

Human influences on ecosystems revision notes

Humans change ecosystems when they build, farm and extract resources. This topic looks at biodiversity, why habitats are destroyed, the effects of deforestation, and why species become endangered and how they are conserved.

For Cambridge IGCSE Combined Science 0653, **Supplement** is Extended content, only examined on Papers 2 and 4.

1 Habitat destruction Spec B16.1

Biodiversity and habitat destruction Spec B16.1.2, B16.1.3

Biodiversity	The number of different species that live in an area.
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A habitat is destroyed when it is changed so much that the organisms living there can no longer survive. This reduces **biodiversity**.

Reasons for habitat destruction

- **Increased area for housing, crop plant production and livestock production:** forests, grassland and wetlands are cleared to build homes and to grow food for a growing population.
- **Extraction of natural resources:** mining, quarrying and drilling remove soil and rock and destroy the habitat above.
- **Freshwater and marine pollution:** pollutants such as sewage, fertiliser and plastics make water unsuitable for the organisms that live in it.

Exam tip: Biodiversity is about the number of different species, not the number of individual organisms.

Deforestation Spec B16.1.4, B16.1.5

Deforestation is the removal of forests on a large scale. Forests are cleared for timber, for farmland (crops and cattle), for housing and for roads and mining.

You need to be able to state the five undesirable effects of deforestation:

- reduced biodiversity
- extinction
- loss of soil
- flooding
- an increase of carbon dioxide in the atmosphere

Supplement

Undesirable effects of deforestation

Effect	Explanation
Reduced biodiversity	Trees provide food and shelter, so many species lose their habitat and food source
Extinction	If a species lives only in that forest and cannot move elsewhere, the whole species can die out
Loss of soil	Tree roots hold soil together; without them rain washes the soil away (soil erosion)
Flooding	Tree roots absorb water and leaves intercept rain; without trees more water runs straight into rivers
Increase of carbon dioxide in the atmosphere	Fewer trees take in CO ₂ for photosynthesis, and burning or decay of the felled trees releases CO ₂

Supplement

Common mistake: Do not say trees 'make' oxygen as the main problem. The mark is for fewer trees removing less CO₂ from the air by photosynthesis, plus CO₂ released when wood is burned or decays.

Quick check

1. Define biodiversity.
2. Give three reasons for habitat destruction.
3. **Supplement** How does deforestation lead to flooding?
4. **Supplement** How does deforestation increase carbon dioxide in the air?

2 Conservation Spec B16.2

Endangered species and how to conserve them Spec B16.2.1, B16.2.2

An **endangered** species is at risk of dying out. A species is **extinct** when no individuals are left alive anywhere.

Why organisms become endangered or extinct

Causes of endangerment and extinction

Cause	Explanation
Climate change	Habitats change too quickly for species to adapt or move
Habitat destruction	Loss of food, shelter and breeding sites
Hunting	Animals are killed for meat, fur, horns or tusks faster than they reproduce
Overharvesting	Plants or animals are collected or caught faster than they can be replaced
Pollution	Poisons or waste make habitats unsuitable or kill organisms
Introduced species	A non-native species may compete with, prey on or spread disease to native species

Supplement

How endangered species can be conserved

Supplement

- **Monitoring and protecting species and habitats:** populations are counted, and reserves and laws protect the animals and their habitats.
- **Education:** people are taught why species matter, so they support conservation.
- **Captive breeding programmes:** animals are bred in zoos and reserves, and young may be released into the wild.
- **Seed banks:** seeds of rare plants are stored at low temperature so that plants can be grown later if the wild population dies out.

Common mistake: Captive breeding programmes alone do not save a species. The habitat must also be protected so that the animals can be released.

Quick check

1. Give four reasons why species become endangered or extinct.
2. **Supplement** What is a seed bank?

Quick check answers

Habitat destruction

- 1 . The number of different species that live in an area.
- 2 . Housing, crop and livestock production; extraction of natural resources; freshwater and marine pollution.
- 3 . Fewer roots and leaves to absorb water, so more water runs into rivers.
- 4 . Fewer trees photosynthesise, and burning or decay of trees releases CO₂.

Conservation

- 1 . Any four of: climate change, habitat destruction, hunting, overharvesting, pollution, introduced species.
- 2 . A store of seeds from rare plants, kept so that the plants can be grown again if wild populations are lost.