**B11 - HUMAN INFLUENCE IN THE ECOSYSTEM**

1. **List the undesirable effects of deforestation (to include extinction, loss of soil, flooding, carbon dioxide build up).**
2. *Species extinction through habitat loss:*

* Reduction of habitats or food sources for animals can result in their extinction;
* Loss of forest habitat also reduces plant & animal diversity & disrupts the food chains.

1. *Loss of soil by soil erosion:*

* Removal of trees means there are no roots to hold soil, thus the thin top layer of soil is washed away during rain;
* This causes soil erosion and leaching of minerals;
* Desertification can eventually result.

1. *Flooding;*

* Soil from erosion is washed into rivers, silting it and causing flooding;
* When forest is removed there are no plant roots to take up rainwater, which instead flows into streams and rivers, causing further flooding.

1. *Carbon dioxide build up:*

* Forests have high rates of photosynthesis so absorb large amounts of carbon dioxide from the atmosphere;
* Removal of forests therefore contributes to increases in atmospheric carbon dioxide.

1. **Describe the undesirable effects of overuse of fertilisers (to include eutrophication of lakes and rivers).**

* To increase crop yields farmers use excess of fertilisers;
* A high concentration of fertilizer around plant roots can cause the roots to lose water by osmosis resulting in the wilting and death of plants;
* Another effect is eutrophication of rivers and lakes as follows:

1. Fertilisers (very soluble) are easily leached out of the soil and washed into rivers and lakes;
2. Algae absorb fertilizer and grow rapidly (algal bloom);
3. Algae form a blanket on the surface of water, blocking sunlight from algae below;
4. Algae and other plants below the surface die without light;
5. Bacteria decompose the dead algae and plants, using up oxygen in the water for respiration;
6. Animals in water die due to lack of oxygen.
7. **Describe the undesirable effects of pollution to include: water pollution by sewage and chemical waste, air pollution by greenhouse gases (carbon dioxide & methane) contributing to global warming.**
8. *Effects of water pollution:*
9. Pollution by chemical waste
10. Pollution by sewage:

* Sewage (urine and faeces) contains high levels of nutrients such as phosphates, organic matter and bacteria;
* Phosphates act as fertilisers for algae, thus resulting in algal bloom;
* Sewage contains organic matter which bacteria break down, causing them to multiply and deoxygenate the water through aerobic respiration;
* Furthermore sewage may contain disease-causing bacteria, which could get into drinking water supplies, causing cholera and typhoid.

1. *Effects of air pollution*:

* Carbon dioxide is produced by burning of fossil fuels;
* Methane is produced from the decay of organic matter and as a waste gas from digestive processes in cattle;
* Carbon dioxide and methane are *greenhouse gases*;
* They are called greenhouse gases as they trap heat in the earth’s atmosphere in the same way a greenhouse traps heat;
* As the concentration of these gases increase in the atmosphere more heat is trapped, making the atmosphere warmer. This is called *enhanced greenhouse effect*;
* It is causing *global warming* –Earth’s average temperature is rising;

1. **Discuss the causes and effects on the environment of acid rain, and the measures that might be taken to reduce its incidence.**

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| *Causes* | *Main sources* | *Effects* | *Possible solutions* |
| Sulphur dioxide, Oxides of nitrogen | Burning of fossil fuels  Combustion of petrol in car engines. | 1. Damage to leaves, killing plants;  2. Acidification of lakes, killing animals;  3. Increased risk of asthma attacks and bronchitis in humans;  4. Corrosion of stonework on buildings;  5. Release of aluminium from the soil into lakes that are toxic to fish. | 1. Changing the power stations from coal and oil to renewable energy sources.  2. Using ‘scrubbers’ in power station chimneys sulphur dioxide.  3. Using catalytic converters in car exhausts to convert oxides of nitrogen to harmless nitrogen. |

1. **Explain how increases in greenhouse gases (carbon dioxide and methane) are thought to cause global warming.**

* Explanation is above (number 3)
* Global warming is causing the following problems:

1. Melt polar ice caps, causing flooding of low-lying land;
2. Change weather conditions in some countries by increasing flooding or reducing rainfall;
3. Cause the extinction of some species that cannot survive at higher temperatures.
4. **Describe the need for conservation of species and their habitats, natural resources (limited to water and non-renewable materials including fossil fuels).**

*Reasons for conserving species include the following:*

* Many species are in the danger of extinction due to habitat destruction, introduction of other species, international trade and pollution;
* Loss of species also means that its genes are lost, these may be important in future for genetic engineering;
* The presence of rare species can be an important source of money for poor communities, through tourism;
* The species may play an important role in a food chain and thus its loss could endanger other species.

*A habitat can be conserved by:*

* Using laws to protect the habitat;
* Using wardens to protect the habitat;
* Reducing or controlling public access to the habitat;
* Controlling factors, such as water drainage and grazing, that may otherwise contribute to destruction of the habitat.

*Conservation of natural resources:*

* Natural resources are non-renewable and therefore need to be conserved in the following ways;

1. By increasing the use of renewable energy (wind energy, solar energy, hydroelectric power);
2. By improving the efficiency of energy use (better insulation, smaller car engines, more public transport);
3. Trees can be grown for fuel, then replanted as they are cut down., in this way the greenhouse effect is not increased and habitats can be maintained.