DIRECTION IAS

UPSC Q A

Set - 2

GEOGRAPHY

ANSWER

Question and Answer format with word limit
How to write answers
How to maintain word limit

Prepared By

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DIRECTION

Write Short notes, within 150 words each, on the following ; 10x5=50

Que.1.(a) What is coalition of Rainforest Nations?

The term rainforest is applied to denote two types of biomes- tropical and temperate. The tropical rainforest are found closer to the equator, thus relates to warm and wet conditions. In comparision temperate rain forests are in more colder coastal areas It is tropical rain forest that is known for dense vegetation canopy that forms three different layers. This layer of vegetation prevents much of sunlight from reaching the ground. It is also home to big diversity of heterotrophs. Beyond these conventional characteristics, the rainforest are-

i) natural climate solution
ii) covers less than 3% of area but ½ of terrestrial annual species
iii) supplies of fresh water
iv) provider of life saving medicinal plants
v) providing livelihood support to 1out of 4 people worldwide

However, due to unsustainable practices, there has been tremendous pressure generated on these forests. It has been therefore the under UN's REDD+ coalition of rainforest nations was formed in 2005. It assists tropical governments, community and people resonsibly to manage their rain forest in decentralised manner. The coalition covers about 90% of world's remaining rainforest.

The members of the coalition have agreed in compliance to REDD+ to work to attain -

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DIRECTION

Policy and tools that endeavor to achieve sustainability for forested and agricultural land and is process -

- support climate stability, biodiversity conservation, poverty alleviation
- innovating financial tools in partnership of governments and communities
- enable sustainable livelihood that improves living standards for forest dependant communities
- set a precent and enable similar outcome for other tropically forested countries.

Que. 1(b) **Examine important set of TEK strategies.** *10marks*

The Traditional Ecological knowledge provides three different types of benefits - Economic, Ecological and Ethical. In order to attain these benefits practically, TEK orients towards three inter related set of strategies -

i) Additional pathways for sustainable agriculture

This strategy includes two set of defined path ways - incremental and contour. The first pathway is to build step by step upon the TEK available with the society, so as to avoid drastic changes in land use system that can cause social disruptions for reasons that can be ecological / cultural. This path way is particularly important in dealing with traditional dwellers.

The contour pathway in comparision follows ecological contours of landscape to create

DIRECTION

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Que. 1(c) **What are the challenges of extirpation?** *10marks*

The term extirpation is applied to denote local extinction, i.e. the condition of a species that ceases to exist in a given habitat, though it still exists elsewhere. Declining biodiversity is a consequence of the accumulation of local extinction events that can eventually extinguish the last remaining populations of species. Although widespread extirpation is known to occur, the causes of these events may be difficult to discern. In general, these are largely attributed to variety of broad human induced mechanism - mediated by population growth and impact.

Specifically, local loss of species is seen as a consequence of reduction of habitable area and environmental deterioration; as well as transformation and fragmentation of natural habitats. Inspite of importance of understanding causes of extirpation, the evidences supporting cause-effect relationships varies greatly in strength.

The IUCNs Red list, one of the most valuable data source on lost biodiversity and its cause is largely based on estimation and projections. Similarly CITES also aims at importers contention that species is not declined/ threatened underscores difficulty in the attainment of consistent evidence of sources of threats to the species.

DIRECTION

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DIRECTION

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extirpation thus can be made discern as only a specific case. The freshwater mussel has high rate of extinction, has multiple concurrent causes This complicates determining the ultimate reason of decline. The 3 most defined causes water quality depletion, habitat destruction and hydrologic change, are such correlated that specifying one becomes challenging. Hydrologic change can degrade both water quality and habitat.

Major environmental events as volcanic eruptions may also lead to extirpation causing added complexity to the causes.

Que. 1(d) **Discuss biological realms of sea.** *10marks*

Biological realms are large spatial regions within which ecosystem shares a broadly similar biological evolutionary history. These realms are categorised into terrestrial and aquatic realms.

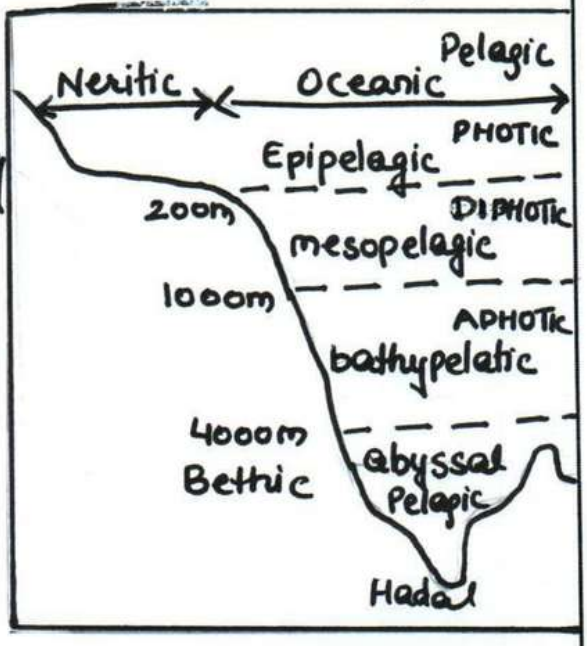
The aquatic realm of sea is majorly divided into benthic and pelagic based upon the ecological characteristics and marine life associated with it.

