3.4 Conservation of Biodiversity

**Significant ideas:**

The impact of losing biodiversity drives conservation efforts.

The variety of arguments given for the conservation of biodiversity will depend on environmental value systems.

There are various approaches to the conservation of biodiversity, with associated strengths and limitations.
Reasons for Species and Habitat Preservation

1. A number of reasons to preserve biodiversity are listed below. Outline each one. For each one circle the appropriate word(s) to state whether this is an aesthetic, ecological, economic, ethical or social reason to preserve biodiversity. Each one may fall into one or multiple categories

**Food sources (Aesthetic Ecological Economic Ethical Social)**
- Need to preserve a variety of food sources. Pests & disease may wipe out strains currently used as food.

**Ecological services (Aesthetic Ecological Economic Ethical Social)**
- Preservation of as many species and as much natural or semi-natural habitats as possible may render the environment more stable.

**Economic Value (Aesthetic Ecological Economic Ethical Social)**
- Many of the materials we use each day, other than food or medicine, are natural products e.g. palm oil, latex.

**Educational Value (Aesthetic Ecological Economic Ethical Social)**
- We investigate and research the diversity of life so we value it. In order to learn about interrelationships of species we need to preserve them.

**Biological control agents (Aesthetic Ecological Economic Ethical Social)**
- Some species of living things help us control invasive species without the use of potentially harmful chemicals.

**Gene Pools (Aesthetic Ecological Economic Ethical Social)**
- Wild animals and plants are sources of genes for hybridization and genetic engineering.

**Future unknown uses (Aesthetic Ecological Economic Ethical Social)**
- Many more unknown practical benefits of biodiversity have yet to be discovered.

**Medicine (Aesthetic Ecological Economic Ethical Social)**
- Many of the medicines used are derived from animals & plants.
- Many medicines may not have been discovered yet.

**Rights of indigenous peoples (Aesthetic Ecological Economic Ethical Social)**
- If biodiversity is protected, indigenous people can continue to live in their native lands.
Recreation (Aesthetic Ecological Economic Ethical Social)

Many people take vacations in areas of natural beauty and national parks which brings extra income to the area.

Ecotourism (Aesthetic Ecological Economic Ethical Social)

Biodiversity is often the subject of aesthetic interest. People rely on wild places and living things in them for spiritual fulfillment.

Biorights (Aesthetic Ecological Economic Ethical Social)

Biologically diverse ecosystems help to preserve their component species reducing the need for future conservation efforts on single species.
1. a) What do the following acronyms stand for?

**IGO**
- Intergovernmental Organizations e.g. European Environment Agency (EEA)

**GO**
- Governmental Organization e.g. Environmental Protection Agency, USA (EPA)

**NGO**
- Non-governmental organization e.g. Greenpeace

b) Compare and contract the above types of organisation. Include examples of each one in your answer.

IGO's tend to be more conservative (i.e. have a more conventional approach to conservation and are not likely to be controversial) whereas NGOs tend to be more radical. NGOs also tend to be well-funded, gathering information to back up their arguments, whereas IGOS tend to gather information from scientific research, which they pay for. E.g. UNEP works with direct links to governments of many countries. WWF influence is indirect and depends on lobbying, pressure groups, public protest.
2. IGOs, GOs and NGOs are all involved in conservation. List and explain that factors affect how successful they are in ecosystem conservation and restoration.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Explanation</th>
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<tbody>
<tr>
<td>use of media</td>
<td>IGO work with media so communicates its policies and decisions effectively to public. NGOs gain media coverage less directly.</td>
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<tr>
<td>speed of response</td>
<td>NGO faster to respond, members have reached a consensus. IGO slower to respond due to bureaucracy and government involvement.</td>
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<tr>
<td>political pressure</td>
<td>IGO decisions can be politically (and economically driven) rather than by best conservation strategy with NGOs.</td>
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<tr>
<td>public image</td>
<td>NGOs can be seen as confrontational and radical compared to more scientific and business-like approach of IGOs.</td>
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<tr>
<td>Funding</td>
<td>IGOs fund projects with national budget whereas NGOs tend to use private donations.</td>
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3. Outline the role that the United Nations (UN) has had on biodiversity conservation.

International cooperation was formalized with the UN. UNEP set up an intergovernmental panel on climate change and chose the Montreal Protocol for phasing out CFC production.

