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INFUSION NOTES
WHEN ONLY THE BEST WILL DO

U.P.S.C.

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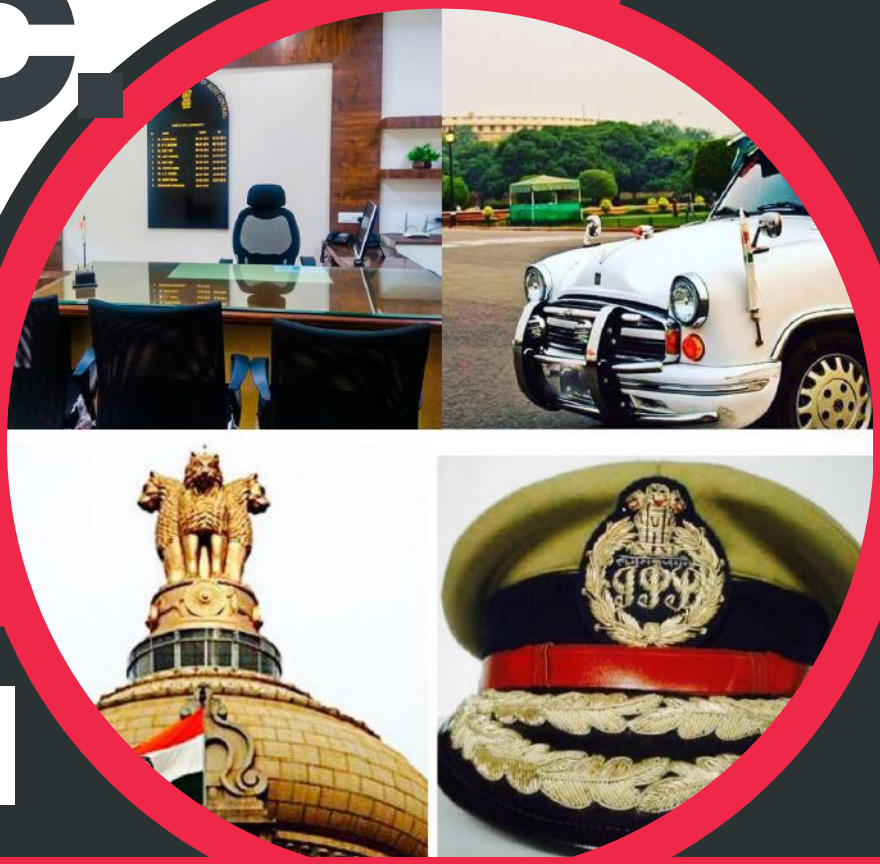

LATEST EDITION

HANDWRITTEN NOTES

PRE+ MAINS

General Study paper - 3

Part – 4 Environment, Ecology and Biodiversity

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UNION PUBLIC SERVICE COMMISSION (U.P.S.C.)

GENERAL STUDY PAPER – 3

Part – 4 Environment, Ecology and Biodiversity

PREFACE

Dear Aspirants, Presented Notes ***"UPSC – CSE (PRE + MAINS)"*** *have been prepared by a team of teachers, colleagues and toppers who are expert in various subjects.*

These notes will help the Aspirants to the fullest extent possible in the examination Of Civil Services conducted by the ***UNION PUBLIC SERVICE COMMISSION (UPSC).***

Finally, despite careful efforts, there may be chances of some shortcomings and errors in the notes / So your suggestions are cordially invited in Infusion notes.

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SR. NO.	CHAPTER NAME	PAGE NO.

        - Major Community
        - Minor Communities
        - Structure of a community
    - Ecosystem
        - Abiotic components
        - Biotic components
        - Functions of an Ecosystem
        - Types of Ecosystems
        - Natural ecosystems
        - Man Made ecosystems
        - Productivity of ecosystems
        - Environmental Factors Affecting Productivity in the Ecosystem
    - Classification of Natural Ecosystem
        - Terrestrial
            - Forest
            - Grasslands
            - Deserts
        - Aquatic
            - Fresh Waters
            - Saline Waters
            - Marine Waters
    - Goods and Services provided by ecosystems include
    - Threats to Ecological Goods and Services

- Biome
        - Types of Biome
        - Tundra
        - Boreal Forest (Taiga)
        - Temperate Forest
        - Grasslands (Steppe)
        - Desert
        - Tropical Deciduous Forest and Savannah
        - Tropical Rainforest
    - Aquatic Zones
    - Types of Aquatic Ecosystem
- Biosphere

- Secondary succession
- Autogenic Succession
- Allogenic Succession
- Autotrophic Succession
- Heterotrophic Succession
- Sambhar Lake
- Avian Botulism

3. Terrestrial Ecosystem & Types Of Forest In India **30**

- Terrestrial Ecosystem
- Terrestrial environments are segmented into
- Terrestrial ecosystems are
    - Forests
        - Tropical rain forests
        - Temperate deciduous forests
        - Boreal or north coniferous forests
        - Importance of Forests
        - Deforestation
        - Causes of Deforestation
    - The main causes of deforestation are
        - Agriculture
        - Shifting cultivation
        - Demand for firewood
        - Urbanization and developmental projects
        - Forest Fires
        - Effects of Deforestation
        - Climate Imbalance
        - Increase in Global Warming
        - Soil Erosion
        - Floods
        - Wildlife Extinction
        - Strategies to Reduce Deforestation

    - Grasslands
        - Importance of Grassland
        - Impact of Grazing

CHAPTER - 1

ENVIRONMENT AND ECOLOGY

Ecology 'oikos' meaning home or place to live in and **'logos'** meaning study. Literally it is the study of the home of nature.

Ecology is defined as a scientific study of the relationship of the living organisms with each other and with their environment.

It deals with the way in which organisms are moulded by their environment, how they make use of environmental resources including energy flow and mineral cycling.

History of Ecology

The roots of Ecology lie in natural history, which is as old as human civilization itself. Since early history, man has indulged in Ecology in a practical sort of way, knowingly and unknowingly. In primitive societies every individual was required to have an intimate knowledge of his environment for their survival. i.e about the forces of nature and of plants and animals around him/her.

Our ancient Indian texts have references to ecological principles.The classical texts of the Vedic period such as the Vedas, the Samhitas, the Brahmanas and the Aranyakas-Upanishads contain many references to ecological concepts.

The Indian treatise on medicine, the Charaka-Samhita and the surgical text Sushruta-Samhita, show that people during this period had a good understanding of plant and animal ecology.

These texts contain classification of animals on the basis of habit and habitat, land in terms of nature of soil, climate and vegetation; and description of plants typical to various localities. Charaka- Samhita contains information that air, land, water and seasons were indispensable for life and polluted air and water were injurious to health.

ENVIRONMENT AND ITS COMPONENT

Everything that surrounds or affects an organism during its lifetime is collectively known as its environment.The environment is defined as 'the sum total of living, non-living components; influences and events, surrounding an organism.

All organisms (from virus to man) are obligatorily dependent on the other organism and environment for food, energy, water, oxygen, shelter and for other needs.

The relationship and interaction between organisms and the environment are highly complex. It comprises both living (biotic) and non-living (abiotic) components.

The environment is not static. Both biotic and abiotic factors are in a flux and keep changing continuously.

Components of Environment

I.Abiotic

- Energy
- Radiation
- Temperature & heat flow
- Water
- Atmospheric gases and wind
- Fire
- Gravity
- Topography
- Soil
- Geologic substratum

2.Biotic

- Green plants
- Non-green plants
- Decomposers
- Parasites
- Symbionts
- Animal
- Man

External environment of fish

Its environment consists of abiotic components such as light, temperature, including the water in which nutrients, oxygen, other gases and organic matter are dissolved.

The biotic environment consists of microscopic organisms called plankton which it assumes as well as aquatic plants, animals and decomposers.

Internal environment of fish

- It is enclosed by the outer body surface.
- The internal environment is relatively stable as compared to the external environment.
- .However, it is not absolutely constant. Injury, illness or excessive stress upsets the internal environment.
- For example, if a marine fish is transferred to a freshwater environment, it will not be able to survive.

What is Ecology and Environment?-

Everything that a man needs comes from his surrounding environment viz. food, fuel, water, shelter, energy, etc. It is the same for other living beings. But Man, over the periods to quench his thirst, exploited nature so much that now the environment is not able to reach its homeostasis.

- Homeostasis is the tendency of organisms to auto-regulate and maintain its internal environment in a stable state.

There is widespread degradation of the environment, extinction of animals and plant species, loss of forests, pollution of air, water, and sound. All this had been done without the proper assessment of the consequences of the acts of humans on the environment.

Thus, it is important to understand the environment before we do further damage to the earth which is our Home.

The study of ecology helps in the following way:-

- **Environmental Conservation**: By studying ecology, the emphasis is put on how each species needs the other for peaceful coexistence. Lack of understanding of ecology has led to degradation of land and environment which is home to other species thus leading to extinction and endangerment of species because of lack of knowledge e.g. dinosaurs, mammoths, white shark, black rhinos, sperm whales, etc.

- **Resource allocation**: All the plants and animals need to share limited natural resources such as air, minerals, space, and environment. Lack of ecological know-how has led to deprivation and looting of these natural resources leading to scarcity as well as exploitation and competition.

- **Energy Conservation**: All species require energy whether light, radiation, nutrition, etc. Poor understanding of ecology is seeing the destruction of the energy resources e.g. non-renewable sources like

oil, coal, natural gas, and also pollution and destruction of the Ozone layer.

- **Eco-Friendliness**: Ecology helps to appreciate harmonious living among the species; this will ensure the natural order of things is followed.

What `Ecology' Really Is?

- **'Ecology may be defined as the scientific study of the relationship of living organisms with each other and with their environment.'**
- The term ecology was first coined in 1869 by the German biologist Ernst Haeckel. It has been derived from two Greek words, 'Oikos', meaning home or estate, and 'logos' meaning study.
- **The emphasis is on relationships between organisms and the components of the environment namely abiotic (non-living) and biotic (living).**
- It deals with the ways in which organisms are molded by their environment, how they make use of environmental resources including energy flow and mineral cycling.

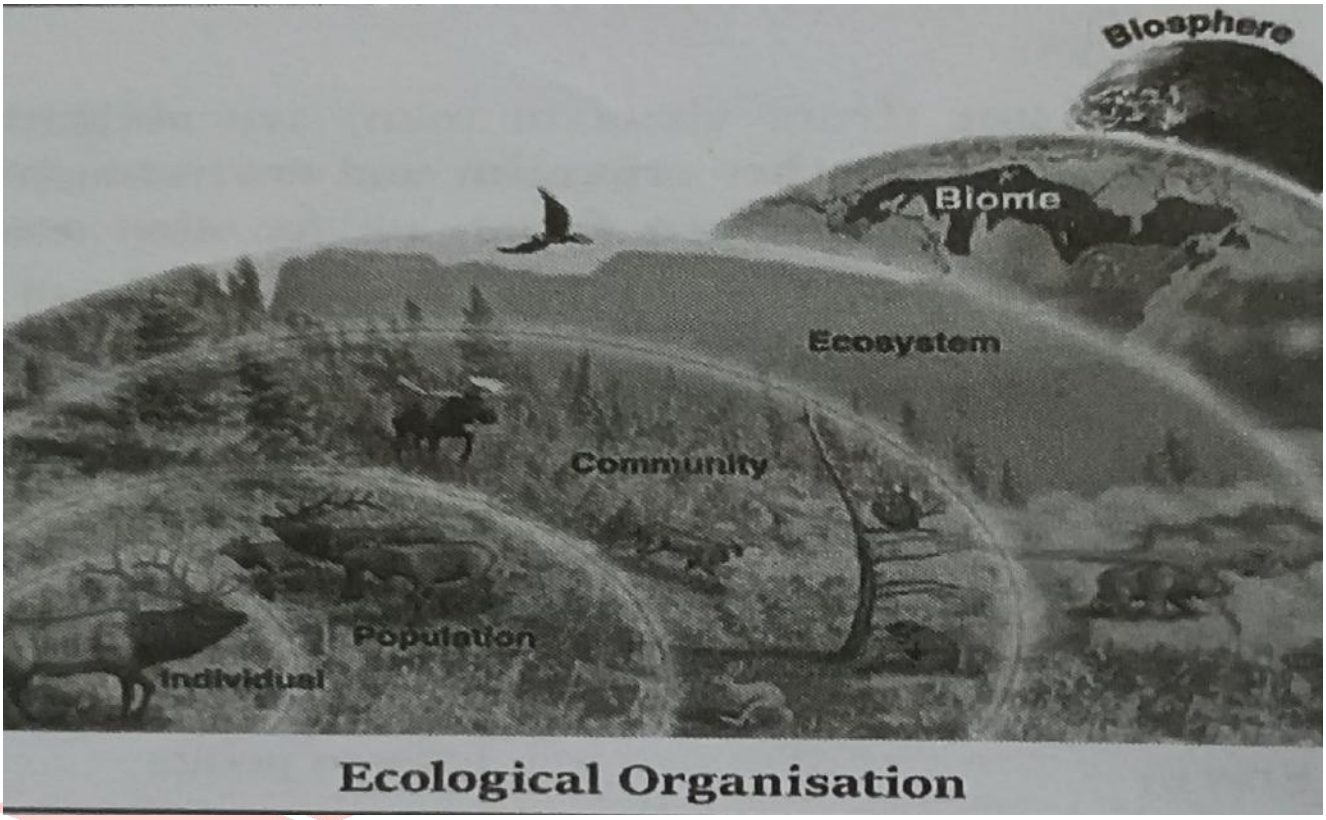
When and how did the ecology start?