The benthic realm - It refers to the floor of the oceans, extending from the high tide line to the greatest depths of oceans. The organisms that live in/on bottom are called benthos. The benthic realm is subdivided on the basis depth. The benthic life forms are both sessile (attached) and motile (mobile). These

play important role in food chain. Benthic plants thrives only in euphotic zone, though animals can thrive below. They depends mostly on the rain of organic debris from photic zone.

Hydrothermal Vents makes local and special habitat in benthic zone. These are crack along the ocean bottom that spews out heated water (temperature ranging between 300 - 350°C), which are rich in dissolved minerals. The billowing clouds of sulfides provides habitat for giant tube worms, yellow mussels, clams, pink sea urchins. These are Chemotrophs.

The Pelagic realm. This realm is compressed of almost all water. It is horizontally divided into the neritic or fertile near shore province and Oceanic province. Vertically it is divided into photic and aphotic zones. It is in the photic zone that phytoplanktons thrives moreover zooplanktons and necktons also thrives here. In the aphotic zone necktons (fish, squid) becomes dominant as lack of sunlight restricts the growth/existence of planktonic life



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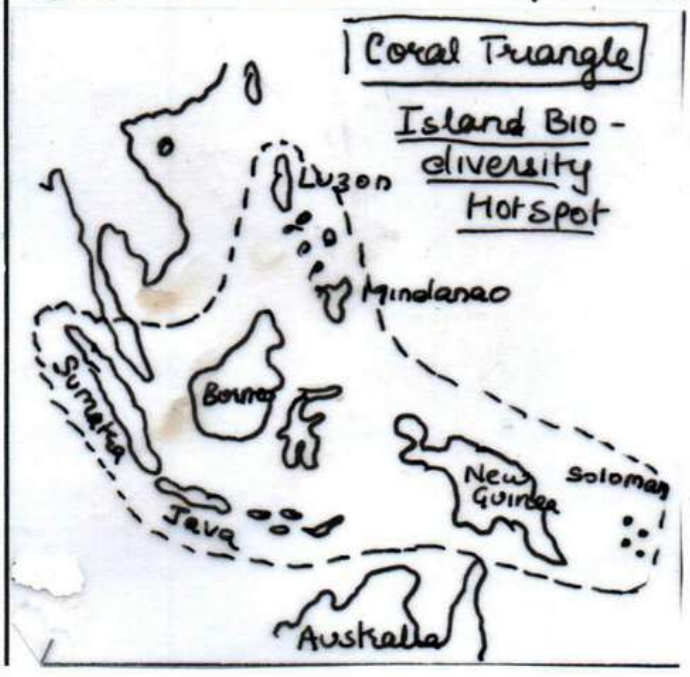
Que. 1(e) **What are the challenges faced by Island Biodiversity.**

Islands and their surrounding near shore marine areas constitute unique ecosystems, often comprising many plants and animals species that are endemic. This is primarily due to unique evolutionary history. They are also key to livelihood economy, well being and cultural identity of about 600 million people i.e 1/10th of world's population.

Island species are also unique in their vulnerability, which is reflecting in the increasing pressure on island economies. All the Small Island Developing States (SIDS) depends thus on conservation of island biodiversity.

The challenges faced by island biodiversity can be categorised into Natural & Human

Naturally, the fragile, vulnerable and unique characteristics is added by - small number of species, species with diminished dispersal capacity, evolution in the environment where fewer species led to lesser competition. They thus have developed survival strategies based on interdependencies, co-evolution and mutualism rather than defense mechanism against range of predator and competitors.



As a result island species have became more rare and threatened..
Human induced challenges are in bigger interrelated range that can include invasive alien species, tourism development climate change and variability, natural disaster, over exploitation and unsustainable use along with pollution and waste disposal.
These human induced challenges, over the past century have multiplied challenges thus vulnerability of island biodiversity

Que. 2. (a) **Briefly describe the Laws of Limiting factors in ecology.** *20marks*

A limiting factor is a resource or environmental condition which limits the growth, distribution or abundance of an organism or population within an ecosystem. These can be either physical or biological factors which can be identified through a response of increased or decreased growth, abundance or distribution of a population, when the factor is changed.
The limiting factors are theorized under-
i) Liebig's Law of minimum
ii) Blackman's law of limiting factors
iii) Shelford's law of tolerance.

According to the law of minimum, the growth is regulated by the limited factors i.e. resources in scarcity and not by the resources in abundance.

