Chapter-15

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Biodiversity and Conservation

Biodiversity term was given by Edward-Wilson.

Biodiversity is totality of gene or species or ecosystem of habitate.

* Genetic diversity :-

Diversity and genetic level is called genetic diversity.

Ex:- A single species may have much more genetic diversity like in india 50,000 genetically different strain of rice is found.

one thousand mango variety are found.

* Level of Diversity :-

Rice > Wheat > mango.

* Species diversity :-

→ Diversity and species level is called species-diversity.

Ex :- Westernghat has much more species diversity than eastern ghat.

* Ecological diversity :-

→ Diversity and ecosystem level is called ecosystem diversity. / Ecological diversity.

* Diversity and Community level :-

(1) α - Diversity → Diversity within community.

(2) β - Diversity → Diversity between the community.

(3) γ - Diversity → Diversity of species in a habitate of entire land scape or geographical reason.

* Biodiversity day – 22 may.

* Biodiversity year – 2010

* On our planet different biodiversity are found like :-

(i) 20 thousand species of Ant.
(ii) 3 lakhs species of bettels.
(iii) 28 thousand species of fishes.
(iv) 20 thousand species of orchid.

Q. How many species are their on earth & How many in india?

Ans This estimation analisis is controled by an independent international institution that is called IUCN (2004).

* IUCN → international union for conservation of nature and natural resources. (Switzerland)

→ According to this total number of plant and animal species discribed so far is more than 15 lakh (1.5 million).

→ But don't have clear idea how many yet to be discovered and discribed in future.

→ In all over the World 70% species are animals.

→ While 22% species are plant including Algae, fungi, Bryophyta, Pteridophyta, Gymnosperm & Angiosperm.

→ Among animals, insects are the most species reach and these are about more than 70%. that is on every 10 animals on this planet, 7 are insect.

* → The number of fungi species in this world is more than combined total of the species of fish, amphibian, reptile & mammalian.

(Species no.) fungi > Fish + Amphibian + Reptile + Mammalian.

*Estimations of Biodiversity:-

(I) invertebrates :-
(i) insects (ii) other animals group (iii) ~~Mollusca~~ mollusca
(iv) Crustaceans.

(II) vertebrates :-
(i) fish (ii) birds (iii) reptiles (iv) Amphibian
(v) mammalians.

(III) Plants :-
(i) fungi (ii) Angiosperm (iii) Algae (iv) Mosses
(v) ferns & allies (vi) lichen.

→ India has only 2.4% of worlds lands area.

→ India share 8.1% global species diversity i.e why india is the one of the 12 mega diversity countr of the World.

* Some of the endemic species in india are :-

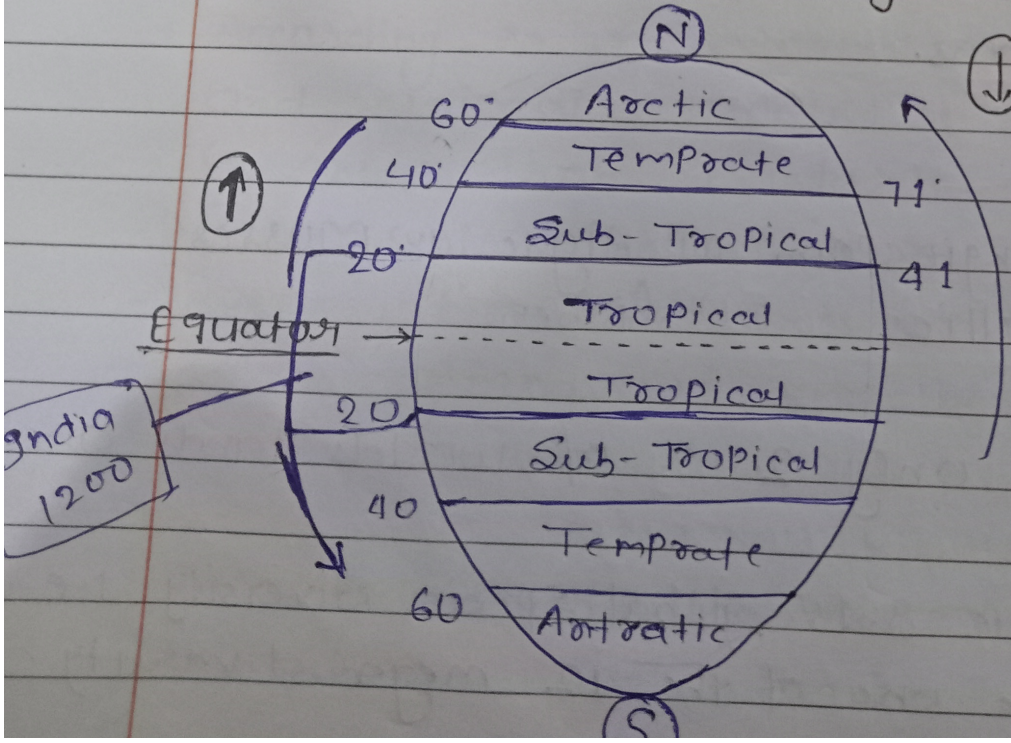
(i) vertebrate (60%.)
(ii) Amphibian (53%.)
(iii) fresh Water fish (36%.)
(iv) Reptiles (10%.)
(v) Mammalian (10%.)

