General Knowledge Today

Environment-7: Short Questions for Prelims

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What is Ecosystem Approach?

The Ecosystem Approach places human needs at the centre of biodiversity management. It aims to manage the ecosystem, based on the multiple functions that ecosystems perform and the multiple uses that are made of these functions. The ecosystem approach does not aim for short-term economic gains, but aims to optimize the use of an ecosystem without damaging it.

What is Ecophene?

The range of phenotypic modifications produced by one genotype within the limits of the habitat under which the genotype is found in nature.

What are Various stages of Ecological Succession?

The ecological succession refers to more or less predictable and orderly changes in the composition or structure of an ecological community. Its various stages are:

- Nudation: Succession begins with the development of a bare site, called Nudation (disturbance).
- Migration: It refers to arrival of propagules.
- Ecesis: It involves establishment and initial growth of vegetation.
- Competition: As vegetation becomes well established, grow, and spread, various species begin to compete for space, light and
- Reaction: During this phase autogenic changes such as the buildup of humus affect the habitat, and one plant community replaces
- Stabilization: A supposedly stable climax community forms.

What is difference between Commensalism and Mutualism?

In ecology, commensalism is a class of relationships between two organisms where *one organism benefits from the other without affecting it adversely or favourably*. This is in contrast with mutualism, in which both organisms benefit from each other, amensalism, where one is harmed while the other is unaffected, and parasitism, where one benefits while the other is harmed.

Examples of Commensalism

- Once a lion has finished its meal, a vulture swoops down and finishes off the carcass. The relation between lion and vulture is commensalism.
- Many orchids use trees as a surface to grow.

What is a Pioneer Community?

A pioneer community is a collection of organisms able to colonize bare rock. Lichens help break down rock and accumulate debris, helping to form a thin soil layer. The soil layer begins to support small forms of life.

What is Green Washing?

Greenwashing is green marketing, deceptively used to promote the perception that an organization's

aims and policies are environmentally friendly. Whether it is to increase profits or gain political support, green-washing may be used to manipulate popular opinion to support otherwise questionable aims.

What is Captive Breeding?

Captive breeding is the process of breeding animals in human controlled environments with restricted settings, such as wildlife reserves, zoos and other conservation facilities; sometimes the process is construed to include release of individual organisms to the wild, when there is sufficient natural habitat to support new individuals or when the threat to the species in the wild is lessened. *Captive Breeding is an Ex-situ mode of conservation.*

Captive breeding programs facilitate biodiversity and may save species from extinction. *However, such programs may also reduce genetic diversity and species fitness. Captive breeding techniques are usually difficult to implement for highly mobile species like some migratory birds (e.g. cranes) and fishes (e.g. Hilsa). Species like large cetaceans (whales, dolphins, etc.) may also have some difficulties as it would be hard to meet their biological requirements in captivity, especially the vast amount of space required to keep large populations.*

What are First and Second Generation Alcohols?

The first generation is produced from *various sources of carbohydrates* such as Sugarcane, Potato, Wheat, Rice etc. Second generation is the *Lignocellulogic alcohol produced from Cellulose*. The sources can be stalks, leaves, bagasse, and husks of rice, wheat, wood chips, sawdust etc. It is very difficult to commercially produce second generation alcohol.

What are different Categories in IUCN Red List of Threatened Species?

Various Categories in IUCN Red List of Threatened species are as follows:

- Extinct (EX) – No individuals remaining.
- Extinct in the Wild (EW) – Known only to survive in captivity
- Critically Endangered (CR) – Extremely high risk of extinction in the wild.
- Endangered (EN) – High risk of extinction in the wild.
- Vulnerable (VU) – High risk of endangerment in the
- Near Threatened (NT) – Likely to become endangered in the near future.
- Least Concern (LC) – Lowest risk.

What are India's Natural World Heritage Sites?

The Natural properties of India in World Heritage List are: Kaziranga National Park (1985), Keoladeo National Park (1985), Manas Wildlife Sanctuary (1985), Nanda Devi and Valley of Flowers National Parks (1988) and Sundarbans National Park (1987).

Which elements play role in Biological Nitrogen Fixation?

Iron, Molybdenum as well as Phosphorous play important role in BNF. Nitrogen fixation needs an

enzyme called nitrogenase. The nitrogenase enzyme has two kinds of proteins viz. Iron Protein, and Iron-Molybdenum protein. Similarly, leguminous plants that are NZ fixing will usually require more P than similar plants supplied fertilizer N. Nodules are an important P sink, and commonly have the highest concentration of that element in the plant. This is because of the high energy cost of N2 fixation and the cost of building and maintaining functioning nodules.

