7.3 Biodiversity and human interactions

Name: _____ Class: _____ Date: _____ **Total: 19 marks**

KEY WORDS biodiversity • deforestation • global warming

Objective

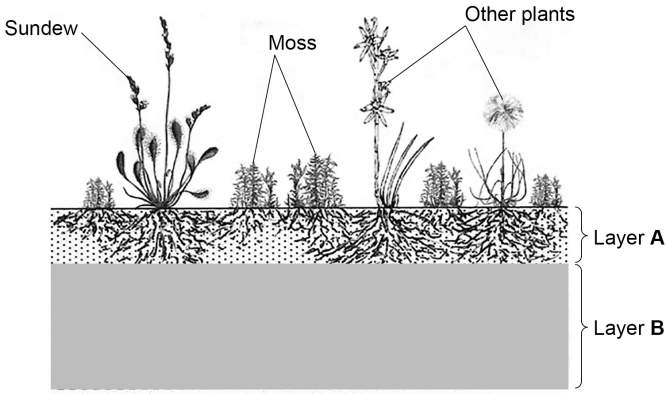
Explain biodiversity, the human threats to it, and the programmes that maintain it. Original questions for spec statement 4.7.3.

1 Key knowledge and worked examples

Biodiversity is the variety of different species on Earth or within an ecosystem, not the total number of organisms. Greater variety can reduce dependence on any one species for food, shelter and maintaining the physical environment. This supports stability but does not guarantee immunity to disturbance.

Population growth and higher living standards increase resource use and waste. Unmanaged waste causes pollution in **water** (sewage, fertiliser, toxic chemicals), **air** (smoke, acidic gases) and **land** (landfill, toxic chemicals). Organisms may die, reducing biodiversity. Building, quarrying, farming and waste disposal remove habitat. Tropical forests are cleared for cattle, rice fields and biofuels: habitat is lost, less carbon dioxide is removed by photosynthesis, and burning/decay releases carbon dioxide. Rising carbon dioxide and methane contribute to warming, changing habitats and species distributions.

Figure 2



Layer **A** contains a lot of air.

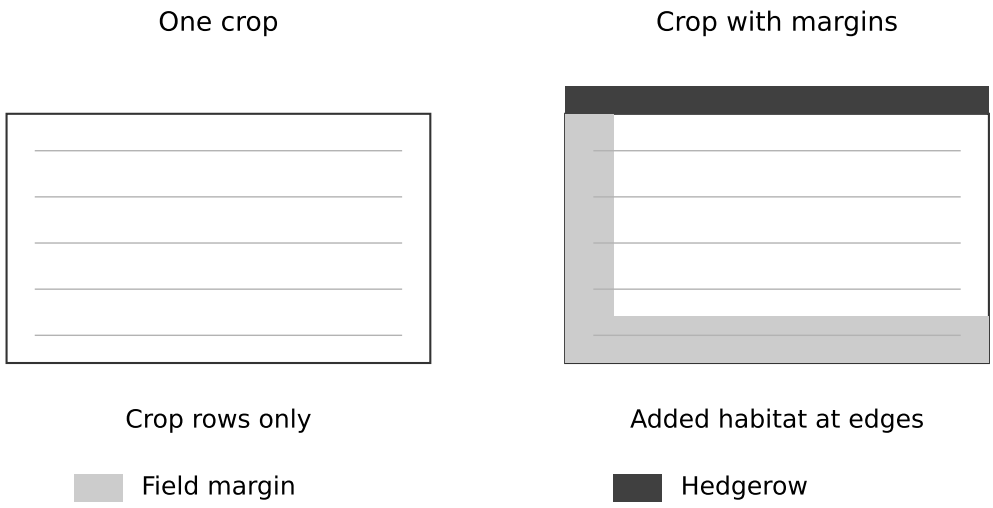
Layer **B**:

- contains the dead remains of plants
- has a low pH
- contains very little oxygen
- contains carbon dioxide and methane.