→ while 90,000 animal species have been discovered from india.

→ A/c to estimations more than 1 lakh plant species and more than 3 lakh animal species yet to be discovered and discribed.

*→ A/c to may's global estimation only 22% of the total species have been recorded So far.

* Pattern of Biodiversity:-



* Pattern of Biodiversity analysed by two way:-
(i) Latitudinal gradient.
(ii) Species area relationship.

(i) Latitudinal gradient:-
→ In general species diversity decreases when be move from equator to pole.

→ Like Columbia located near the equator has 1400 species of born while newyork having 105 species of born & greenland only having 56 species of born are found.

→ India has it's much more reason in the tropical reason due to which more biodiversity occur and more than 1200 species of born species are found.

*→ The largely tropical amazon rain forest in South America has the greatest biodiversity on the earth.

→ Amazon rain forest is the home for.
14000 (14k) Species of plant.
3000 (3k) Species of fishes (pisces)
1300 (1.3k) Species of birds
427 ~~of~~ ~~mam~~ species of mammalians.
427 Species of Amphibian.
378 species of Reptiles and
more than 1 lakh 25 thousand in vertibrates are present.

→ A/c to estimation 2 million or 20 lakhs insect species not yet discovered and discribe.

Q. Why is tropical zones are most biologically diversified ?

(i) In tropical reasons, tropical latitudes have remain relatively on disturbed or stable for millions of year due to this they occur or represent along evolutionary time for species diversification.

(ii) In tropical invironment has more Seasons compare to temperate and this Seasons are constant and predictable.

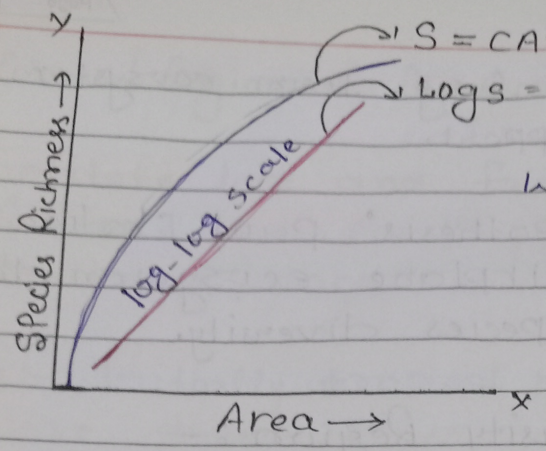
(iii) Their is more Solar energy available in the tropical reason due to which higher productivity occur and it terms into greater diversity.

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(iii) Species - Area relationships :-

→ Species - Area relationship Graph is represented by Alexander von Humboldt.

→ A/c to him with in a region Species richness increases ~~within~~ with increasing explored area, but only up to a limit.