Why Oxygen-18 is used in Palaeoclimatology?

The Mountain Glaciers and the polar ice caps/ice sheets have been widely used in paleo-climatology. This is done by studying the Ice Cores. Ice Cores are samples of the accumulated snow and ice over many years which got recrystallized and trapped air bubbles from previous time periods. The presence of Hydrogen and Oxygen Isotopes in these ice cores has helped to redraw a picture of the climate at the time. This is called Ice Coring. The lee coring projects have yielded data of the climates of hundreds of years back and European Project for Ice Coring in Antarctica has yielded data of over Siakh years back. The changes in the Oxygen-IS quantity in the ice layers represent changes in average ocean surface temperature. This is because the water molecules containing the heavier 0-18 evaporate at a higher temperature than water molecules containing the normal Oxygen-16 isotope. The ratio of 0-18 to 0-16 is relatively higher as temperature increases and relatively less as temperature decreases. This ratio can be used to determine the temperature of precipitation through time.

Why Salt Mines are used as safest means of Radioactive Waste Disposal?

Currently, the Salt mines are considered to be the safest means for the disposal of the Radioactive Wastes. The reasons are that salt heals its own fractures because of its plastic quality; and good quality salt beds are separated from ground water. Further, the salt Beds have property of great seismic stabilit. *Kindly note that Salt does not absorb any radiation.*

What is Pardhi community's initiative to save lesser floricans?

The Pardhi community in central India has been a nomadic community of hunters. Phase Pardhis, one of the subgroups within the community, were known for their skill in catching birds with phase (traps). Traditional hunters Phase Pardhis are part of an initiative to save critically endangered lesser floricans.

Why coal is worst environmental polluter?

Coal is considered to be the worst environmental pollutant when burnt because of its sulphur content and traces of mercury *as well as radioactive material*.

What is Global Warming Potential?

Global-warming potential (GWP) is a relative measure of how much heat a greenhouse gas traps in the atmosphere. It compares the amount of heat trapped by a certain mass of the gas in question to the amount of heat trapped by a similar mass of carbon dioxide.

What are components of Producer Gas?

Producer gas is created out of the biomass gasification i.e. incomplete combustion of biomass resulting in production of combustible gases consisting of Carbon Monoxide (CO), Hydrogen (H2) and traces of Methane (Ch4). Producer gas can be used to run internal combustion engines (both compression and spark ignition) in vehicles; as a substitute for furnace oil in direct heat applications; produce methanol in an economically viable way.

What is Difference between Alligators and Crocodiles?

Both these reptiles belong to same order Crocodilia, alligators are classified under Alligatoridae family, whereas crocodiles are members of the Crocodylidae family. In regards to the habitat comparison of alligators and crocodiles, both spend their life in and near water bodies and lay their eggs on land.

But the difference is alligators prefer a freshwater habitat, while crocodiles prefer to live in brackish water or saltwater. Alligators have a broader 'U' shaped snout, whereas the snout shape of crocodiles is narrow and form a V towards the end.

The tooth placement is also a distinguishing feature to demarcate alligators and crocodiles. The jaw placement of an alligator is such that the upper jaw is wider and covers the lower jaw completely. In

case of a crocodile, the width of the upper and lower jaw are the same, hence, the teeth in the lower jaw become apparent after the mouth is closed. Dermal Pressure Receptors (DPRs) are small, black, sensory pits that help in detecting changes in the water pressure. Both in alligators and crocodiles, DPRs serve as an important organ for locating their prey. In alligators, DPRs are present only around the jaw, whereas in crocodiles, these sensory organs are present in nearly every scale of the body.

Both alligators and crocodiles have structurally modified salivary glands (salt glands) in the tongue. The crocodiles use these salt glands for excreting excess salt from the body, whereas in alligators, these salt glands are non functional. This is the reason as to why, a crocodile can tolerate saline water, whereas an alligator cannot.

What are the fishes that are not actually fishes?

Some of the animals whose name is suffixed by fish but none of them is a true fish.

