Biodiversity L80-87

AQA GCSE ECOLOGY PART 2

Food production (biology only)

Factors affecting food security	*Enough food is needed to feed a changing population*
Increasing birth rate.	
Changing diets in developing countries.	
New pests and pathogens affecting farming.	
Environmental changes e.g. famine when rains fail.	
Cost of agriculture input.	
Conflicts (war) affecting water of food availability	

Farming techniques

Increasing efficiency of food production

Reduce energy waste, limiting movement, control temperature, high protein diet to increase growth.

Sustainable fisheries

Fish stocks in oceans are declining

Maintain/grow fish stocks to a sustainable level where breeding continues or certain species may disappear. By controlling net size, fishing quotas.

Some people have concerns about the treatment of animals.

Biotechnology

Meeting the demands of a growing population

Fungus *Fusarium* to produce mycoprotein. Requires glucose syrup, aerobic conditions. Biomass is harvested and purified.

GM bacterium produces insulin to treat diabetes.

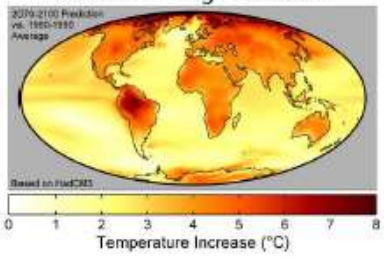
GM crops to provide more/nutritional food (golden rice).

Global warming

Global warming	*Levels of CO_2 and methane in the atmosphere are increasing.*	Decreased land availability from sea level rise, temperature rise damages delicate habitats, extreme weather events harm populations of plants and animals.

There is a global consensus about global warming and climate change based on systematic reviews of thousands of peer reviewed publications.

Global Warming Predictions



Maintaining biodiversity

Human activity can have a positive impact on biodiversity

Scientists and concerned citizens
Put in place programmes to reduce the negative impacts of humans on ecosystems and biodiversity
Breeding programmes for endangered species.
Protection and regeneration of rare habitats.
Reintroduction of field margins and hedgerows in agricultural areas where farmers grow only one type of crop.
Reduction of deforestation and CO_2 emissions by some governments.
Recycling resources rather than dumping waste in landfill.

Some of the programmes potentially conflict with human needs for land use, food production and high living standards.

AQA GCSE ECOLOGY PART 3

Biodiversity and the effect of human interaction on the ecosystem

Biodiversity

Biodiversity is the variety of all different species of organisms on Earth, or within an ecosystem

Maintain a great biodiversity	*Ensures the stability of ecosystems*	By reducing the dependence on one species on another for food, shelter, maintenance of the physical environment.
	Future of human species	Many human activities are reduction biodiversity and only recently measures have been taken to stop it.

Experimental methods are used to determine the distribution and abundance of a species.

Sampling techniques	*Quadrats*	Organisms are counted within a randomly placed square
	Transects	Organisms are counted along a belt (transect) of the ecosystem.

Processing data	
Median	Middle value in a sample.
Mode	Most occurring value in a sample.
Mean	The sum of all the value in a sample divided by the sample number.

Human activity can have a negative impact on biodiversity

Pollution kills plants and animals which can reduce biodiversity.

Waste management	*Rapid growth in human population and higher standard of living*	More resources used and more waste produced.
		Pollution in water; sewage, fertiliser or toxic chemicals.
		Pollution in air; smoke or acidic gases.
		Pollution on land; landfill and toxic chemicals.

Waste, land use and deforestation

Land use
Humans reduce the amount of land and habitats available for other plants, animals and microorganisms.
Building and quarrying.
Farming for animals and food crops.
Dumping waste.
Destruction of peat bogs to produce cheap compost for gardeners/farmers to increase food production.

The decay or burning of peat release CO_2 into the atmosphere.

This conflicts with conserving peat bogs and peatlands as habitats for biodiversity and reduce CO_2 emissions.

Impact of environmental change (Biology HT only)

Large scale deforestation
In tropical areas (e.g. rain forest) has occurred to:
Provide land for cattle and rice fields, grow crops for biofuels.

Deforestation reduces biodiversity and removes a sink for increasing the amount CO_2 in the atmosphere.

Environmental changes affect the distribution of species	*Temperature*	These changes might be seasonal, geographic or caused by human interaction.
	Availability of water	
	Composition of atmospheric gases	

Example: Several species of bird migrate from cold winter conditions to warmer conditions closer to the equator.