$S = CA^Z$

$\log S = \log C + Z \log A$

Where,

S = Species richness

A = Area

Z = slope of the line or, regression coefficient.

C = Y-Intercept

→ Z-value for small area 0.1 to 0.2.

→ for large region or continents 0.6 to 1.2.

→ Z-value for frugivorous (fruit-eating) birds and mammals in the tropical rain forests. (1.15).

* Species diversity to the Ecosystem region :-

(i) Ecologist beleave that communities with more species generally are more stable. Compair to those with less species.

(ii) A stable community should not show too much variation in productivity from year to year.

(iii) Community must be either resistant or resilient to occasional disturbances.

(iv) Communities must be resistant to invasions by alien species.

(v) David Tilman's long-term ecosystem environment support.

(vi) 'Rivet popper hypothesis' paul Ehrlich represent the airplane ecosystem that also support species diversity.

* Loss of Biodiversity Region :-

→ The character of species which are susceptible for extinctions are.

(i) Large body size.
(ii) Small population size.
(iii) Low reproductive Rate.
(iv) Narrow and localised range of distribution.
(v) Fixed migration root.
(vi) feeding at high tropical level in food chain.

* Type of extinction :-

(I) Natural extinction :- Due to sudden change in environmental condition.

(II) Mass extinction :- Due to mishap or Catastrophe.

(III) Anthropogenic or manmade :- Due to humen activities like hunting and global warming.

* Cause / Region of Biodiversity loss :-

(i) habitate loss and fragmentation :-
→ Animal and plants get extended from particular area.

Ex :- Initially tropical rain forest once covered more than 14 per cent of earth land surface. which how a days only 6 Percent area covered by tropical rain forest.

(ii) over-exploitation :-
Many species extended in last 500 years

Ex :- Steller's cow, passenger pigeon.

(iii) Alien species invasions :-
When a new species are introduced to a particular geographical region is called exotic or, alien species.

(iv) Co-extinctions :-
When a species become extended of plant and animal species associated with it in an obligatory or, symbiotic relation also become extended.

* Region for conservation of Biodiversity :-
There are many reasons for conservation of ~~Some~~ biodiversity in which Some are obvious and Some are not so obvious, but all are equally important.

* These are group into three categories :-
(i) Narrowly utilitarian
(ii) Broadly utilitarian
(iii) Ethical

(i) Narrowly utilitarian :-
It conserving biodiversity are obvious.

(ii) Broadly utilitarian :-
Those which are provided by nature.

(iii) Ethical :- It means what we are conserving from our coming generation.

* How to conserved Biodiversity ?
(i) In Situ Conservation.
(ii) Ex- Situ conservation./on- site conservation

(i) In Situ conservation :- When we conserved and protect the whole ecosystem it's biodiversity at all level is protected.

like we save the intire forest to save the tiger. This approach is called In Situ conservation.

(ii) Ex- Situ conservation :-
In Ex- Situ conservation threatened animals and plants are taken out from their natural habitat and placed in special Setting where they be protected and given special care.

Ex:- Zoological parks, botanical gardens and Wildlife safari.

In Ex-Situ conservation many animals that have become ~~extended~~ extinted but continued to pigmented in zoological parks.

* Endemism:- The particular species that not found any where else except one region.

NOTE:- Sacred groves:- These are the last refuges for a large number of rare and Threatened plants.

Sacred groves are found in khasi and Jaintia Hills in meghalaya, Aravalli Hills of Rajasthan, Western Ghat region of karnataka, and Maharashtra and the Sarguja. Chanda and Bastar areas of Madhya pradesh.

In World total 25 hotspots was present. NOW a days it is 34.

* In india and their surrounding territory 4 hotspots are found:-

(i) Western Ghats
(ii) Sri Lanka
(iii) Indo - Burma
(iv) Himalaya.

→ All the biodiversity of World together covers approximate 2 percent of land area.

→ In india 14 biosphere reserves, 90 national Parks and 448 Wildlife Sanctuaries are present.

→ The first earth ~~Submit~~ Summit was held in Rio de. janeiro in 1992.