Peat explanation: little oxygen limits aerobic respiration and energy release in decomposers, slowing decay; low pH can reduce enzyme activity. Removing peat destroys local habitat, food and shelter, causing death or migration. It also releases trapped carbon dioxide and methane; burning peat produces carbon dioxide. Warming can alter rainfall or sea level, destroying habitats elsewhere. These are linked local and global routes, not an automatic claim that every local population loss is worldwide extinction. For original 2025 Q05.3 [6], explain both scales with supporting detail; marks are level based.

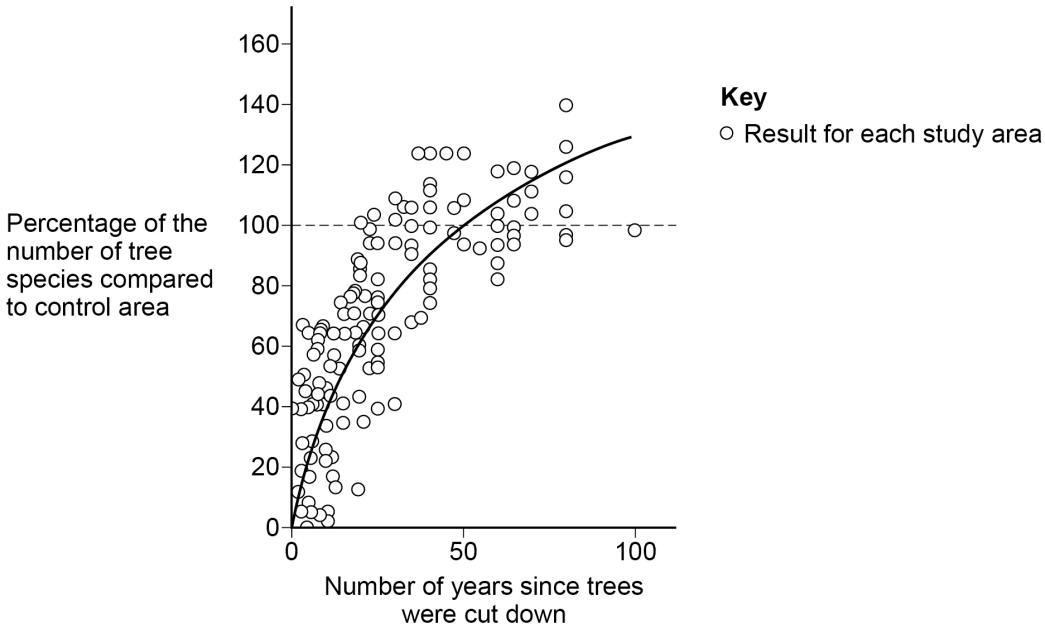
Five programmes: endangered-species breeding; protection/regeneration of rare habitats; field margins and hedgerows; reduced deforestation and carbon dioxide emissions; recycling rather than landfill.

Teacher schematic – not measured species counts.



Hedgerow reasoning: varied plants provide different foods, shelter and nesting sites, potentially supporting more animal species. Connected hedgerows can permit movement between habitats. Benefits depend on management; do not infer a measured increase from this schematic.

Figure 11



Read the evidence: percentages allow comparison when starting numbers of tree species differ. Recovery is initially faster, later slower; variation remains between areas. A 100% species count does not prove the original species composition has returned. More tree species can provide more **types** of food and habitat for animals. When evaluating conservation, weigh given habitat benefits against pressures such as food production, housing and income.

2 Practice

2.1 Define biodiversity. [1]

2.2 Give two reasons why high biodiversity makes an ecosystem stable. [2]

2.3 Name two programmes that maintain biodiversity. [2]

3 Exam-style questions

3.1 Explain how an increase in the human population leads to more pollution, naming where pollution can occur. [5]

3.2 Explain why large-scale deforestation in tropical areas happens and give three environmental consequences. [5]

3.3 Farmers are paid to replant hedgerows around single-crop fields. Explain how this affects biodiversity. [4]