- **The genesis ecology is as old as human civilization. In primitive societies, every individual was required to have an intimate knowledge of his environment for their survival, i.e., about the forces of nature and of plants and animals around him.**
- The Indian classical ancient texts have references to the principles of ecology. The ancient Vedas, the Samhitas, the Brahmanas, and the Aranyakas-Upanishads contain many references to ecological concepts.
- The Indian treatise on medicine, the Charaka Samhita, and the surgical text SusrutaSamhita show that people during this period had a good understanding and knowledge of plant and animal ecology.
- **We came to know that ecology is the 'scientific study of the relationship of living organisms with each other and their environment'.**

What is the Environment?

- **Everything that surrounds or affects an organism during its lifetime is collectively known as its environment which comprises both living (biotic) and nonliving (abiotic) components.**
- **All organisms (from virus to man) are obligatorily dependent on the environment for food, energy, water, oxygen, shelter, and other needs.**
- The environment is defined as 'the sum total of living, non-living components; influences and events surrounding an organism'.
- And we can say that this environment constitutes two components viz. **abiotic and biotic components.** These both are not static but are in flux and keep on changing continuously.
- **Biotic components are living. Example plants, animals, parasites, decomposers, Man, etc.**
- **Abiotic components are non-living. Example energy, radiation, heat flow, water, soil, air, etc.**
- The relationship and interaction between organisms and the environment are highly complex. No organism can live alone without interacting with other organisms. So, each organism has other organisms as a part of its environment. Each and everything with which we interact or which we need for our sustenance forms our environment.

Levels of organization in ecology –



Levels of organization in ecology

Ecology is a science that studies the interdependent, mutually reactive and interconnected relationship between the organisms and their physical environment on the one hand and among the organisms on the other hand.

Ecology not only deals with the study of the relationship of individual organisms with their environment, but also with the study of populations, communities, ecosystems, biomes, and biosphere as a whole.

The main levels of organization in ecology are six and are as follows.

- *Individual*
- *Population*
- *community*
- *Ecosystem*
- *Biome*
- *Biosphere*

Individual

The organism is an individual living being that has the ability to act or function independently. It may be a plant, animal, bacterium, fungi, etc.It is a body made up of organs, organelles, or other parts that work together to carry out the various processes of life.

Population

A population is a group of organisms usually of the same species, occupying a defined area during a specific time.Population growth rate is the percentage variation between the number of individuals in a population at two different times. Therefore the population growth rate can be positive or negative.

The main factors that make the population increase are birth and immigration.

cat, dog, etc.) and omnivores organisms feeding upon both plants and animals e.g. human, pigs and sparrow.

Decomposers: Also called **saprotrophs**. These are mostly bacteria and fungi that feed on decomposed and the dead organic matter of plants and animals by secreting enzymes outside their body on the decaying matter. They play a very important role in the recycling of nutrients. They are also called detritivores or detritus feeders.

Functions of an Ecosystem

Ecosystems are complex dynamic systems. They perform certain functions. These are:

- Energy flow through the food chain
- Nutrient cycling (biogeochemical cycles)
- Ecological succession or ecosystem development
- Homeostasis (or cybernetic) or feedback control mechanisms

Ponds, lakes, meadows, marshlands, grasslands, deserts and forests are examples of the natural ecosystems. Many of you have seen an aquarium; a garden or a lawn etc. in your neighborhood. These are a man-made ecosystem.

Types of Ecosystems

Ecosystems are classified as follows

- Natural ecosystems
- Man Made ecosystems

Natural ecosystems:

Totally dependent on solar radiation e.g. forests, grasslands, oceans, lakes, rivers, and deserts. They provide food, fuel, fodder, and medicines.

Ecosystems are dependent on solar radiation and energy subsidies (alternative sources) such as wind, rain and tides. e.g. tropical rain forests, tidal estuaries, and coral reefs.

Man-made ecosystems:

- Dependent on solar energy. e.g.- agricultural fields and aquaculture ponds.
- Dependent on fossil fuel e.g. urban and industrial ecosystems.

Productivity of ecosystems

The rate of biomass production is called productivity. The portion of fixed energy, a trophic level passes on to the next trophic level is called production.

Productivity in ecosystems is of two kinds, i.e., primary and secondary.

Green plants fix solar energy and accumulate it in organic forms as chemical energy. As this is the first and

The basic form of energy storage, the rate at which the energy accumulates in the green plants or producers is known as primary productivity.

Productivity is a rate function and is expressed in terms of dry matter produced or energy captured per unit area of land, per unit time.

Productivity is a rate function and is expressed in terms of dry matter produced or energy captured per unit area of land, per unit time.

It is more often expressed as energy in calories/cm2/yr or dry organic matter in g/m2/yr (g/m2 x 8.92 = lb/acre). Hence, the productivity of different ecosystems can be easily compared.

its "profession" (i.e. activities and responses specific to the species).

The term niche means the sum of all the activities and relationships of a species by which it uses the resources in its habitat for its survival and reproduction.

Or

A niche is the unique functional role or place of a species in an ecosystem.

A niche is unique for a species while many species share the habitat. No two species in a habitat can have the same niche. This is because if two species occupy the same niche they will compete with one another until one is displaced. For example, a large number of different species of insects may be pests of the same plant but they can co-exist as they feed on different parts of the same plant.

Types of Niche

- **Habitat niche** – where it lives
- **Food niche** – what is eating or decomposes & what species it competes with
- **Reproductive niche** – how and where it reproduces.
- **Physical & chemical niche** – temperature, land shape, land slope, humidity, and other requirements.

Biome

The terrestrial part of the biosphere is divisible into enormous regions called biomes, which are characterized by climate, vegetation, animal life, and general Soil type.

No two biomes are alike. The climate determines the boundaries of the biome and abundance of plants and animals found in each one of them. The most important climatic factors are temperature and precipitation.

Types of Biome

1. TUNDRA

- Treeless low (less than 1 m) vegetation with short perennials, water frozen.
- Typical plants include sedges, lichens, mosses, grasses, and dwarf woody plants.
- Typical animals include snowy owls, musk ox, reindeer, polar bears, and migrant birds.
- Very cold, often dry climate, but with the permanently frozen ground creating saturated soils during summer months. Arctic Tundra is circumpolar (scanty Antarctic).

2.BOREAL FOREST (TAIGA)

- Dense evergreen needle-leafed forest.
- Typical plants include white spruce, black spruce, and jack pine.
- Typical animals include moose, black bears, wolves, and migrant birds.
- Cold winters with deep snow, but longer growing season than the tundra. The warm-month average temperature is greater than 100 C. Periodic fires are common.

3. TEMPERATE FOREST

- Dense forest with thin, broad, deciduous leaves; or rainforests typically dominated by conifers. Tall trees with single boles creating deep shade. Understories are often sparse.
- Typical plants include maples, oaks, elms (deciduous) spruce or araucaria (rainforest).
- Typical animals include deer and squirrels.

- *Freezing winters and warm, wet summers and a longer growing season than the boreal forest.*

4. GRASSLANDS (STEPPE)

- *Treeless vegetation less than 1 m high.*
- *Typical plants include grasses and members of the sunflower family. Woody plants predominate in steppes.*
- *Typical animals include large grazing ungulates such as horses, buffalo, and rhinoceros.*
- *Cold or warm winters with growing seasons moisture too dry for trees; fires every 1- 5 years.*

5. DESERT

- *Sparse drought-resistant vegetation, typically spiny and with tiny leaves and photosynthetic bark.*
- *Typical plants include cactuses, acacias, and short-lived annuals.*
- *Typical animals include reptiles and ground-dwelling rodents.*
- *Precipitation is low (less than 250 mm/yr) and evapotranspiration high (more than 250 mm/yr). Temperature is generally high. Fires generally are rare due to low biomass.*

6. TROPICAL DECIDUOUS FOREST AND SAVANNAH

- *Thorny forest, woodlands, or scattered trees, many of which loose leaves during the dry season.*
- *Typical plants include acacias and grasses.*
- *Typical animals include giraffes and elephants.*
- *Warm frost-free winters, hot usually-wet summers, and a pronounced dry season. Fire and grazing are important vegetation-forming processes.*

7. TROPICAL RAINFOREST

- *Dense tall evergreen forest.*
- *Typical plants include strangler figs and tree ferns.*
- *Typical animals include snakes and birds.*
- *Mild frost-free winters and summers with year-round rain.*

AQUATIC ZONES

Aquatic systems are not called biomes; however, they are divided into distinct life zones, with regions of relatively distinct plant and animal life. The major differences between the various aquatic zones are due to salinity, levels of dissolved nutrients; water temperature, depth of sunlight penetration.

Types of Aquatic Ecosystem:

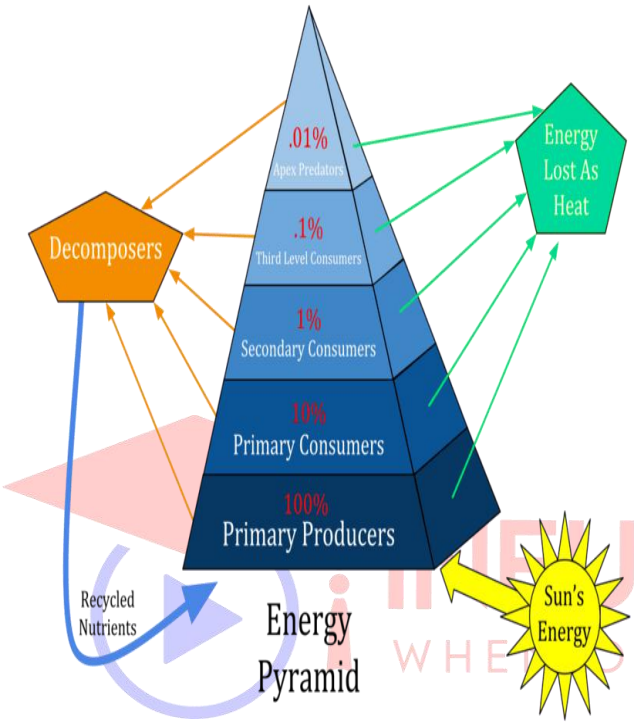
- ***Fresh Water Ecosystem***- *The freshwater ecosystem is classified as lotic (moving water) or lentic (still or stagnant water). The lotic water system includes freshwater streams, springs, rivulets, creeks, brooks,*
- *and rivers. Lentic water bodies include pools, ponds, some swamps, bogs, and lakes. They vary considerably in physical, chemical, and biological characteristics.*

- ***Marine Ecosystem*** – *Nearly three-quarters of the earth's surface is covered by the ocean with an average depth of 3,750 m and with salinity 35 ppt, (parts per thousand), about 90 percent of which is sodium chloride.*

- ***Estuaries*** – *Coastal bays, river mouths, and tidal marshes from the estuaries. In estuaries, freshwater from rivers meets ocean water and the two are mixed by the action of tides. Estuaries are highly productive as compared to the adjacent river or sea.*

Pyramid of Energy:

This pyramid represents the total amount of energy at each trophic level. Energy is expressed in terms of rate such as kcal/unit area /unit time or cal/unit area/unit time. E.g. in a lake autotroph energy is 20810 kcal/m/year. Energy pyramids are never inverted.



