



CLASS: XII	DEPARTMENT: SCIENCE (2024-25) SUBJECT: BIOLOGY	DATE: 30/10/2024
WORKSHEET NO: 12 WITH ANSWERS	UNIT: ECOLOGY (BIODIVERSITY AND CONSERVATION)	NOTE: A4 FILE FORMAT
CLASS & SEC:	NAME OF THE STUDENT:	ROLL NO.

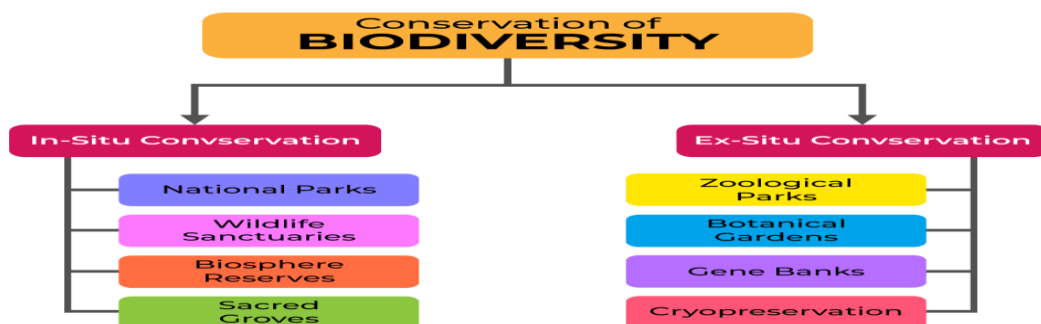
CASE STUDY

1. The term 'biodiversity hotspot' was first introduced in the late 1980s by Norman Myers as 'specific areas on earth's land surface harboring disproportionately large numbers of extinct species'. At first, a list of 18 biodiversity hotspots was identified based on the richness of higher plant species. Later new areas were included, and the list of biodiversity hotspots was increased to 25.

The Western Ghats are one of the first 18 globally identified biodiversity-rich hotspots. The mountain range is believed to be older than the Himalayas and spreads across six western states of India, in Gujarat, Maharashtra, Goa, Karnataka, Tamil Nadu, and Kerala. Among these six states, Maharashtra is the most urbanized and industrialized region making it vital to create a locale-specific viable management strategy for this ecologically sensitive area.

- Explain the term 'biodiversity hotspot' (1)
- Hotspots are included in which type of conservation programme. (1)
- Briefly explain the above conservation programme with any two examples. (2)

2. Given below are the two most important conservation programmes followed to preserve our Biodiversity. Study the different techniques used under the two main categories of conservation programme.



- a) How is Ex-Situ conservation different from In-Situ conservation. (1)
- b) What are Sacred Groves, name any one Sacred Grove of India. (1)
- c) Explain how Cryopreservation technique used in Ex-Situ programme. (2)

3. Biodiversity plays a major role in many ecosystem services that nature provides. The fast-dwindling Amazon forest is estimated to produce, through photosynthesis, 20 per cent of the total oxygen in the earth's atmosphere. Pollination without which plants cannot give us fruits or seeds is another service, ecosystems provide through pollinators layer – bees, bumblebees, birds and bats.

There are other intangible benefits – that we derive from nature—the aesthetic pleasures of walking through thick woods, watching spring flowers in full bloom or waking up to a bulbul's song in the morning. The ethical argument for conserving biodiversity relates to what we owe to millions of plant, animal and microbe species with whom we share this planet. Philosophically or spiritually, we need to realise that every species has an intrinsic value, even if it may not be of current or any economic value to us.

We have a moral duty to care for their well-being and pass on our biological legacy in good order to future generations

- a) According to which utilitarian, do humans derive numerous direct economic benefits from nature? (1)

i) Big utilitarian

ii) Broadly utilitarian

iii) Narrowly utilitarian

iv) Small utilitarian

- b) From the passage identify any two intangible benefits we derive from nature. (1)
- c). What are the ethical reasons for conserving biodiversity according to our case study. (2)

MCQs (One-mark questions)

1. Threatened animals and plants are placed in a separate care unit for protection. It is called ____

- a) Ex-situ conservation
- b) In situ conservation
- c) Wildlife sanctuary
- d) National park

2. Chipko Movement was strengthened under the leadership of

- a) Amrita Devi Bishnoi

b) Medha Patkar

c) A. K. Banerjee

d) Sunder Lal Bahuguna

3. What is the term for studying molecular, genetic, and species-level diversity for economically important products?

a) Biopiracy

b) Biofuel

c) Bioprospecting

d) Biodiversity

4. An ex-situ conservation method for endangered species is –

a) Wildlife Sanctuaries

b) Cryopreservation

c) National Parks

d) Biosphere reserves

5. The highest number of species in the world is represented through

a) Fungi

b) Algae

c) Lichens

d) Mosses

Two-mark questions

1. The Amazon rain forest is referred to as 'the lungs of the planet'. Mention any one human activity which causes loss of biodiversity in this region.