4. The World Conservation Strategy (WCS), published in 1980, was pivotal in its impacts on the conservation effort.

a) List the organisations involved (don’t use acronyms)
   - International Union for the Conservation of Nature (IUCN)
   - United Nations Environment Programme (UNEP)
   - World Wide Fund for Nature (WWF)

b) List the aims of the World Conservation Strategy.
   - Maintain essential ecological processes and life support systems.
   - Preserve genetic diversity.
   - Ensure the sustainable utilization of species and ecosystems.
5. In the space below draw a timeline showing major milestones in international cooperation in protecting biodiversity. (Draw it landscape if you want to).

1961 - World Wildlife Fund set up by IUCN + Julian Huxley

1966 - Species Survival Commission published Red Data Lists


1980 - World Conservation Strategy

1982 - Bruntland Commission published -beginnings of sustainable development

1987 - Brundtland Commission on our common future - first defined

1991 - Caring for the Earth: A Strategy for sustainable living

1992 - Earth Summit, Rio de Janeiro produced Agenda 21, Convention on Biological Diversity (CBD) and the Rio Declaration leading to BAPs (biodiversity action plans)
Earth Council Global Biodiversity Strategy

2000 - UN Millenium Summit and the Millenium Development Goals (MDG)

2002 - World Summit on sustainable development held in Johannesburg

2005 - World Summit, New York

2010 - International Year of Biodiversity

2012 - Rio +20 - UN conference on sustainable development (UNSD)
## Approaches to conservation

1. Conservation methods may involve habitat conservation or species conservation (and often a mixture of both).

Outline what is meant by the terms:

### Species Conservation

These strategies focus on conserving the species but does not look at conserving the habitat in which it lives.

### Habitat Conservation

These strategies focus on the conservation of a habitat so the species within their habitat can survive.

2.

a) What does CITES stand for?

**Convention on International Trade in Endangered Species (CITES)**

b) Outline the aim of CITES.

To ensure that the international trade in specimens of wild animals and plants does not threaten their survival.

c) Species are grouped by CITES into three appendices. State the criteria for these:

**Appendix I**

Species cannot be traded internationally as they are threatened by extinction.

**Appendix II**

Species can be traded internationally but within strict regulations ensuring its sustainability.

**Appendix III**

A species included at the request of a country which then needs the cooperation of other countries to help prevent illegal exploitation.
3. Captive breeding facilities include zoos and aquaria as well as other specialised facilities.
   a) Outline what the term "captive breeding programme" means.
      Species that are bred, or their DNA kept, in captivity.
      Involves zoos and aquaria.
   b) Using the subheadings as a guide, evaluate the use of captive breeding programs.

   **Examples of success stories**
   - California condor
   - Przewalski’s horse in Mongolia
   - Black-footed ferret in Wyoming, USA.

   **Difficulties in re-introduction to a habitat**
   - Animals may have become used to humans e.g. orang utans have to be taught how to climb & socialise with each other.
   - Plants may be dug up by collectors, outcompeted by other plants or eaten by herbivores.

   **Ethical objections to zoos**
   - Sometimes animals are kept in close confinement in small cages or treated with cruelty. Large animals may be kept no this is what the public wants.

   **Financial cost**
   - Captive breeding programmes are expensive and projects need to be considered long-term.

4. Summarise the function of seed banks
   - Where seeds, frozen or dry, are stored. A way of preserving the genetic variation of a species should they be lost in the wild. With crops the seeds can represent many more varieties of current species.
5.

a) State what is meant by “flagship species”. Include examples

These are species that are charismatic, instantly recognizable, popular and can capture our imagination e.g. giant panda

b) Evaluate the use of flagship species for conservation. Use the subheadings as a guide.

**Instant appeal**

These species are charismatic, instantly recognizable, popular. Their appeal means they can be used to ask for funds from the public e.g giant panda

**“Umbrella” effects**

The flagship species greatly help the other species in the same habitat: those under its umbrella e.g lemurs of Madagascar

**Prioritizing species**

These flagship species can take priority over more ecologically significant species

**Dangerous animals**

Flagship species such as the Bengal tiger and the Asian elephant may come into conflict with humans either through their predatory behaviour or habitat destruction.

6.

a) What is meant by the term “keystone species”?

Keystone species are species that are vital for the continuing function of the ecosystem. Their disappearance can have an impact far greater than and not proportional to their numbers or biomass e.g. sea otters