- Jelly fish- Aurelia (Coelenterate)
- Shell fish- a) oyster and other mollusks b) Lobster and other crustaceans
- Razor fish- Used both for a true fish Xyrichthyes species as well as Solen, a bivalve.
- Silver fish – Lepisma (a mollusc)
- Cuttle fish- Sepia (a mollusc)
- Devil fish- Octopus(a mollusc)
- Whale – Whale (Aquatic mammal)

- Starfish- Asterias (Echinoderm)

What are the Tiger Range Countries?

The 13 Tiger Range Countries (TRCs) are Bangladesh, Bhutan, China, India, Indonesia, Cambodia, Laos, Malaysia, Myanmar, Nepal, Russia, Thailand and Vietnam. In these countries, only 6 subspecies exist viz. Sumatran, Bengal, Amur, Indochinese, South China and Malayan tiger.

What is Southern Birdwing?

The Southern Birdwing is a large and striking Swallowtail butterfly endemic to Peninsular India. With a wingspan of 140–190 mm, it is the largest butterfly found in southern India. You may note that Grass Jewel is the smallest butterfly of India and Atlas Moth is the largest moth found in India.

What is Leq symbol in context with Noise Pollution?

As per the ambient noise standards, that have been notified for different categories like, industrial, commercial and residential areas and silence zones etc, for residential areas, 55 dB (A) Leq during 'day time' and 45 dB (A) Leq during 'night time' for residential areas have been fixed. Leq is a symbol that represents "Equivalent Continuous Noise Level". Usually the signal that you are measuring is varying in amplitude.Leq noise levels are logarithmic (dB) values and cannot be added directly. A doubling of sound level results in a measured increase of 3 dB, four identical sources in a room would increase the noise level by 6 dB and so on.

What are importance of Seabuckthorn?

Seabuckthorn is a medicinal plant found in the Himalayan region. Our country holds tremendous potential in respect of Seabuckthorn fruit production and diverse varieties which have health-promoting properties and can play a crucial role in preventing soil erosion and help nitrogen fixation in cold and desert areas. This is the most important environmental benefit of the Seabuckthron. Seabuckthorn fruit grows in the cold deserts of Ladakh region of Jammu and Kashmir, Lahul-Spiti in Himachal Pradesh and some parts of Arunachal Pradesh. The UPA Government had launched a National Mission on Seabuckthorn.

What are the Animals that show Hibernation?

Select species of animals enters into the state of animal dormancy to avoid damage from adverse season. Examples of such animals are Polar Bear, Tortoises, Crocodiles, Salamanders etc.

During Hibernation period metabolic rate is reduced. In fact, it is a mechanism of survival. Amphibians like toad and frog undergo hibernation. Hibernation is also seen in female polar bears. Aestivation is an opposite process of hibernation. Some animals go under the ground during the dry season of summer. In zoology it is a state of inactivity and reduced metabolic activity that occurs during the dry season in species such as lungfish and snails.

What are Hope Spots?

The International Union for Conservation of Nature (IUCN) declares some places around the world

as "Hope Spots". Hope Spots are the places which are critical to the health of Ocean Life. A Hope Spot is an area of ocean that merits special protection because of its wildlife and significant underwater habitats.

What is common in Nepenthes and Tropical Sundew?

Both Nepenthes khasiana & Tropical sundew (Drosera burmannii) plants are found in the Khasi Hills of North East India. Both are insectivorous and both are endangered.

What are various Impacts of Tillage on soil health?

Tillage is an important factor that decreases soil quality. Reduced tillage practices could increase Soil Organic Matter and moisture content of the soil, and also improve the soil food web. However, there is a great disadvantage in reduced tillage that it requires a greater use of herbicides due to the increased spread of weeds and soil pathogens. If this is not taken into account, it may affect the crop yields due to the increased prevalence of pathogens, pests, diseases and weeds. Reduced tillage often leads to retention of soil residues and reduction in the emission of carbon dioxide to the atmosphere. This can sustain the soil biota in a healthy state and also maintains the physical and chemical properties of the soil.

What is Bio-stimulation?

Bio-stimulation refers to addition of nutrients to soil to stimulate the growth of indigenous microflora

What is Bioventing?

Bioventing refers to addition of gases such as oxygen or methane to stimulate activity of microflora

What is Bioaugmentation?

Bioaugmentation refers to inoculation of soil with exogenous microorganisms

What is Soil sealing?

Soil sealing refers to mixing toxic soil with healthy soil.