Ecological Efficiency

It is clear from the trophic structure of an ecosystem that the amount of energy decreases at each subsequent trophic level. This is due to two reasons:

- At each trophic a part of the available energy is lost in respiration or used up in metabolism.
- A part of the energy is lost at each transformation, i.e. when it moves from lower to higher trophic level as heat.

The ratio between the amount of energy acquired from the lower trophic level and the amount of energy transferred from the higher trophic level is called ecological efficiency.

Lindman in 1942 defined these ecological efficiencies for the 1st time and proposed a 10% rule e.g. if autotrophs produce 100 cal, herbivores will be able to store 10 cal. and carnivores 1 cal. However, there may be slight variations in different ecosystems and ecological efficiencies may range from 5 to 35%.

When energy moves between trophic levels, 10% of the energy is made available for the next level. (The exception is the transition from the sun to producers, in which case only 1% of the energy is retained.)

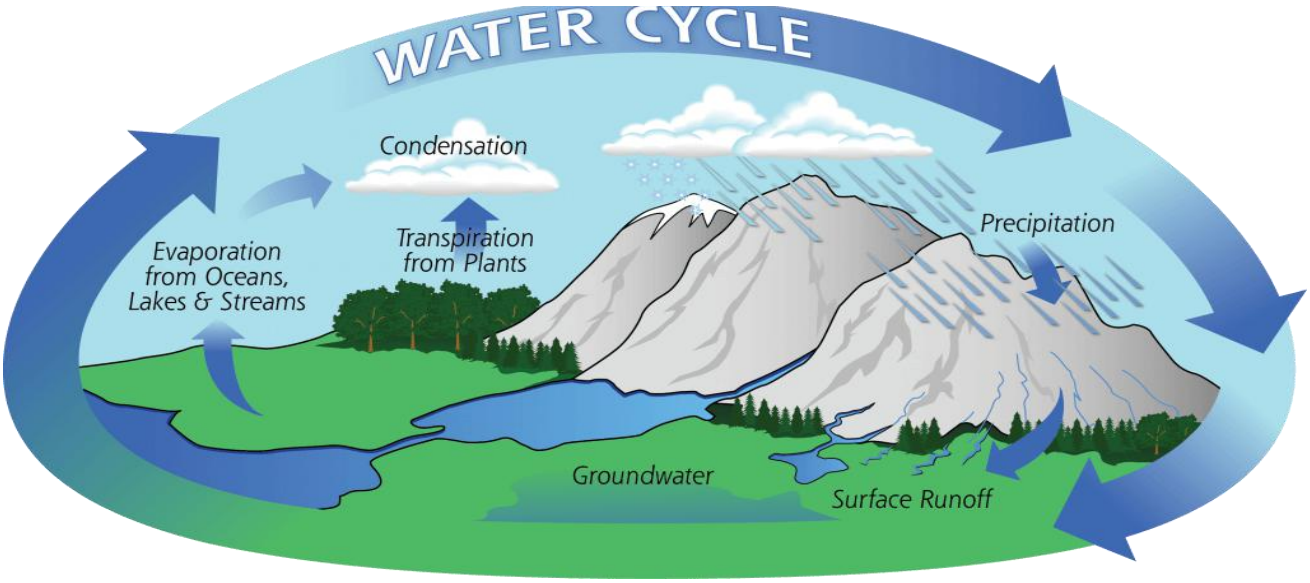
When a consumer eats a plant, it gains energy from the plant. That energy is used for growth, reproduction, and other biological processes. Some of that energy is also lost through heat loss. Thus, when a predator eats that consumer, all of the energy the consumer gained from the plant is not available to the predator: it has been used and lost.

As we move up an energy pyramid or a trophic level, we can see that less and less of the original energy from the sun is available. Roughly ten percent of the previous trophic level's energy is available to the level immediately higher up. This is called the 10% Rule.

Significance of studying food chains:

- It helps in understanding the feeding relations and interactions among different organisms of an ecosystem.
- It explains the flow of energy and circulation of materials in ecosystems.
- It helps in understanding the concept of biomagnification in ecosystems.

Water Cycle



Water is essential for life. No organism can survive without water. Precipitation (rain, snow, slush dew etc.) is the only source of water on the earth. Water received from the atmosphere on the earth returns back to the atmosphere as water vapor resulting from direct evaporation and through evapotranspiration the continuous movement of water in the biosphere is called water cycle (hydrological cycle). You have already studied that earth

is a watery planet of the solar system, about 2/3rd of the earth surface is covered with water. However, a very small fraction of this is available to animals and plants.

Water is not evenly distributed throughout the surface of the earth. Almost 95 % of the total water on the earth is chemically bound to rocks and does not cycle. Out of the remaining 5%, nearly 97.3% is in the oceans and 2.1% exists as polar ice caps. Thus only 0.6% is present as freshwater in the form of atmospheric water vapors, ground and soil water.

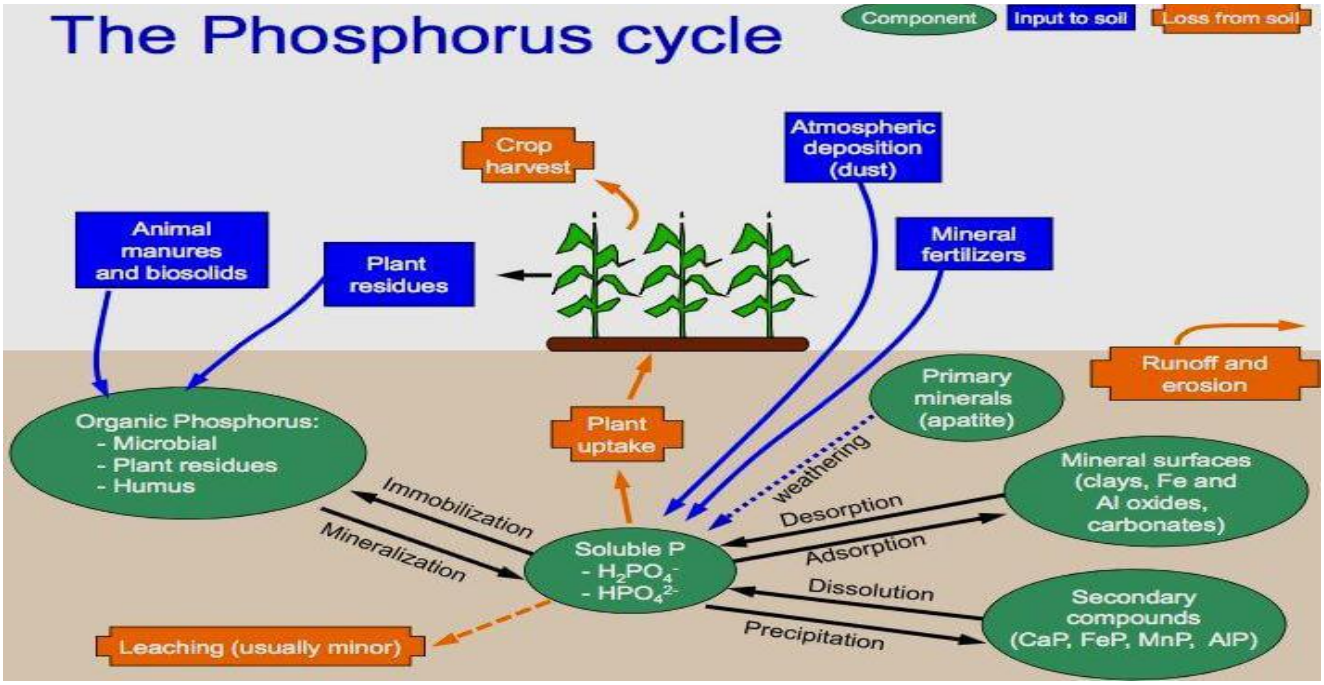
The driving forces for the water cycle are 1) solar radiation 2) gravity. Evaporation and precipitation are the two main processes involved in the water cycle. These two processes alternate with each other. Water from oceans, **lakes, ponds, rivers and streams evaporates by the sun's heat energy.** Plants also transpire huge amounts of water. Water remains in the vapor state in air and forms clouds that drift with the wind. Clouds meet with the cold air in the mountainous regions above the forests and condense to form rain precipitate which comes down due to gravity.

On an average 84% of the water is lost from the surface of the through oceans by evaporation. While 77% is gained by it from precipitation. Water runoff from lands through rivers to oceans makes up 7% which balances the evaporation deficit of the ocean. On land, evaporation is 16% and precipitation is 23%.

Sedimentary Cycle

Magnesium, phosphorus and calcium circulate by means of the sedimentary cycle. The sedimentary cycle normally does not cycle through the atmosphere but follows a basic pattern of flow through erosion, sedimentation, mountain building, volcanic activity and biological transport through the excreta of marine birds.

Phosphorus Cycle



Phosphorus is an important element for all forms of life. As phosphate (PO4), it makes up an important part of the structural framework that holds DNA and RNA together. Phosphates are also a critical component of ATP, the cellular energy carrier as they serve as an energy release for organisms to use in building proteins or contracting muscles. Like calcium, phosphorus is important to vertebrates; in the human body, 80% of phosphorus is found in teeth and bones.

Phosphorus plays a central role in aquatic ecosystems and water quality. Phosphorus occurs in large amounts as a mineral in phosphate rocks and enters the cycle from erosion and mining activities. This is the nutrient considered to be the main cause of excessive growth (eutrophication) of rooted and free-floating microscopic plants in lakes.

While obviously beneficial for many biological processes, in surface waters an excessive concentration of phosphorus is considered a pollutant. Phosphate stimulates the growth of plankton and plants, favoring weedy species over others. Excess growth of these plants tends to consume large amounts of dissolved oxygen, potentially suffocating fish and other marine animals, while also blocking available sunlight to bottom-dwelling species. This is known as eutrophication.

The main storage for phosphorus is in the earth's crust. On land phosphorus is usually found in the form of phosphates. By the process of weathering and erosion phosphates enter rivers and streams that transport them to the ocean.

