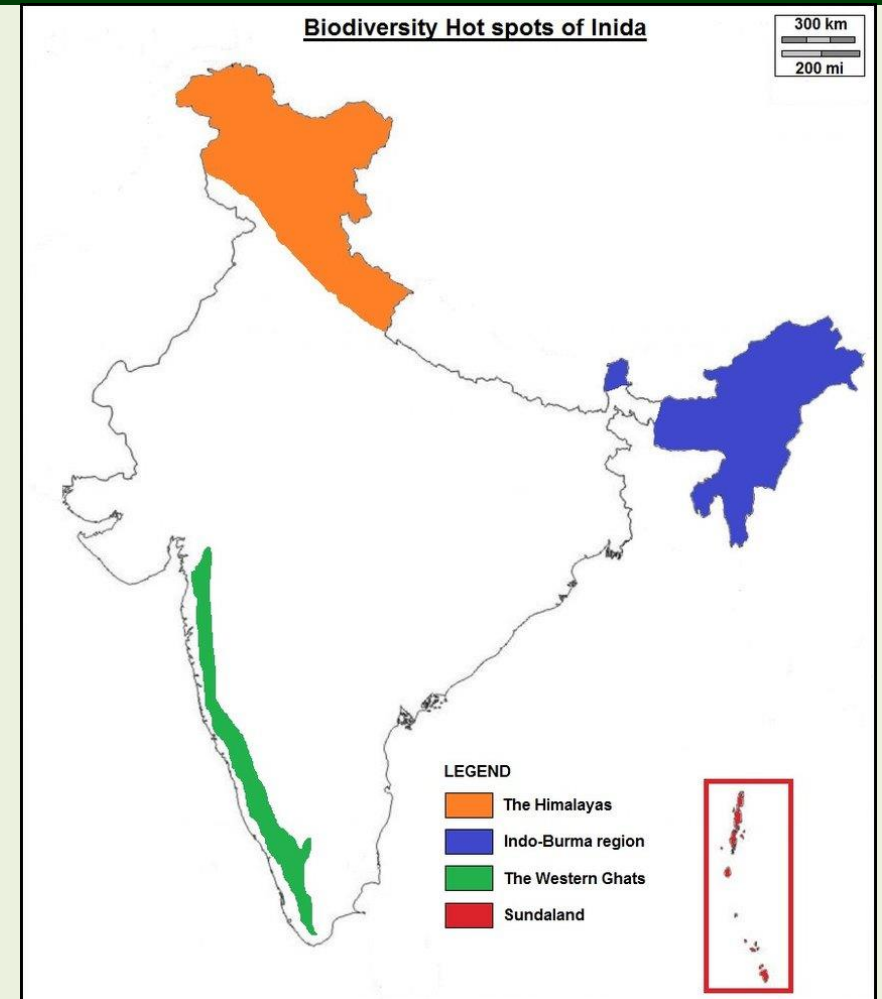
- Many of the plants are considered holy and sacred in our country like Tulsi, Peepal etc.
- The ethical value means that we may or may not use a species but knowing the very fact that this species exists in nature gives us pleasure.
- People from far and wide spend a lot of time and money to visit wilderness areas where they can enjoy the aesthetic value of biodiversity and this type of tourism is now known as eco-tourism.

Hot spots of Biodiversity

- A biodiversity hotspot is a biogeographic region with a significant reservoir of biodiversity that is under threat from humans
- These have been identified based on three criteria:
 - The number of species present.
 - Endemism (The number of those species found exclusively in an ecosystem).
 - The degree of threat they face.