How cell phone towers are responsible for dwindling numbers of House Sparrows

- The House sparrow (Passer domesticus) was once a common sight in our cities and its number has gone down drastically in recent years. The electromagnetic pollution from mobile phone towers *harms its reproductive cycle.*
- Further, while the older ones feed on grains, the younger ones peck on insects. Due to the rapid encroachment of green space, use of insecticides, pesticides and herbicides food has become scarce for the birds. Starvation has killed a majority of them.
- Nesting was another problem. Due to the rapid growth in the high-rise buildings, nesting became a big issue for the birds. [The Hindu]

What is importance of Sunn Hemp in soil Improvement?

Sunn hemp has been used extensively as a soil improvement or green manure crop in the tropics

because of its ability to produce large amounts of biomass in as little as 60 to 90 days. Because of this, it has the potential to build organic matter levels and sequester carbon. Also, as a legume it can fix large amounts of nitrogen. Used as a cover crop, sunn hemp can improve soil properties, reduce soil erosion, conserve soil water, and recycle plant nutrients. 'Tropic Sun' is also resistant to root-knot nematodes. [The Hindu]

What is Albedo?

Albedo is the fraction of the solar radiation reflected back. Increased air pollution would cause global dimming and would reduce the solar radiation reflected back. Polar Ice Caps increase the Earth's albedo. When Polar Icecaps get melted, the bare earth will reflect less solar light. Thus first two options are incorrect.

We should note that over-pastured land and bare soil are more reflective of solar radiation than are crops and vegetation. A desert is much more reflective than a savanna or forest. If economic pressure on soil and vegetation increases, and drought then occurs, the effect overall is to increase the albedo of the surface.

What is Lessepsian migration?

Lessepsian migration is the ongoing migration of marine species across the Suez Canal, usually from the Red Sea to the Mediterranean Sea, more rarely in the opposite direction. It is named after Ferdinand de Lesseps, the engineer in charge of the canal's construction. Invasive species originated from the Red Sea and introduced into the Mediterranean by the construction of the canal have become a major component of the Mediterranean ecosystem, and have serious impacts on the Mediterranean ecology, endangering many local and endemic Mediterranean species.

What is a Zoophyte?

A zoophyte is an animal that visually resembles a plant. An example is a sea anemone

What is contribution of Polar ice packs in the environment of earth?

There are two distinct roles played by Polar Ice Packs towards Earth's Environment. *Firstly,* the Polar ice packs retrain the release of methane from the arctic permafrost. Arctic methane release triggered by a breakdown in sea ice could cause an abrupt climate change event, potentially similar in some ways to the Paleocene-Eocene thermal maximum event, or to the great dying, a mass extinction event. *Secondly,* Polar ice packs reduce heat loss from the oceans. Sea ice has an important effect on the heat balance of the polar oceans, since it insulates the (relatively) warm ocean from the much colder air above, thus reducing heat loss from the oceans. Sea ice has a high albedo — about 0.6 when bare, and about 0.8 when covered with snow — compared to the sea – about 0.15 – and thus the ice also affects the absorption of sunlight at the surface. The sea ice cycle is also an important source of dense (saline) "bottom water". While freezing, water rejects its salt content (leaving pure ice). The remaining surface water, made dense by the extra salinity, sinks, leading to the productions of dense

water masses such as Antarctic Bottom Water. This production of dense water is a factor in maintaining the thermohaline circulation, and the accurate representation of these processes is an additional difficulty to climate modelling.

Which countries share Amazon Rainforest?

The Amazon Rainforest covers most of the Amazon Basin of South America. This region includes territory belonging to nine nations. The majority of the forest is contained within Brazil, with 60% of the rainforest, followed by Peru with 13%, Colombian Amazon with 10%, and with minor amounts in, Venezuela, Ecuador, Bolivia, Guyana, Suriname and France (French Guiana). States or departments in four nations bear the name Amazonas after it. The Amazon represents over half of the planet's remaining rainforests, and it comprises the largest and most species-rich tract of tropical rainforest in the world.

What are Invasive Species?

Invasive species are those that are introduced—intentionally or unintentionally—to an ecosystem in which they do not naturally appear and which threaten habitats, ecosystems, or native species. These species become invasive due to their high reproduction rates and by competing with and displacing native species, that naturally appear in that ecosystem. Unintentional introduction can be the result of accidents (e.g. when species escape from a zoo), transport (e.g. in the ballast water of a ship); intentional introduction can be the result of e.g. importing animals or plants or the genetic modification of organisms.