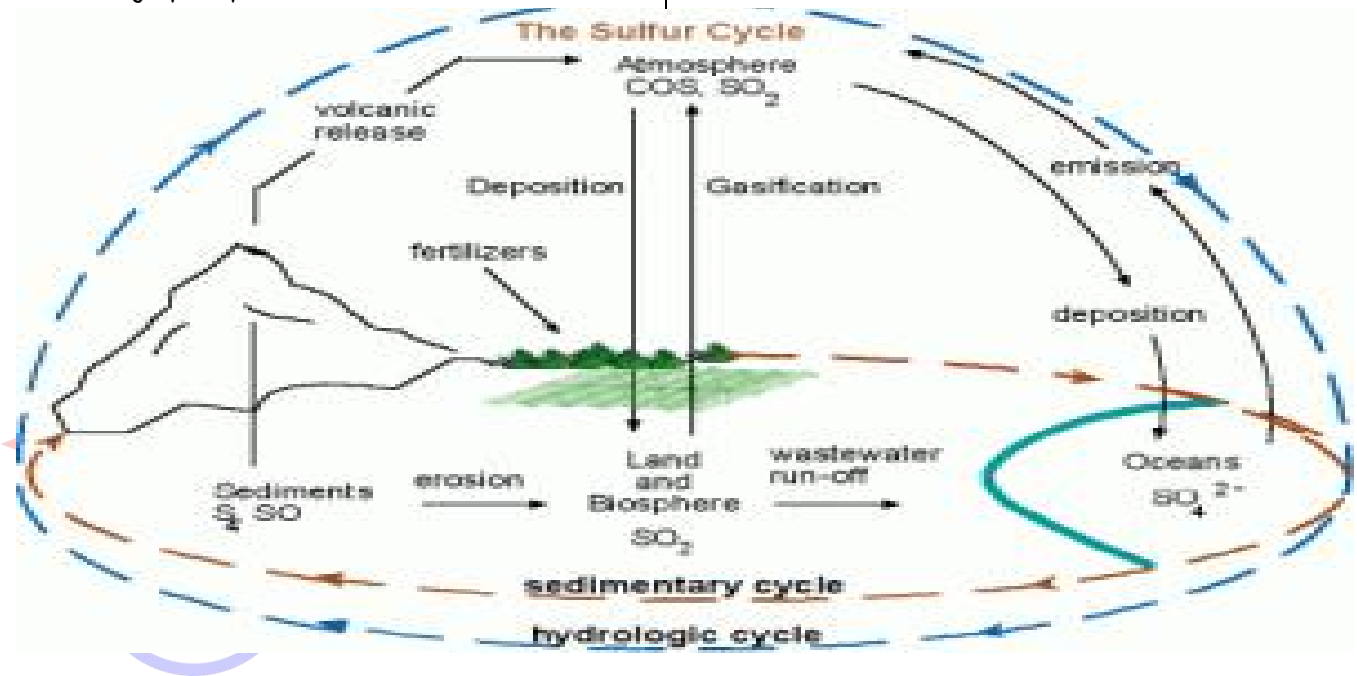
In the ocean once, the phosphorus accumulates on continental shelves in the form of insoluble deposits. After millions of years, the crustal plates rise from the seafloor and expose the phosphates on land. After more time, weathering will release them from rock and the cycle's geochemical phase begins again.

Humans can alter the phosphorus cycle in many ways, including in the cutting of tropical rain forests and through the use of agricultural fertilizers. Rainforest ecosystems are supported primarily through the recycling of nutrients, with little or no nutrient

reserves in their soils. As the forest is cut and/or burned, nutrients originally stored in plants and rocks are quickly washed away by heavy rains, causing the land to become unproductive.

Agricultural runoff provides much of the phosphate found in waterways. Crops often cannot absorb all of the fertilizer in the soils, causing excess fertilizer runoff and increasing phosphate levels in rivers and other bodies of water. At one time the use of laundry detergents contributed to significant concentrations of phosphates in rivers, lakes, and streams, but most detergents no longer include phosphorus as an ingredient.

Sulphur Cycle



Sulfur is one of the components that make up proteins and vitamins. Proteins consist of amino acids that contain sulfur atoms. Sulfur is important for the functioning of proteins and enzymes in plants, and in animals that depend upon plants for sulfur. Plants absorb sulfur when it is dissolved in water. Animals consume these plants, so that they take up enough sulfur to maintain their health.

Most of the earth's sulfur is tied up in rocks and salts or buried deep in the ocean in oceanic sediments. Sulphur can also be found in the atmosphere. It enters the atmosphere through both natural and human sources. Natural resources can be for instance volcanic eruptions, bacterial processes, evaporation from water, or decaying organisms. When Sulphur enters the atmosphere through human activity, this is mainly a consequence of

industrial processes where sulphur dioxide (SO2) and hydrogen sulphide (H2S) gases are emitted on a wide scale.

When sulphur dioxide enters the atmosphere, it will react with oxygen to produce Sulphur trioxide gas (SO3), or with other chemicals in the atmosphere, to produce Sulphur salts. Sulphur dioxide may also react with water to produce Sulphur acid (H2SO4). Sulphur acid may also be produced from dimethyl-sulfide, which is emitted to the atmosphere by plankton species.

All these particles will settle back onto the earth or react with rain and fall back onto earth as acid deposition. The particles will

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प्रिय दोस्तों, अब तक हमारे विभिन्न नोट्स में से विभिन्न परीक्षाओं में आये हुए प्रश्नों के परिणाम –

EXAM (परीक्षा)	EXAM DATE	हमारे नोट्स में से आये हुए प्रश्न
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CHAPTER - 12

RAMSAR SITES IN INDIA WITH MAP (UPDATED)

Wetland

A wetland is a distinct ecosystem that is flooded by water, either permanently or seasonally, where oxygen-free processes prevail. *The primary factor that distinguishes wetlands from other landforms or water bodies is the characteristic vegetation of aquatic plants, adapted to the unique hydric soil.*

The Convention uses a broad definition of wetlands. It includes ***all lakes and rivers,*** *underground aquifers, swamps and marshes, wet grasslands, peatland, oases, estuaries, deltas, and tidal flats, mangroves, and other coastal areas, coral reefs, and all human-made sites such as fish ponds, rice paddies, reservoirs, and salt pans.*

Significance of Wetlands

- *Wetlands are a critical part of our natural environment. They mitigate floods, protect coastlines and build community resilience to disasters, reduce the impacts of floods, absorb pollutants and improve water quality.*
- *Wetlands are critical to human and planet life. More than 1 billion people depend on them for a living and 40% of the world's species live and breed in wetlands.*
- *They are a vital source for food, raw materials, genetic resources for medicines, and hydropower.*
- *30% of land-based carbon is stored in peatland.*
- *They play an important role in transport, tourism, and the cultural and spiritual well-being of people.*
- *Many wetlands are areas of natural beauty and many are important to Aboriginal people.*

Threats:

- *As per the IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services)'s global assessment wetlands are the most threatened ecosystem.*
- *Wetlands are disappearing 3 times faster than forests due to human activities and global warming.*
- *According to UNESCO, the threat to wetlands will have an adverse impact on 40% of the world's flora and fauna that live or breed in wetlands.*
- ***Major threats:*** *Agriculture, development, pollution, and climate change.*

IPBES:

- *IPBES is an independent intergovernmental body established to strengthen the science-policy interface for biodiversity and ecosystem services for the conservation and sustainable use of biodiversity, long-term human well-being, and sustainable development.*
- *It was established in Panama City (US), in April 2012.*
- *It is not a United Nations body.*

Ramsar Convention on Wetlands

The term was coined when the International ***Treaty for the Conservation and Sustainable use of Wetlands was signed at a city of Iran called Ramsar in 1971.***

It is also known as the Convention on Wetlands.

Ramsar Convention is a convention on wetlands that was signed in 1971 in the

Iranian city of Ramsar. The negotiations for the convention started in the 1960s by the different countries and NGOs for the protection of wetland habitats of migratory waterbirds. Finally, it came into force in **1975**.

February 2 is celebrated as International Wetlands Day as the Ramsar Convention was signed on February 2, 1971.

The Ramsar Convention works with the collaboration of the following organizations:

- International Union for Conservation of Nature (IUCN).
- Birdlife International.
- International Water Management Institute (IWMI).
- Wetlands International.
- Wildfowl & Wetlands Trust (WWT)
- WWF International

Under the "three pillars" of the Convention, the Contracting Parties commit to:

- work towards the wise use of all their wetlands;
- designate suitable wetlands for the list of Wetlands of International Importance (the "Ramsar List") and ensure their effective management;
- cooperate internationally on transboundary wetlands, shared wetland systems, and shared species.

Ramsar Sites:

Any Wetland site which has been listed under the Ramsar Convention that aims to conserve it and promote sustainable use of its natural resources is called a Ramsar Site.

At the time of joining the Convention, each Contracting Party undertakes to designate at least one wetland site for inclusion in the List of Wetlands of International Importance.

The inclusion of a "Ramsar Site" in the List embodies the government's commitment to take the steps necessary to ensure that its ecological character is maintained.

The Ramsar sites are maintained in **Montreux Record** to track any major ecological changes that might affect any of the wetland sites positively or in a reverse way.

- The Montreux Record is a register of wetland sites on the List of Ramsar wetlands of international importance where changes in ecological character have occurred, are occurring, or are likely to occur as a result of technological developments, pollution, or other human interference. It is maintained as part of the Ramsar List.
- At present, two wetlands of India are in Montreux Record:
- **Keoladeo National Park (Rajasthan) and**
- **Loktak Lake (Manipur).**

Note: Chilka Lake (Odisha) was placed in the record but was later removed from it.

There are currently over **2,400 Ramsar Sites on the territories of 171 Ramsar Contracting Parties across the world.** They cover over 2.5 million square kilometers, an area larger than Mexico.

- India is a party to the Ramsar Convention. India signed under it on 1st February 1982.
- **Sundarbans is the largest Ramsar Site of India.**
- Chilika Lake (Orissa) and Keoladeo National Park (Rajasthan) were recognized as the first Ramsar Sites of India.

- Renuka Wetland (Area – 20 ha) in Himachal Pradesh is the smallest wetland of India.
- World's First Ramsar site was identified in 1974, which was the Cobourg Peninsula in Australia.

Ramsar Sites in India:

- The Ramsar convention entered into force in India on 1 February 1982.
- All wetlands, irrespective of their location, size, ownership, biodiversity, or ecosystem services values, can be notified under the Wetlands Rules 2017, except river channels, paddy fields, human-made water bodies specifically constructed for drinking water, aquaculture, salt production, recreation, irrigation purposes, wetlands falling within areas covered under the **Indian Forest Act, 1927, Forest (Conservation) Act, 1980, Wildlife (Protection) Act, 1972 and the Coastal Regulation Zone Notification, 2011.**
- India has over 7 lakh wetlands, covering 4.5% of the country's area, yet none of the wetlands has been notified under domestic laws.
- **Wetlands are regulated under the Wetlands (Conservation and Management) Rules, 2017.**

List of Ramsar sites in India:

1.Ashtamudi Wetland–Kerala

2.Beas Conservation Reserve– Punjab

3 .Bhitarkanika Mangroves– Odisha

4.Bhoj Wetlands– Madhya Pradesh

5.chandra Taal– Himachal Pradesh

6.Chilika Lake– Odisha

7.Deepor Beel– Assam

8.East Kolkata Wetlands– West Bengal

9.Harike Wetlands– Punjab

10.Hokera Wetland– Jammu & Kashmir

11.Kanjli Wetland– Punjab

12.Keoladeo National Park– Rajasthan

13.Keshopur-Miami Community Reserve– Punjab

14.Kolleru lake– Andhra Pradesh

15.Loktak lake –Manipur

16.Nalsarovar Bird sanctuary–Gujarat

17.Nandur Madhyameshwar–Maharashtra

18.Nangal Wildlife Sanctuary– Punjab

19.Nawabganj Bird Sanctuary– Uttar Pradesh

20.Parvati Arga Bird Sanctuary– Uttar Pradesh

21.Point Calimere Wildlife and Bird Sanctuary– Tamil Nadu

22.Pong Dam lake– Himachal Pradesh

23.Renuka lake– Himachal Pradesh

24.Ropar Wetland– Punjab

25.Rudrasagar Lake– Tripura

26.Saman Bird Sanctuary– Uttar Pradesh

27.Samaspur Bird Sanctuary– Uttar Pradesh

28.Sambhar lake – Rajasthan

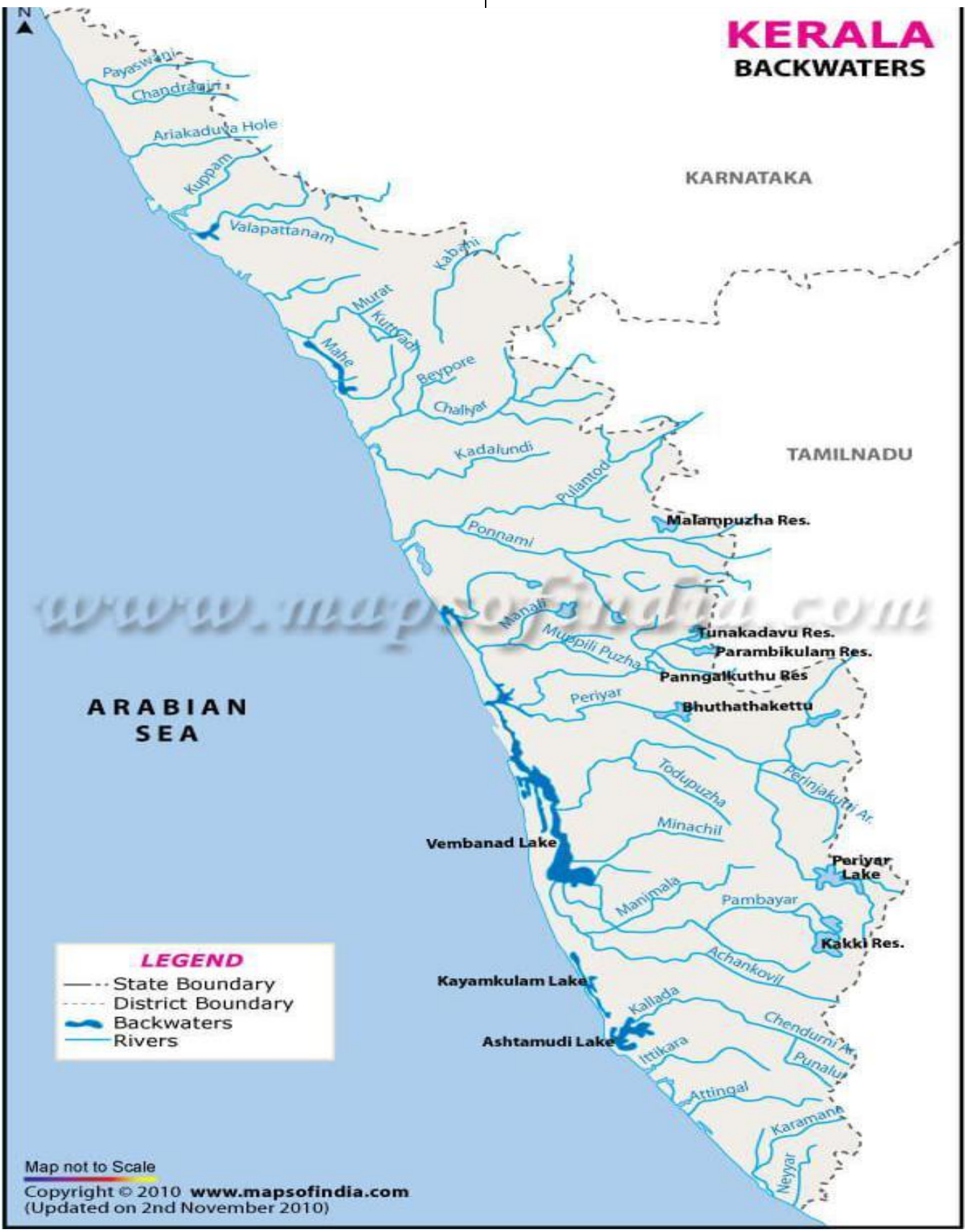
29.Sandi Bird Sanctuary– Uttar Pradesh

30.Sarsai Nawar Jheel– Uttar Pradesh

31.Sasthamkotta lake– Kerala

1. Ashtamudi Wetland

- It is a natural backwater in the Kollam district.
- River Kallada and Pallichal drain into it.
- It forms an estuary with the Sea at Neendakara (a famous fishing harbor in Kerala).
- National Waterway 3 passes through it.

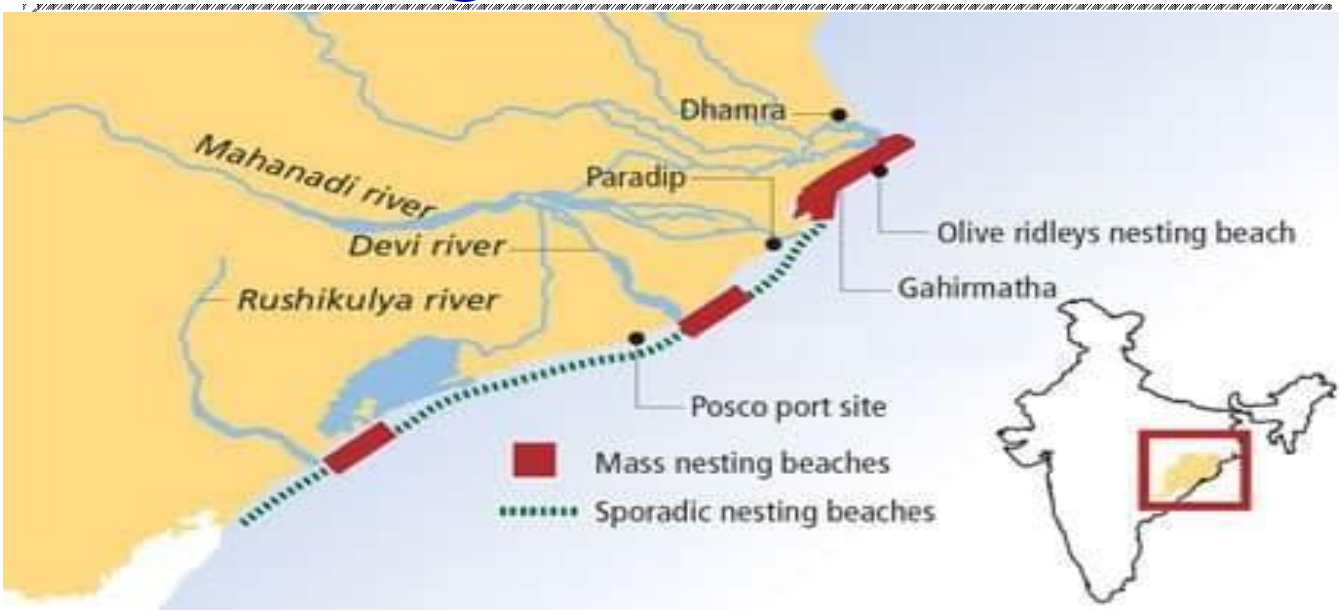


2. Beas Conservation Reserve

- It is a 185-kilometer stretch of the Beas River.
- The stretch is dotted with islands, sand bars, and **braided channels**.
- The Reserve hosts the only known population in India of the endangered **Indus river dolphin**.
- In 2017, a program was initiated to re-introduce the critically **endangered gharial**.

3. Bhitarkanika Mangroves

- It is part of Bhitarkanika Wildlife Sanctuary and designated as Ramsar Wetland of International Importance in 2002.
- Gahirmatha Marine Wildlife Sanctuary is adjacent to the Bhitarkanika Wildlife Sanctuary.
- It is famous for its saltwater crocodiles and Olive ridley sea turtles.
- The core area of Bhitarkanika Wildlife Sanctuary was declared Bhitarkanika National Park.
    - Bhitarkanika Wildlife Sanctuary includes **Gahirmatha Marine Wildlife Sanctuary.**
    - Bhitarkanikais located in the estuary of Brahmani, Baitarani, Dharma & Mahanadi river systems.



4. Bhoj Wetland

- The Wetland consists of two lakes located in the city of Bhopal.
- The two lakes are the Bhojtal and the Lower Lake.
- It is a human made reservoir.
- The largest bird of India, the sarus crane is found here.

5. Chandra Taal

- It is a high-altitude lake. Tso Chicken or Chandra Taal (meaning the Lake of the Moon), or Chandra Tal is a lake in the Lahaul part of the Lahaul and Spiti district of Himachal Pradesh.
- Chandra Taal is near the source of the Chandra River (a source river of the Chenab).
- It supports IUCN Red-listed Snow Leopard.
- Migratory species such as the Ruddy shelduck are found in summer.

6. Chilika Lake

- It is a brackish water lagoon at the mouth of the Daya River.
- It is the largest coastal lagoon in India.
- Birds from as far as the Caspian Sea, Lake Baikal, Aral Sea, and other remote parts of Central Asia, Ladakh, and the Himalayas come here.
- In 1981, Chilika Lake was designated the first Indian wetland of international importance under the Ramsar Convention.
- Nalbana Bird Sanctuary is the core area of the Ramsar designated wetlands of Chilika Lake.
- The Irrawaddy dolphin (critically endangered) is the flagship species of Chilika lake.
- Chilka is home to the only known population of Irrawaddy dolphins in India.
- Chilika Lake is claimed to have 20% of India's seagrass distribution, which plays a vital role in oxygen production and absorption of carbon dioxide and acts as a purifier in aquatic ecology.

7. Deepor Beel

- A permanent freshwater lake in a former channel of the Brahmaputra river.
- It is a few kilometers to the left of Guwahati whereas Pobitora Wildlife Sanctuary is around 35 km to the right.

8. East Kolkata Wetlands

- It is a multiple use wetland that serves the city of Kolkata.

9. Harike Wetland

- It is a shallow water reservoir at the confluence of the Beas and Sutlej rivers.
- It is an important site for breeding, wintering, and staging birds, supporting over 200,000 Anatidae (ducks, geese, swans, etc.) during migration.
- The Punjab government has planned to introduce amphibious vehicles which can run both on water and land at Harike wetlands.
- Reintroduction of wild gharials in the Beas river area of Harike wetlands.

10. Hokera Wetland

- It is only 10 km from Srinagar.
- It is a natural perennial wetland contiguous to the Jhelum basin.

11. Kanjli Wetland

- Kanjli Wetland, a man-made Wetland, which subsumes the Kanjli Lake, located in the Kapurthala district of Punjab was created by constructing the headworks across the perennial Bien River, a tributary of the Beas River to provide irrigation facilities to the hinterland.
- The stream is considered to be the most significant in the state from the religious point of view, as it is **associated with the first guru of the Sikhs, Shri Guru Nanak.**

12. Keoladeo National Park

- Formerly known as the **Bharatpur Bird Sanctuary**
- A complex of ten artificial, seasonal lagoons, varying in size.
- Vegetation is a mosaic of scrub and open grassland that provides habitat for breeding, wintering, and staging migratory birds.
- The invasive growth of the grass Paspalum distichum has changed the ecological character of large areas of the site,

40. Soor Sarovar Lake

- It is also known as Keetham lake situated within the Soor Sarovar Bird Sanctuary, which was declared as a bird sanctuary in the year 1991.
- **Location:**
- This lake is situated alongside the river Yamuna in Agra, Uttar Pradesh.
- The Soor Sarovar bird sanctuary covered an area of 7.97 sq km.
- It is today home to more than 165 species of migratory and resident birds.
- It also has a Bear Rescue center for rescued dancing bears.

41. Lonar Lake

- Lonar lake, situated in the Deccan Plateau's volcanic basalt rock, was created by the impact of a meteor 35,000 to 50,000 years ago.
- The lake is part of Lonar Wildlife Sanctuary which falls under the unified control of the Melghat Tiger Reserve (MTR).
- It is also known as a Lonar crater and is a notified National Geo-heritage Monument. Geo-heritage refers to the geological features which are inherently or culturally significant offering insight to earth's evolution or history to earth science or that can be utilized for education.
- It is the second Ramsar site in Maharashtra after Nandur Madhmeshwar Bird Sanctuary in the Nashik district.
- The water in the lake is highly saline and alkaline, containing special microorganisms like anaerobes, Cyanobacteria, and phytoplankton.

42. Tso Kar Wetland Complex (Tso Kar Lake)

- Ladakh's Tso Kar Wetland Complex has been recognized as a wetland of international importance, becoming India's 42nd Ramsar site. This is the second Ramsar site in the Union Territory of Ladakh. It is a high-altitude wetland complex, found at more than 4,500 meters above sea level in the Changthang region of Ladakh.
- The Tso Kar Basin is a high-altitude wetland complex, which comprises two principal waterbodies– Startsapuk Tso and Tso Kar Lake situated in Ladakh's Changthang region.
- Startsapuk Tso is a freshwater lake and Tso Kar is a hypersaline lake.
- The TSO Kar name means white lake and it was given because of the white salt efflorescence found on the margins of the wetlands due to the evaporation of highly saline water.
- The TSO Kar basin is categorized as A1 Category Important Bird Area (IBA) as per BirdLife International and is also a key staging site in the Central Asian Flyway.
- The basin is one of the most important breeding areas of the Black-necked Crane (Grus nigricollis) in India.
- It is also a major breeding area for the Bar-headed Geese (Anser Indicus), Great Crested Grebe (Podiceps Cristatus), Ruddy Shelduck (Tadornaferruginea), Lesser Sand-Plover (Charadrius Mongolus) and Brown-headed Gull (Larus Bunocephalus), and many other species.