DIRECTION

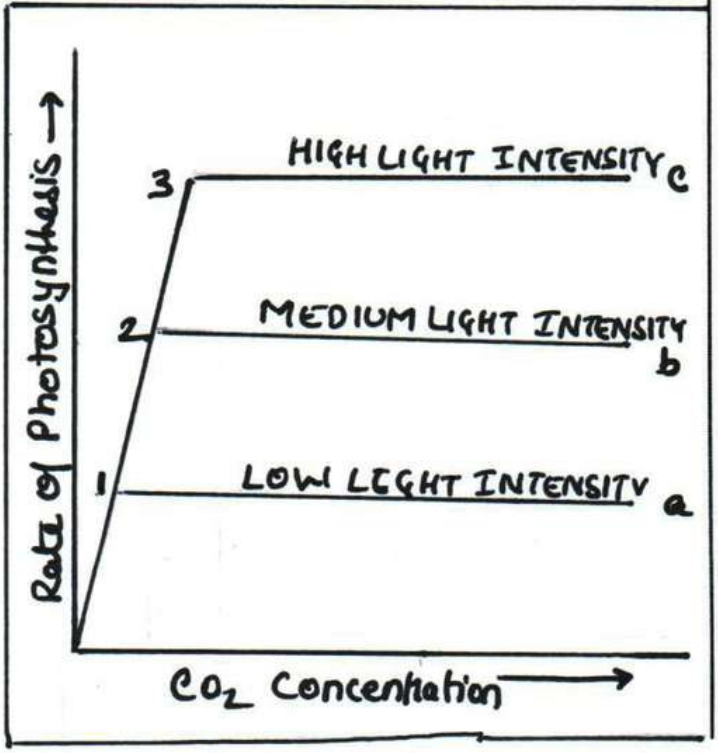
The studies conducted revealed that by providing the nutrients present in scarcity plant growth is facilitated. It thus emphasises that availability of nutrient in scarcity is the limiting factor which is equally important for plant growth as the nutrient in abundance.

The scientific applications of this law are extended to ecosystem models or population The organism or plant growth depends on many factors. At any given time these factors are available in different levels and one among all are present in minimum levels thus limiting than others

The Law of limiting factor was based on plant's photosynthesis system. A number of factors tends to regulate the biological processes but factors in different amount affect the process on the whole.

Photosynthesis requires basic components like water, sunlight etc. Any of these factors present in scarcity will affect the rate of photo-synthesis.

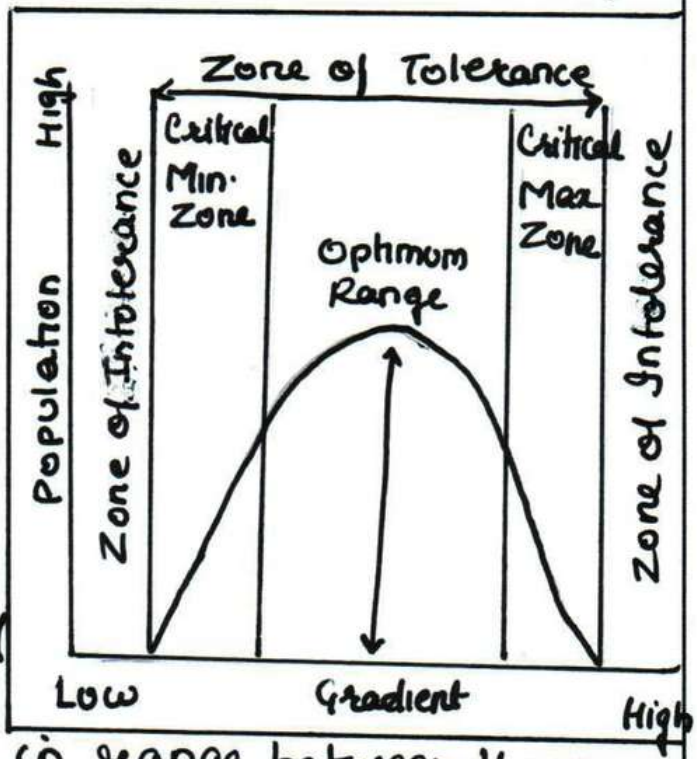
As shown in figure



DIRECTION

at first concentration of CO_2 increases, there is increase in rate of photosynthesis, but after a limit, this effect ceases (1-a) The intensity of light now becomes limiting factor. Its increase, increases rate of photosynthesis, to eventually become constant (2-b) The rate reaches its heghest limits (3-c) to again become constant.

Law of tolerance - states that its not only the factor present in limits but also excess of the same factor can affect the growth or rate of biological process. Thus every factor has its own maximum and minimum limits in every organism and the Zone of tolerance is in range between these two limits



Based on this, the environmental factors have two zones - Zone of intolerance and Zone of tolerance. Further the Zone of tolerance has Optimum zone, Critical minimum zone, Critical maximum zone. In optimum zone thus most favourable conditions prevails for growth and development of organisms