Examples of Invasive Species

Congress Grass

The Congress Grass (Parthenium hysterophorus) inhibits the germination and growth of many plants and induces hay fever, asthma, skin rashes, and eczema in human beings. Toxic to animals, it can also taint mutton and make dairy milk unpalatable owing to its odour.

Water hyacinth (Eichhornia crassipes):

Aquatic plant of tropical South America that flourishes in warm climates in Central America, North America, Africa, Asia, Australia and New Zealand. The hyacinth grows in thick rafts, deoxygenating the water for other species and impeding water flow and navigation.

What is Holocene Extinction?

Holocene is a geological epoch which began around 12,000 to 11,500 years ago and continues to the present. The scientists propose that a Sixth Extinction of biodiversity is going on currently in this Holocene epoch, which started around 10,000 BC. The large number of extinctions span numerous families of plants and animals including mammals, birds, amphibians, reptiles and arthropods. The Holocene extinction includes the disappearance of large mammals known as megafauna, starting between 9,000 and 13,000 years ago, the end of the last Ice Age. Such disappearances are considered

to be results of both climate change and the proliferation of modern humans. These extinctions are sometimes referred to as the Quaternary extinction event. All of us are witnessing this Holocene extinction.

What is Bioprospecting?

Bioprospecting is the process of discovery and commercialization of new products based in biological resources. Bioprospecting often draws on indigenous knowledge about uses and characteristics of plants and animals. Thus, Bioprospecting includes Biopiracy, the exploitative appropriation of indigenous forms of knowledge by commercial actors, as well as the search for previously unknown compounds in organisms that have never been used in traditional medicine.

What is Biopiracy?

In Biopiracy, indigenous knowledge of nature, originating with indigenous peoples, is used by others for profit, without permission from and with little or no compensation or recognition to the indigenous people themselves.

Representing one of the most agriculturally bio-diverse nations in the world, India has become a primary target for biopiracy. In a first, in 1995, a firm in United States had successfully applied for a patent on a technique to extract an antifungal agent from the neem tree (Azadirachta indica), which grows throughout India and Nepal. This was a case of biopiracy as the Indian people have long understood the tree's medicinal value. The efforts on part of Government of India led to cancellation of the patent. Similarly, in 2000, US Corporation RiceTec attempted to patent certain hybrids of basmati rice and semi dwarf long-grain rice. The Indian government intervened and several claims of the patent were invalidated.

The most recent case of biopiracy is the first ever bio-piracy case by National Biodiversity Authority against the developers of Bt brinjal, which has been discussed later in these modules.

What is the Japanese Whaling Issue?

Japan has a long tradition of whale hunting "because eating whale meat is an old and impenetrable Japanese tradition". Earlier they used to trap whales into nets or harpooned them; the commercial whaling received a boost with the introduction of steam ships and grenade tipped harpoon guns.

The whaling was confined to Pacific Ocean until 1934, but since then, the Japanese expanded their whaling to Antarctica. Whales helped keep Japanese citizens fed both during and after World War 2. In 1947 whale meat made up almost half of all animal protein consumed by the country. Nearly 20 years later, whales continued to make up nearly one-quarter of the Japanese diet.

In 1946, International Convention for the Regulation of Whaling was signed. This convention governs commercial, scientific, and aboriginal subsistence whaling practices of fifty-nine member nations. By this convention, International Whaling Commission (IWC) was set up to "provide for the proper conservation of whale stocks and thus make possible the orderly development of the

whaling industry".

In 1986, IWC had adopted a moratorium on commercial whaling. This ban still continues but somehow Japanese continue doing commercial whaling. Why? Japan has exploited an ambiguity in the 1986 global moratorium that allows "lethal research on the mammals". What Japanese do is to keep hunting the whales in the name of this "lethal research".

Why Oxytocin is used in Veterinary?

Bihar State Health Society (BSHS) has imposed an immediate ban on over-the-counter sale of oxytocin injections which are illegally manufactured in some parts of the state. Dairy farmers use oxytocin to increase milk in pregnant cows and farmers use it to ripen fruits and vegetables. But food laced with oxytocin can have adverse health effects in humans. It can reduce heart rate, cause low blood pressure, damage the brain, cause seizures in foetuses and lead to uterine rupture.

What is Double digging?

Double digging is a gardening technique used to increase soil drainage and aeration. It involves the loosening of two layers of soil, and the addition of organic matter. Double-digging is a key component of the biodynamic method of cultivation.