Global Important Bird Area Criteria

Based on the criteria, the Global Important Bird Areas are classified as follows:

- **A1 Category:** Globally Threatened Species. The sites under this category hold a bird population that is categorized as Critically Endangered, Endangered or Vulnerable by the IUCN Red List of Threatened Species.
- **A2 Category:** Restricted Range species
- **A3:** Biome Restricted Species
- **A4:** Congregations

नोट – प्रिय IAS उम्मीदवारों, यहाँ हमने इस टॉपिक का मात्र SAMPLE ही दिया है, पूरा टॉपिक नही दिया है / यदि आपको हमारे नोट्स के सैंपल अच्छे लगे हों तो कम्पलीट नोट्स खरीदने के लिए नीचे दिए गये हमारे संपर्क नंबर पर कॉल कीजिए या लिंक पर क्लिक करें / दोस्तों, हमें पूर्ण विश्वास है कि ये नोट्स आपकी "UPSC IAS (PRE. & MAINS)" की परीक्षा में पूर्ण संभव मदद करेंगे और आप "INFUSION NOTES" के साथ IAS की परीक्षा में जरूर सफल होंगे, धन्यवाद /

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CHAPTER – 15

TIGER RESERVES IN INDIA & PROJECT TIGER

Tiger Reserves in India:

Tiger

- Tiger became the national animal of India in 1973 as the lion was a national animal before.
- Jim Corbett National Park was created in 1936 for tiger conservation
- Classified as Endangered as per IUCN Red Databook
- Schedule I animal as per Wildlife Protection Act, 1972
- Tiger can be killed under two conditions-
- Diseased or disabled beyond recovery
- The threat to human life
- In no case, the tiger can be declared vermin.

There are 53 tiger reserves in India that are governed by Project Tiger which is administered by the National Tiger Conservation Authority (NTCA).

India is home to 80 percent of tigers in the world. In 2006, there were 1,411 tigers which increased to 1,706 in 2010, 2,226 in 2014 and 2967 in 2018.

The Indian increase played a big role in driving up global populations as well; the number of wild tigers globally rose from 3,159 in 2010 to 3,890 in 2016 according to World Wildlife Fund and Global Tiger Forum.

The Indian increase played a big role in driving up global populations as well; the number of wild tigers globally rose from 3,159 in 2010 to 3,890 in 2016 according to World Wildlife Fund and Global Tiger Forum.

- Largest Tiger Reserve in India– Nagarjunsagar-Srisailam Tiger Reserve (Andhra Pradesh, Telangana)
- Smallest Tiger Reserve in India– Bor Tiger Reserve (Maharashtra)
- A tiger reserve is demarcated on the basis of 'core-buffer strategy' which includes:
- (i) Core zone
- (ii) Buffer zone

The world celebrated Global Tiger Day on July 29.

Global Tiger Forum

Global Tiger Forum is an Inter-Governmental international body working exclusively for the conservation of Tigers.

In 1993, an International Symposium on Tiger Conservation in New Delhi recommended the formation of an Inter-Governmental International Body that would embark on a Global Campaign for the Protection of Tigers.

- **Established in 1994, the Global Tiger Forum (GTF) has its headquarters in New Delhi.**
- The General Assembly of GTF meets after every three years.
- It utilizes cooperative policies, common approaches, technical expertise, scientific modules, and other appropriate programs.
- As per the Global Tiger Forum, it was set up to highlight the rationale for tiger preservation and provide leadership and a common approach throughout the world in order to safeguard the survival of the tiger, its prey, and its habitat.
- The Global Tiger Forum was set up to promote a worldwide campaign to save the tiger, its prey, and its habitat.
- The Global Tiger Forum has plans to promote a legal framework in the countries involved for biodiversity conservation and to increase the

protected area network of habitats of the tiger and facilitate their inter passages in the range countries.

- It is the only Inter-Governmental body to save the tiger worldwide.
- 14 tiger range countries are its members.
- At the St. Petersburg Tiger Summit in 2010, leaders of 13 tiger range countries resolved to double its number in the wild, with a popular slogan 'T x 2'.
- The Global Tiger Initiative (GTI) program of the World Bank brought global partners together to strengthen the tiger agenda.
- Over the years, the initiative has been institutionalized as a separate entity in the form of the Global Tiger Initiative Council (GTIC) with the Global Tiger Forum as one of its arms.
- GTF has forged viable partnerships with several like-minded organizations in India and abroad – IUCN, WWF, WCT, WII, IIFM, IFAW, WTI, WCS, USAID, World Bank, Clemson University.

Tx2

- The TX2 goal is a global commitment to double the world's wild tigers by 2022.
- The base year is 2006
- The goal has been set by the World Wildlife Fund (WWF) through the Global Tiger Initiative, Global Tiger Forum, and other critical platforms.
- All 13 tiger range governments came together for the first time at the St Petersburg Summit (Russia – 2010) where they committed to double the number of wild tigers by 2022.
- **India has already achieved it.**

Global Tiger Initiative (GTI)

- The Global Tiger Initiative (GTI) was launched in 2008 as a global alliance of governments, international organizations, civil society, conservation, and scientific communities, and the private sector, with the aim of working together to save wild tigers from extinction. In 2013, the scope was broadened to include Snow Leopards.
- The GTI's founding partners included the World Bank, the Global Environment Facility (GEF), the Smithsonian Institution, the Save the Tiger Fund, and International Tiger Coalition (representing more than 40 non-government organizations). The initiative is led by the 13 tiger range countries (TRCs).
- In November 2010, leaders of the tiger range countries (TRCs) assembled at an International Tiger Forum in St. Petersburg, Russia to adopt the St. Petersburg Declaration on Tiger Conservation and endorsed its implementation mechanism, called the Global Tiger Recovery Program. Their overarching goal was to double the number of wild tigers across their geographical area from about 3,200 to more than 7,000 by 2022.

Project Tiger

- There were 40000 tigers in 1900 but only 1800 left in 1972.
- Project Tiger was launched in 1973 with **9 tiger reserves for conserving our national animal, the tiger. Currently, the Project Tiger coverage has increased to 53, spread out in 18 tiger range states**.
- The tiger reserves are constituted on a core/buffer strategy. The core areas have the legal status of a national park or a sanctuary, whereas the buffer or peripheral areas are a mix of forest and non-forest land, managed as a multiple-use area.
- It is an ongoing Centrally Sponsored Scheme of the Ministry of Environment, Forests, and Climate Change providing central assistance to the tiger States for

- **Top Performers**: Madhya Pradesh saw the highest number of tigers (526) followed by Karnataka (524) and Uttarakhand (442).
- Increase in Tiger population: Madhya Pradesh (71%) > Maharashtra (64%) > Karnataka (29%).
- **Corbett Tiger Reserve in Uttarakhand has** the highest number of tigers
- **No tiger has been found in the Buxa (West Bengal), Palamau (Jharkhand), and Dampa (Mizoram) reserves**.

Tiger Task Force

- The implementation of Project Tiger over the years has highlighted the need for a statutory authority with the legal backing to ensure tiger conservation.
- On the basis of the recommendations of the National Board for Wild Life, a Task Force was set up to look into the problems of tiger conservation in the country.
- The recommendations of the Task Force include strengthening Project Tiger by giving it statutory and administrative powers.

National Tiger Conservation Authority

- **National Tiger Conservation Authority (NTCA) is a statutory body under the Ministry of Environment, Forests and Climate Change.**
- It was established in 2005 following the recommendations of the Tiger Task Force.
- It was constituted under enabling provisions of the Wildlife (Protection) Act, 1972, as amended in 2006, for strengthening tiger conservation, as per powers and functions assigned to it.

Wildlife Institute of India (WII)

- Wildlife Institute of India (WII) offers training programs, academic courses, and advisory in wildlife research and management.
- **Established in 1982.**
- **Established at Dehradun** (winter capital and the most populous city in Uttarakhand).
- It is an autonomous Institution of the Ministry of Environment & Forests.

Steps Taken by the Government for Tiger Conservation

Legal Steps

- Amendment of the Wild Life (Protection) Act, 1972 to Wild Life (Protection) Act, 2006 for providing enabling provisions towards constituting the National Tiger Conservation Authority and the Tiger and Other Endangered Species Crime Control Bureau.
- Enhancement of punishment in cases of an offense relating to a tiger reserve or its core area.

Administrative Steps

- Strengthening of anti poaching activities, including special strategy for monsoon patrolling.
- State-level Steering Committees under the Chairmanship of Chief Ministers and establishment of Tiger Conservation Foundation.
- Creation of Special Tiger Protection Force (STPF) [Budget 2008].

Financial Steps

- Financial and technical help is provided to the States under various Centrally Sponsored Schemes, viz. Project Tiger and Integrated Development of Wildlife Habitats.

International Cooperation

- India has a bilateral understanding with Nepal on controlling transboundary illegal trade in wildlife
- India has signed a protocol on tiger conservation with China.
- India has signed with Bangladesh for the conservation of the Royal Bengal Tiger.
- A sub-group on tiger/leopard conservation has been constituted for cooperation with the Russian Federation.
- A Global Tiger Forum of Tiger Range Countries has been created for addressing international issues related to tiger conservation.
- India is a party to CITES. CITES' landmark decision states that 'tigers should not be bred for trade in their parts and derivatives.

List of Tiger Reserves in India

1.Bandipur– Karnataka

2. Corbett– Uttarakhand

Amangarh (buffer of Corbett TR)-Uttar Pradesh

3.Kanha–Madhya Pradesh

4Manas–Assam

5.Melghat–Maharashtra

6.Palamau–Jharkhand

7.Ranthambore–Rajasthan

8.Similipal–Odisha

9.Sunderbans–West Bengal

10.Periyar–Kerala

11.Sariska–Rajasthan

12.Buxa–West Bengal

13.Indravati–Chhattisgarh

14.Namdapha –Arunachal Pradesh

15.Dudhwa–Uttar Pradesh

16.Kalakad-Mundanthurai–Tamil Nadu

17. Valmiki–Bihar

18.Pench–Madhya Pradesh

19.Tadoba-Andhari–Maharashtra

20.Bandhavgarh–Madhya Pradesh

21.Panna–Madhya Pradesh

22.Dampa–Mizoram

23.Bhadra–Karnataka

24.Pench–Maharashtra

25.Pakke–Arunachal Pradesh

26.Nameri–Assam

27.Satpura–Madhya Pradesh

28.Annamalai–Tamil Nadu

29Udanti-Sitanadi–Chhattisgarh

30.Satkosia–Odisha

31.Kaziranga– Assam

32.Achanakmar–Chhattisgarh

33.Dandeli-Anshi–Karnataka

34.Sanjay-Dubri–Madhya Pradesh

35.Mudumalai –Tamil Nadu

36.Nagarahole–Karnataka

37.Parambikulam–Kerala

38.Sahyadri– Maharashtra

39.Biligiri Ranganatha Temple– Karnataka

40.Kawal–Telangana

41.Sathyamangalam Tamil Nadu

42.Mukundra Hills–Rajasthan

43.Navegaon-Nagzira–Maharashtra

44.Nagarjunsagar Srisailam–Andhra Pradesh

45.Amrabad– Telangana

46.Pilibhit–Uttar Pradesh

47.Bor–Maharashtra

48.Rajaji Tiger Reserve–Uttarakhand

49.Orang Tiger Reserve–Assam

50.Kamlang Tiger Reserve–Arunachal Pradesh

51.Srivilliputhur-Mudumalai Tiger Reserve–Tamil Nadu

52. Ramgarh Vishdhari TR– Rajasthan

53.Guru Ghasidas TR –Chhattisgarh

11. Dudhawa, UP

- Billy Arjan Singh – famous for conservation of Tiger
- In the Terai belt of marshy grasslands of (Lakhimpur Kheri district) northern Uttar Pradesh.
- Swamp deer, Sambar deer, barking deer, spotted deer, hog deer, sloth beer, ratel, jackal, civets, jungle cats, fishing cat, leopard cat.
- It is the only place in the U.P. where both Tigers and Rhinos can be spotted together.
- It comprises of:
- Dudhwa National Park through which Suheli and Mohana streams flow,
- Kishanpur Wildlife Sanctuary through which Sharda River flows, and
- Katarniaghat Wildlife Sanctuary through which Geruwa River flows.
- All of these rivers are tributaries of the Ghagra River.