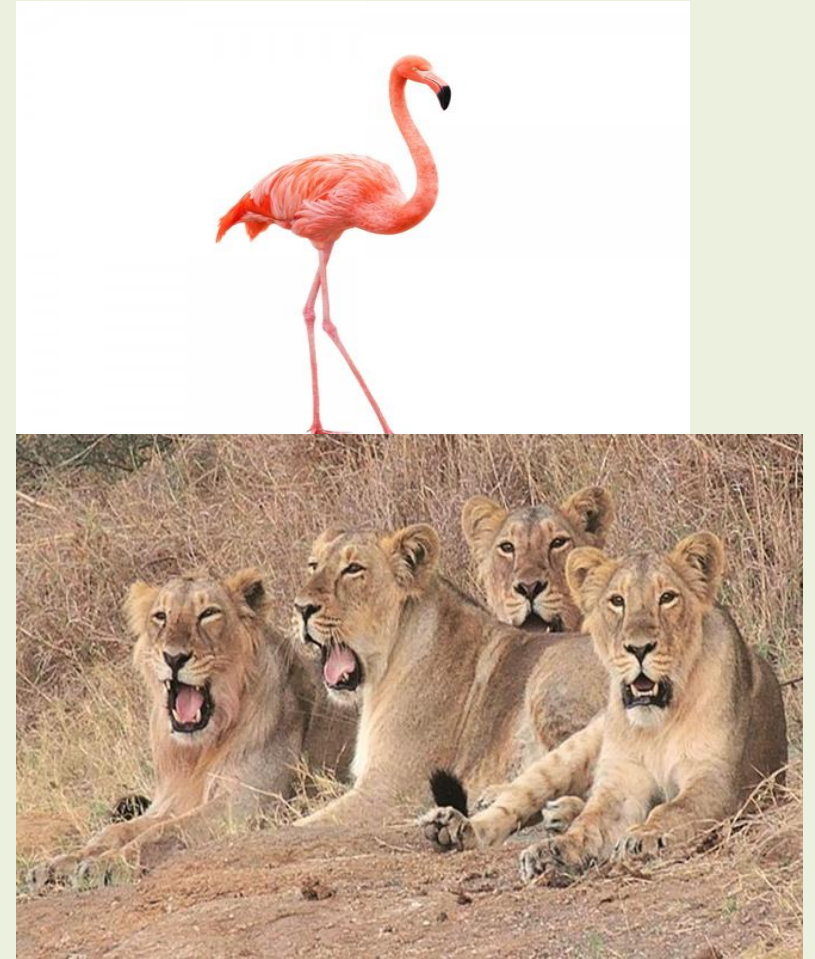
Hot spots of Biodiversity

- Hot Spots of India
 - The Western Ghats
 - The Eastern Himalayas
 - Indo-Burma
 - Sundaland
 - Nicobar island



Endangered species

- Plant or animal species which are at the verge of their extinction are called endangered species.
- Flying squirrel,
- Gir lion,
- Crocodile,
- Flamingo,
- Wild ass,
- Desert cat, desert fox, Asiatic elephant etc. are some endangered animal species of India.



Vulnerable species and Rare species

➤ Vulnerable species

- A vulnerable species is one which has been categorized by the International Union for Conservation of Nature
- As likely to become endangered unless the circumstances that are threatening its survival and reproduction improve.
- Sarus crane, Great Indian bustard, Common leopard, House sparrow etc.



➤ Rare Species

- A rare species is a group of organisms that are very uncommon, scarce, or infrequently encountered.

Endangered black buck

- The black buck is also known as kala hiran in India.
- Earlier, it was found all over India except in the north-eastern regions of the country.
- Due to large scale-poaching and destruction of habitat, its existence now restricted in some parts of Punjab, Gujarat, Rajasthan, Uttaranchal and Haryana.
- The black buck does not require dense forests, even it is usually found in open plains in herds. So, open plains need to be conserved in order to enable the black buck to move freely.
- Recently, the film actor Salman khan was sentenced to 5 yrs imprisonment for shooting black bucks.



Endemic Species

- The plant or animal species confined to a particular region and having originated there or a species which occur continuously in that area are known as endemic species. Restriction of species or taxa in small region is known as endemism.
- True Cardamom (*Elettaria repens*), Peepal (*Ficus religiosa*), Palash tree (*Butea monosperma*), Bargat (*Ficus bengalensis*), etc. are some of the endemic plants.
- One-horned rhino (*Rhinoceros unicornis*), Tahr (*Nilgiritragus hylocrius*), Snow leopard (*Panthera uncia*), Royal Bengal tiger (*Panthera tigris tigris*), Gir lion (*Panthera leo persica*) etc. are some of the endemic animals of India.



This PPT should be used as reference only. Reading books (mentioned in syllabus) is mandatory for the preparation of the examinations.

EDGE species

- Evolutionarily Distinct and Globally Endangered (EDGE) species represent a disproportionate amount of unique evolutionary history. They have few close relatives, are often the only surviving member of their genus, and sometimes the last surviving genus of their evolutionary family.
- Some EDGE species, such as elephants and pandas, are well known.