2. About 20 species of a Cichlid fish became extinct when a particular fish was introduced in Lake Victoria of Africa. Name the invasive fish.

3. Why is genetic variation important in the plant *Rauwolfia vomitoria*?

4. What is meant by 'alien species' invasion? Name one plant and one animal alien species that are threat to our Indian native species.

5. What is eutrophication? Explain with an example.

Three-mark questions

1. Why should biodiversity be conserved? List any two ethical arguments in this support.
2. What are the two types of desirable approaches to conserve biodiversity? Explain with examples bringing out the difference between the two types.
3. Explain taking one example, the effect of co-extinction on biodiversity?
4. In the biosphere, immense biological diversity exists at all levels of biological organization. Explain any two levels of biodiversity?
5. The sacred grooves of Aravalli hills and Ooty botanical garden, both aim at biodiversity conservation. How do they differ in their approaches? Explain.
6. Taking one example each of habitat loss and fragmentation, explain how the two are responsible for biodiversity loss.
7. White Bengal tigers are protected in special settings in zoological parks. Tiger reserves are maintained in Western Ghats.
 - a) How do these two approaches differ from each other? Mention the advantages of each one.
 - b) What is the significance of cryopreservation technique?

Five-mark questions

- 1.a) Which type of graph curve is obtained when species richness is plotted against area? Draw the graph.
 b) Identify the equation and state each component of the equation.
- 2.a) Categorize the following into in-situ and ex-situ approaches of biodiversity conservation.
 i) Botanical gardens ii) Wild life sanctuaries iii) Gene bank iv) Biosphere reserves v) Sacred forests/lakes vi) Pollen banks vii) Tissue culture viii) Cryo-preservation
 b) Differentiate between in-situ and ex-situ approaches of biodiversity conservation.
- 3.a) If a species of fish becomes extinct, all those parasites, specific to that fish also face extinction. Which of the major cause describe as —the evil Quartet ‘s is being accounted?
 b) Categorize the followings statement into narrowly utilitarian, broadly utilitarian and ethical reason: -
 i) Every species in biodiversity has an intrinsic value even if it not of value to us.
 ii) Human beings’ derive a number of economic benefits like food, fiber etc from biodiversity.
 iii) Biodiversity provides ecosystem services which cannot be given price tag. Justify your categorization also

Previous Board questions

1. What is hot spot. Give two examples. (2)
2. Western Ghats have greater amphibian species diversity than Eastern Ghats. Why? (1)
3. Explain bio magnification of DDT in an aquatic food chain. How does it affect the bird population? (3)
4. List the reasons that account for the greater biological diversity in tropics? (3)

5. Write the importance of cryopreservation in conservation of biodiversity. (2)
6. Mention one application of pollen bank. How are pollen stored in a bank? (2)
7. Biodiversity must be conserved as it plays an important role in many ecosystem services that nature provides. Explain any two services of the ecosystem. (2)
8. Why certain region have been declared as biodiversity hot spots by environmentalists of the world? Name any two hot spot regions of India. (2)
9. (i) Why is there a need to conserve biodiversity
- (ii) Name and explain any two ways that are responsible for the loss of biodiversity. (5)

Some Hints

MCQs

1-b	2-d	3-c	4-b	5-a
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7	White Bengal tigers are protected in special settings in zoological parks. This is called ex situ conservation, while tiger reserves are maintained in Western Ghats. This is called in situ. (i) differences between two approaches, i.e. in situ conservation and ex situ conservation and their advantages. (ii) Using cryopreservation technique: - Gametes of threatened species can be preserved in viable and fertile conditions for long. - Plants are propagated by tissue culture method. - Eggs can be fertilised in vitro.	3
8	Certain regions are declared hot spots by the environmentalists because these regions have very high levels of species richness and high degree of endemism. Hot spots of India are Western Ghats and Sri Lanka, Himalayas and Indo-Burma	2
9	The biodiversity needs to be conserved because of three categories: Narrow unitarian includes most of the resources required for our day-to-day life, e.g. food, oil, clothes, firewood, drugs and medicines, industrial products all are derived from nature, thus needs to be conserved to reap more benefits. Broadly unitarian includes most of the ecosystem services provided to us by nature. Such as release of oxygen and fixation of CO₂ by photosynthesis	5

	in plants, pollination and dispersal of seeds, etc. Therefore, for the continuation of these services' biodiversity needs to be conserved. Ethical reasons as it becomes our moral duty to take care of all living species in our surroundings irrespective of their economic importance and pass this biological legacy to our future generations The two ways that are responsible for the loss of biodiversity are: • Habitat loss and fragmentation of natural habitats due to the natural reasons or human activities and pollution results in degradation of habitats, thereby threatening the survival of many species concerned. • Co-extinction also leads to loss of biodiversity as when a species becomes extinct, the plant and animal species associated with it in obligatory way also become extinct, e.g. when a host organism (fish) becomes extinct, the parasites exclusive to it also becomes extinct	
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