12. Pilibhit, UP

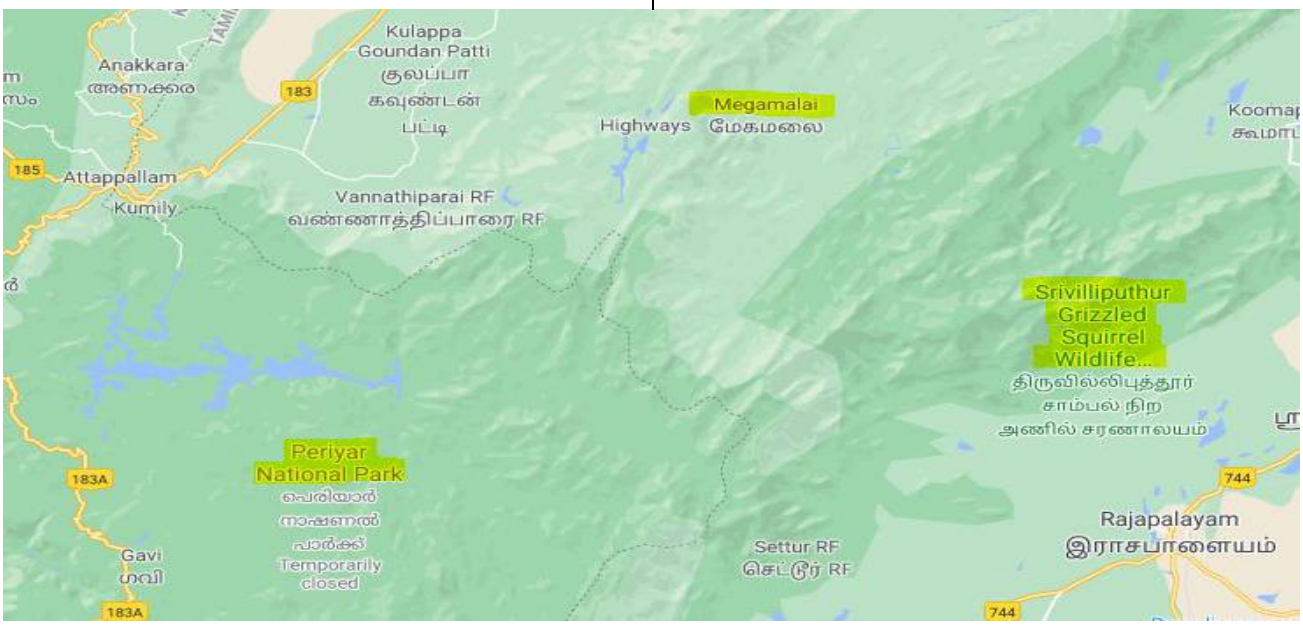
- Pilibhit, Lakhimpur Kheri, Bahraich districts
- In 2020, it bagged international award Tx2 for doubling up the number of tigers in the past four years.
- River Sharada(Mahakali), River Ghagra
- It forms part of Terai Arc Landscape in the upper Gangetic Plain.
- The northern edge of the reserve lies along the Indo-Nepal border while the southern boundary is marked by the river Sharada and Khakra.
- Wild animals include tiger, swamp deer, bengal florican, leopard, etc.
- It has high sal forests, plantations, and grasslands with several water bodies.

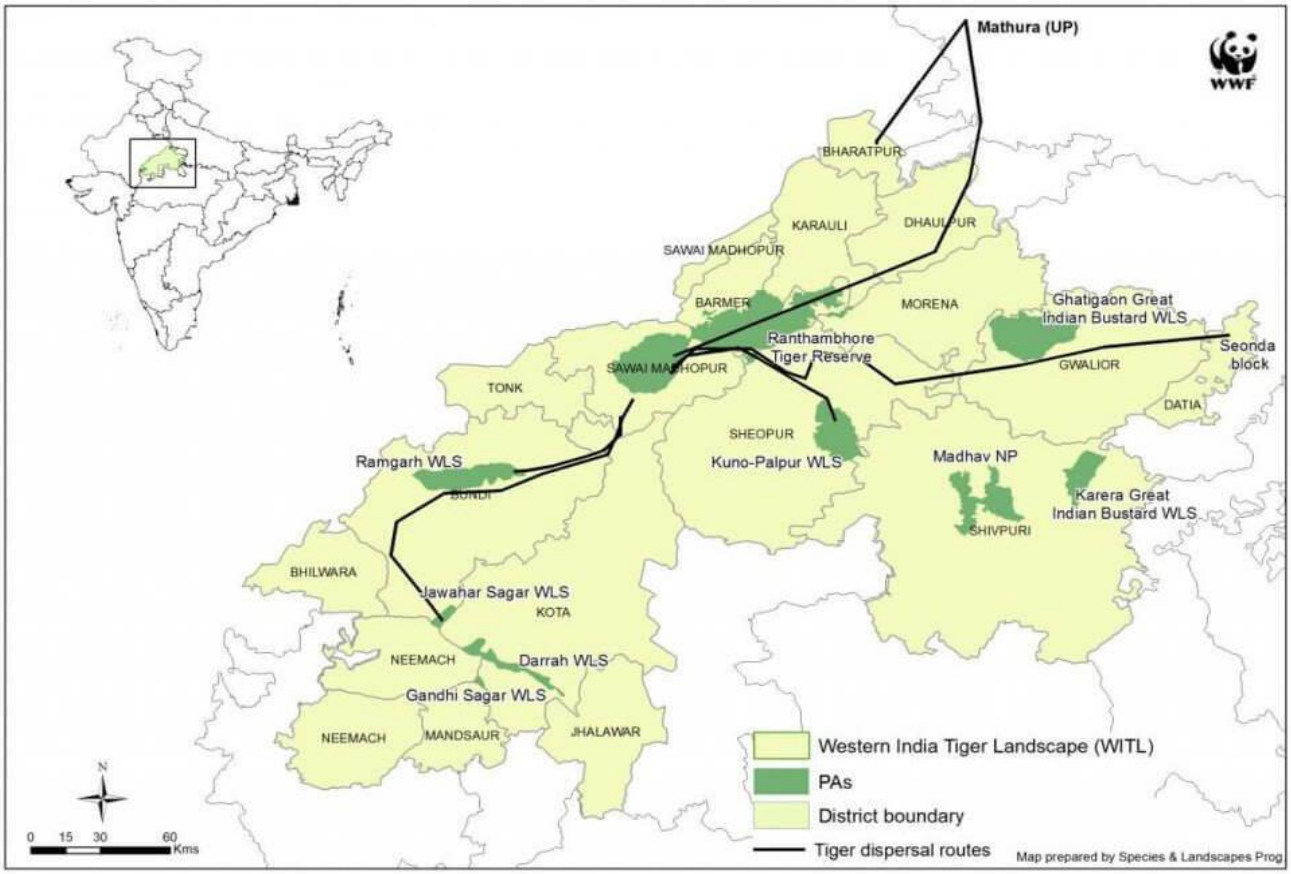
13. Valmiki , Bihar

- West Champaran district
- Royal Chitwan national park of Nepal is contiguous
- River Gandak
- Barking deer, spotted deer, hog deer, sambar, blue bull, spotted hyena, leopard cat, wild cat, fishing cat, flying squirrel, clouded leopard, Indian gaur, Mongoose

14. Palamu TR, Jharkhand

- Betla NP and Palamu WS
- Naxal affected
- One among the original 9 tiger reserves
    - **North Koel river**



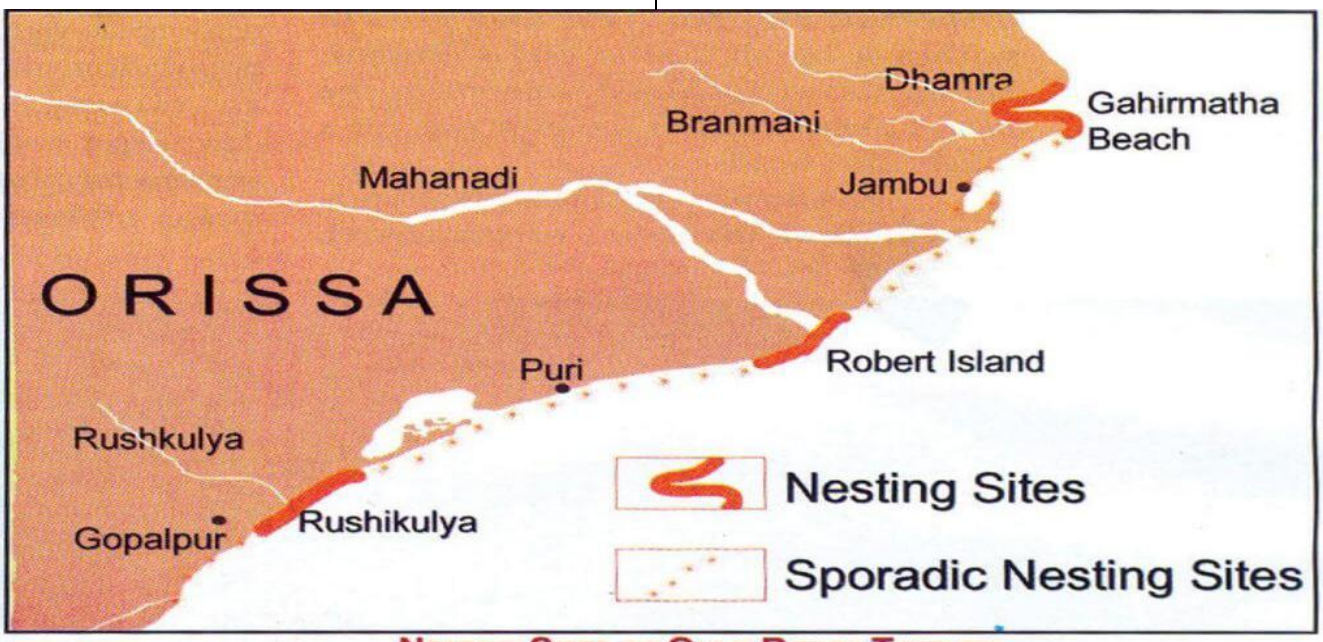


53. Guru Ghasidas TR, Chhattisgarh

- National Tiger Conservation Authority (NTCA) has designated the combined areas of the Guru Ghasidas National Park (Sanjay National Park) and Tamor Pingla Wildlife Sanctuary as a Tiger Reserve.
- It is located in the northern part of Chhattisgarh, bordering Madhya Pradesh and Jharkhand.
- This will be the fourth Tiger Reserve in Chhattisgarh, after the Udanti-Sitanadi, Achanakmar, and Indravati Reserves.
- Guru Ghasidas National Park was the last known habitat of the Asiatic cheetah in the country.
- It connects Jharkhand and Madhya Pradesh and provides a corridor for tigers to move between the Bandhavgarh (Madhya Pradesh) and Palamau Tiger Reserves (Jharkhand).
- **Flora**: The vegetation consists mainly of mixed deciduous forest with teak, sal and bamboo trees.
- **Fauna**: Tiger, Leopard, Chital, Nilgai, Chinkara, Jackal, Sambar, Four-horned Antelope etc.
- Tamor Pingla Wildlife Sanctuary
- It is located in the Surajpur district of Chhattisgarh bordering Uttar Pradesh. It is named after Tamor hill and Pingla Nalla.
- Tamor hill and Pingla Nalla are considered to be the old and prominent features of the sanctuary area.
- Mixed deciduous forests dominate the sanctuary. Sal and bamboo forests are seen all through.

- Loggerhead turtle
- Leatherback turtle

- Except, the Loggerhead, the remaining four species nest along the Indian coast.



