Unit 3: A Level Biology

Deforestation and Overfishing

Deforestation is the removal of trees to use as timber or fuel or to repurpose the land use for agriculture or building.

Consequences:

Soil erosion - soil is no longer protected from rain by the canopy, as roots decompose they no longer hold the soil together so it is eroded by wind and rain.

Flooding - evaporation from soil removes less water than transpiration, waterlogging encourages denitrification and soil loses nitrates.

Habitat loss reduces biodiversity.

Less photosynthesis means that less CO_2 is removed from the atmosphere. CO_2 is a 'greenhouse gas', increased CO_2 leads to global warming and climate change.

Solutions:

Selective felling.

Replanting the correct mix of species, the correct distance apart, and allowing them to regenerate.

Protecting areas.

Overfishing is where fish are caught at a higher rate than they reproduce and grow to the point where increased fishing efforts lead to declining catches.

Consequences:

Fish populations may be reduced in size to the extent that they lose genetic diversity.

Size of fish caught is reduced as they don't have time to grow.

Fish population has fewer individuals and cannot replace harvested fish.

Solutions to overfishing:

Quotas are a maximum mass of fish that can be harvested, heavy fines are imposed for exceeding government set quotas.

Restricted fishing seasons, particularly to allow fish to reproduce.

Exclusion zones preventing fishing in certain areas.

Increased mesh sizes allows smaller fish to escape and grow to breeding size.

Limiting the size of fishing fleets so that not as many fish can be caught.

Fish farming is where fish are intensively reared in ponds/tanks or nets; sea-fish are usually reared in large netted areas of the sea. This is one solution to over-fishing.

Consequences:

☺ Less fish need to be harvested from the wild, allowing fish stocks to replenish.

☺ Fish have been selected for high growth rates and therefore large size and increased yield.

☹ Excess fish food, egesta and excreta fall out of the nets and can cause eutrophication in the marine habitats.

☹ Parasites and diseases spread quickly through the overcrowded fish.

☹ Prophylactic antibiotic use may lead to antibiotic resistance and using pesticides to control parasites will harm marine invertebrates.

☹ If farmed fish escape they could outcompete wild fish or interbreed with them, passing on the alleles for fast growth, pushing wild fish to extinction – some farmed fish have been engineered to be triploid to avoid this issue.

☹ The feed is often made from harvested wild fish.