NESTING SITES OF OLIVE RIDLEY TURTLES

Indian Forest Act 1927 –

The Indian Forest Act, 1927 was largely based on previous Indian Forest Acts implemented under the British. The most famous one was the Indian Forest Act of 1878. Both the 1878 act and the 1927 act sought to consolidate and reserve the areas having forest cover, or significant wildlife, to regulate movement and transit of forest produce, and the duty leviable on timber and other forest produce.

It also defines the procedure to be followed for declaring an area to be a Reserved Forest, a Protected Forest, or a Village Forest. It defines what is a forest offence, what are the acts prohibited inside a Reserved Forest, and penalties leviable on violation of the provisions of the Act.

Definition of forest

- **ECOLOGICAL** – Area dominated by trees
- **LEGAL** – Area notified under the Forest Act, 1927
- **SURVEY** – Area of more than 1-hectare having canopy density of more than 10 percent
- **JUDICIAL** – Godavarman Case
- The Supreme Court judgment expanded the definition of the forest to include lands that were already notified by the Centre as forests, that appear in government records as forests as well as those that fell in the "dictionary definition" of the forest.

Background

- Indian Forest Act of 1865: The Imperial Forest Department, set up in 1864, attempted to establish British control over forests, by various legislations
- It empowered the British government to declare any land covered with trees as a government forest and make rules to manage it.
- Indian Forest Act of 1878: By the Forest Act of 1878, the British Administration acquired the sovereignty of all wastelands which by definition included forests.

- This Act also enabled the administration to demarcate reserved and protected forests. The local rights were refused in the case of protected forests while some privileges which were given to the local people by the government which can be taken away are anytime.
- This Act classified the forests into three – reserved forests, protected forests and village forests. It attempted to regulate the collection of forest produced by forest dwellers and some activities declared as offences and imprisonment and fines were imposed in this policy to establish state control over forests.

Indian Forest Act 1927

This Act impacted the life of forest-dependent communities. The penalties and procedures given in this Act aimed to extend the state's control over forests as well as diminishing the status of people's rights to forest use.

- The village communities were alienated from their age-old symbiotic association with forests. Further amendments were also made to restrain the local use of forests mainly by forest-dependent communities.
- It was enacted to make forest laws more effective and to improve the previous forest laws.

Objective

- To consolidate all the previous laws regarding forests.
- To give the Government the power to create different classes of forests for their effective usage for the colonial purpose.
- To regulate movement and transit of forest produce, and duty leviable on timber and other forest produce.
- To define the procedure to be followed for declaring an area as Reserved Forest, Protected Forest, or Village Forest.
- To define forest offenses acts prohibited inside the Reserved Forest, and penalties leviable on the violation.
- To make conservation of forests and wildlife more accountable.

Features

- Notification of forests in India is done under this act.
- The act also categorises forests in 3 types-
- Reserved Forest – Every activity is prohibited unless permitted.
- Protected Forest – Every activity is permitted unless prohibited.
- Village Forest – Very less restriction is there.
- The act has punishment for trade in timer, encroachment, etc.
- The act prescribes the creation of a state forest department to look after the forests.

Types of Forests

- **Reserved Forests**: Reserve forests are the most restricted forests and are constituted by the State Government on any forest land or wasteland which is the property of the Government.
- In reserved forests, local people are prohibited, unless specifically allowed by a Forest Officer in the course of the settlement.

- **Protected Forests:** The State Government is empowered to constitute any land other than reserved forests as protected forests over which the Government has proprietary rights and the power to issue rules regarding the use of such forests.

- This power has been used to establish State control over trees, whose timber, fruit or other non-wood products have revenue-raising potential.

- **Village forest:** Village forests are the ones in which the State Government may assign to 'any village community the rights of Government to or over any land which has been constituted a reserved forest'.

Degree of protection

- **Reserved forests > Protected forests > Village forests**

Drawbacks

- The government claimed that the act was aimed to protect the vegetation cover of India. However, a deep investigation of the act reveals that the real motive behind the act was to earn revenue from the cutting of the trees and from the forest produce.
- The act gave immense discretion and power to the forest bureaucracy which often led to the harassment of the forest dwellers.
- Moreover, it led to depriving the nomads and tribal people of their age-old rights and privileges to use the forests and forest produce.
- The revenue earning potential from timber overshadowed the other values like biodiversity, prevention of soil erosion, etc.

Criticism

- Forests were notified but tribal rights were not recognised. This made tribal unlawful settlers in the forest. This was the historic wrong done by the act. Finally, the historic wrong was corrected by the Forest Rights Act, 2006.

Current Issue

- Recently an amendment was made to declare bamboo as a minor forest produce only in non-forest areas.

Later Initiatives

- **Indian Forest Policy, 1952:** The Indian Forest Policy, 1952 was a simple extension of colonial forest policy. However, it became conscious about the need to increase the forest cover to one-third of the total land area.
- At that time maximum annual revenue from forests is a vital national need. The two World Wars, the need for defense, developmental projects such as river valley projects, industries like pulp, paper, and plywood, and communication heavily depended on forest produce for national interest. As a result, huge areas of forests were cleared to raise revenue for the State.

- **Forest Conservation Act, 1980:** The Forest Conservation Act, 1980 stipulated that central permission is necessary to practice sustainable agro-forestry in forest areas. Violation or lack of permit was treated as a criminal offense.
- It is targeted to limit deforestation, conserve biodiversity, and save wildlife. Though this Act provides greater hope towards forest conservation it was not successful in its target.

- **National Forest Policy, 1988:** The ultimate objective of the National Forest policy was to maintain environmental stability and ecological balance through the conservation of forests as a natural heritage.
- The National Forest Policy in 1988 made a very significant and categorical shift from commercial concerns to focus on

made on the biological resources obtained from India.

The act envisaged a three-tier structure to regulate the access to biological resources:

- **The National Biodiversity Authority (NBA)**
- **The State Biodiversity Boards (SBBs)**
- **The Biodiversity Management Committees (BMCs) (at the local level)**
- The Act provides these authorities with special funds and a separate budget in order to carry out any research project dealing with the biological natural resources of the country.
- It shall supervise any use of biological resources and the sustainable use of them and shall take control over the financial investments and their return and dispose of those capitals as correct.
- Under this act, the Central Government in consultation with the NBA:
- Shall notify threatened species and prohibit or regulate their collection, rehabilitation, and conservation
- Designate institutions as repositories for different categories of biological resources.
- The act stipulates all offenses under it as cognizable and non-bailable.
- Any grievances related to the determination of benefit sharing or order of the National Biodiversity Authority or a State Biodiversity Board under this Act shall be taken to the National Green Tribunal (NGT).

The other laws that NGT deals with, include:

- **The Water (Prevention and Control of Pollution) Act, 1974,**
- **The Water (Prevention and Control of Pollution) Cess Act, 1977,**
- **The Forest (Conservation) Act, 1980,**
- **The Air (Prevention and Control of Pollution) Act, 1981,**
- **The Environment (Protection) Act, 1986,**
- **The Public Liability Insurance Act, 1991.**

The Government can declare Biodiversity Heritage Sites under the act.

- **Ameenpur lake of Telangana is the first such site.**

Exemptions from the Act:

- The Act excludes Indian biological resources that are normally traded as commodities.
- Such exemption holds only so far the biological resources are used as commodities and for no other purpose.
- The act also excludes traditional uses of Indian biological resources and associated knowledge and when they are used in collaborative research projects between Indian and foreign institutions with the approval of the central government.
- Uses by cultivators and breeds, e.g. farmers, livestock keepers, and beekeepers, and traditional healers e.g.vaids and hakims are also exempted.
- **The National Biodiversity Authority**
- **The National Biodiversity Authority (NBA) was established in 2003 by the Central Government to implement India's Biological Diversity Act (2002).**
- It is a Statutory body that performs facilitative, regulatory, and advisory functions for the Government of India on the issue of Conservation and sustainable use of biological resources.
- **The NBA has its Headquarters in Chennai, Tamil Nadu, India.**

- *Foreigners doing research on the biological resources of India need the permission of the National Biodiversity Authority.*
- *There is mention of the National Biodiversity Fund for the implementation of the act.*

Structure of the NBA:

- *The National Biodiversity Authority consists of the following members to be appointed by the central government, namely:*
- ***A Chairperson.***
- ***Three ex officio members, one representing the Ministry dealing with Tribal Affairs and two representing the Ministry dealing with Environment and Forests.***
- ***Seven ex-officio members to represent respectively the Ministries of the Central Government dealing with:***
- ***Agricultural Research and Education***
- ***Biotechnology***
- ***Ocean Development***
- ***Agriculture and Cooperation***
- ***Indian Systems of Medicine and Homoeopathy***
- ***Science and Technology***
- ***Scientific and Industrial Research;***
- ***Five non-official members to be appointed from amongst specialists and scientists having special knowledge and experience in the required matters.***

Functions of the NBA:

- *Creating an enabling environment, as appropriate, to promote conservation and sustainable use of biodiversity.*
- *Advising the central government, regulating activities and issuing guidelines for access to biological resources and for fair and equitable benefit sharing in accordance with the* ***Biological Diversity Act, 2002****.*
- *Taking necessary measures to oppose the grant of intellectual property rights in any country outside India on any biological resource obtained from India or knowledge associated with such biological resources derived from India illegally.*
- *Advising the State Governments in the selection of areas of biodiversity importance to be notified as heritage sites and suggest measures for their management.*

State Biodiversity Boards (SBBs):

- *The SBBs are established by the State Governments in accordance with* ***Section 22 of the Act.***
- ***Structure****: The State Biodiversity Board consists of the following members:*
- ***A Chairperson***
- ***Not more than five ex officio members to represent the concerned Departments of the State Government***
- ***Not more than five members from amongst experts in matters relating to conservation of biological diversity, sustainable use of biological resources and equitable sharing of benefits arising out of the use of biological resources.***
- ***All the members of the SBB are appointed by the respective State Governments.***

Functions of SBBs:

- *Advise the State Government, subject to any guidelines issued by the Central Government, on matters relating to the conservation, sustainable use, or sharing equitable benefits.*
- *Regulate by granting approvals or otherwise requests for commercial utilization or bio-survey and bio-utilization of any biological resource by people.*

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EXAM (परीक्षा)	EXAM DATE	हमारे नोट्स में से आये हुए प्रश्न
RAS PRE. 2021	27 अक्तूबर 2021	74 प्रश्न (150 में से) CUT OFF – 64
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SSC GD 2021	01 दिसम्बर	65 (100 में से)
SSC GD 2021	08 दिसम्बर	67 (100 में से)
राजस्थान S.I. 2021	13 सितम्बर	113 (200 में से)
राजस्थान S.I. 2021	14 सितम्बर	119 (200 में से)

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5. These notes contain the view of articles and editorials daily explained in **The Hindu and Indian Express.**

What These Notes Contains:

1. Complete syllabus of **UPSC – CSE (IAS) Pre. And Mains** and key points that are important on the basis of **Previous year question papers** – Topic-wise segregated questions of past 30 years.
1. We **highlighted and briefly explain** the important topics which asked in **Previous year question papers.**
2. **Flowcharts, Maps, and Infographics available in these notes** helps in picturizing the concept in a precise manner, and makes it easy to remember.
3. **These notes have Static + Current Coverage data. It** Links the current articles with the related static content of all GS papers .
4. All notes are handwritten and clearly explained.
5. We also mention some **tricks and tips** that helps you in quick learning.
6. We only mention **the content** that is important according to exam point of view.

How these notes helps you in your success:-

1. Notes are **completely prepared by experts and UPSC CSE toppers** in a very **convenient language** that you can easily understand and

you don't need any coaching and other market books, like this your **lakhs of money** which you spent on coaching centres can be saved.

2. All material is completed on the basis of **last years question papers and topics** which helps you to save your time from reading extra data and different types of books available in market.
3. These notes are prepared in a way that if any student does not clear the exam for any reason, then these notes will also help them for any other exam similar to this syllabus like **UPPSC, MPPSC, RAS etc.**
4. These notes are created in a way that every student can easily read them, **like weak, medium or intelligent students.**

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