

CHAPTER # HUMANS AND THE ENVIRONMENT

TOPIC 4: CONSERVATION

SUSTAINABLE RESOURCES

- We use many resources from the Earth; some, such as food, water and wood, are sustainable resources
- A sustainable resource is one which is produced as rapidly as it is removed from the environment so that it does not run out
- Some resources, such as fossil fuels (coal, oil and natural gas), are non renewable because what we use cannot be replaced
- These resources, once used, cannot be produced any more and so they need to be conserved by reducing the amount we use and finding other, sustainable resources to replace them
- Fossil fuels are being used as an energy source in increasing amounts
- In addition, they are the raw materials for many other products we make – eg almost all plastics that are made start with oil as a raw material
- Some products, especially those made from paper, plastic, glass or metal, can be reused and recycled – this reduces waste in the environment and reduces the amounts of raw materials and energy needed to make new products
- Some resources, such as forests and fish stocks, can be maintained – enabling us to harvest them sustainably so that they will not run out in the future

SUSTAINABLE DEVELOPMENT

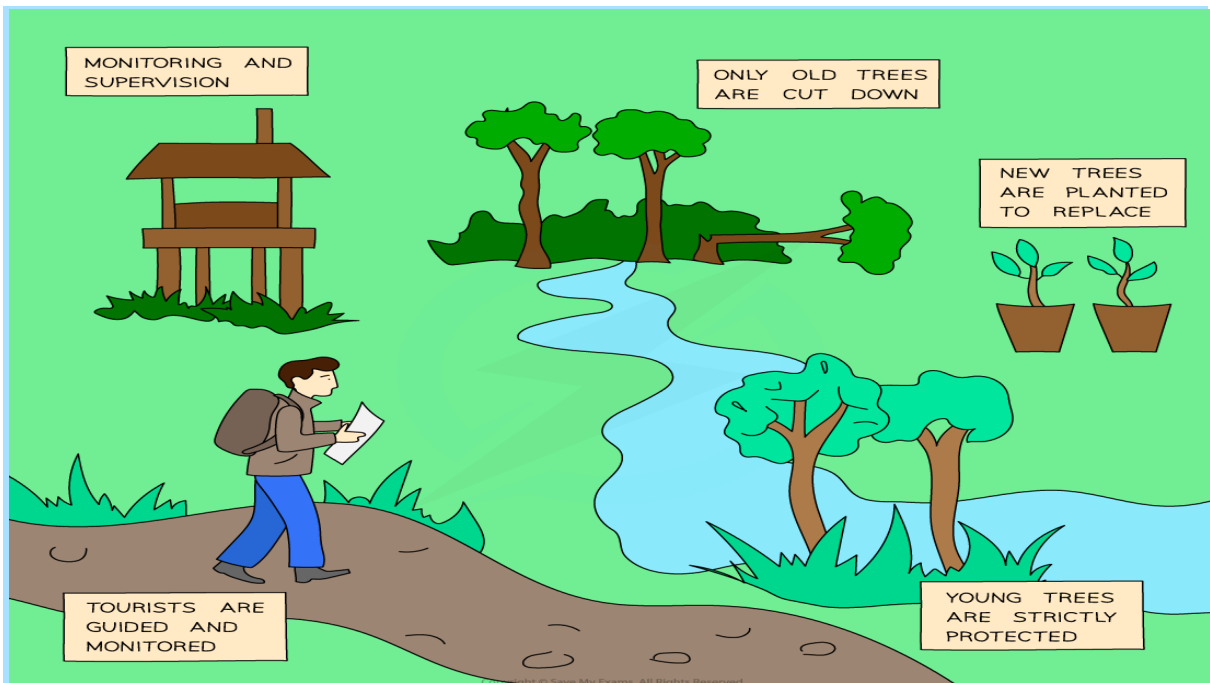
- Sustainable development is defined as development providing for the needs of an increasing human population without harming the environment
- When developing the way in which we use resources to manage them sustainably, we have to balance conflicting demands – eg:
 - the need for local people to be able to utilise the resources they have in their immediate environment with the needs of large companies to make money from resources such as forests and fish
 - the need for balancing the needs of humans for resources with the needs of the animals and plants that live in the areas the resources are taken from (preventing loss of habitat and extinction)
 - the need to balance what current populations need with what future populations might need – for example if we harvest all the fish we

need to feed people now, this might lead to overfishing which would deplete stocks for future generations

- For development to occur sustainably, people need to cooperate at local, national and international levels in the planning and management of resources

SUSTAINING FORESTS

- Forests are needed to produce paper products and provide wood for timber
- Much of the world's paper is now produced from forests which replant similar trees when mature trees are cut, ensuring that there will be adequate supply in the future
- Tropical hardwoods such as teak and mahogany take many years to regrow but are highly desirable for furniture
- Using these types of wood has now been made more sustainable due to the introduction of several schemes designed to monitor logging companies and track the wood produced (eg the Forestry Stewardship Council)
- Education helps to ensure logging companies are aware of sustainable practices and consumers are aware of the importance of buying products made from sustainable sources



More efforts are being made to manage forests sustainably so consumers know they are not causing damage to forests

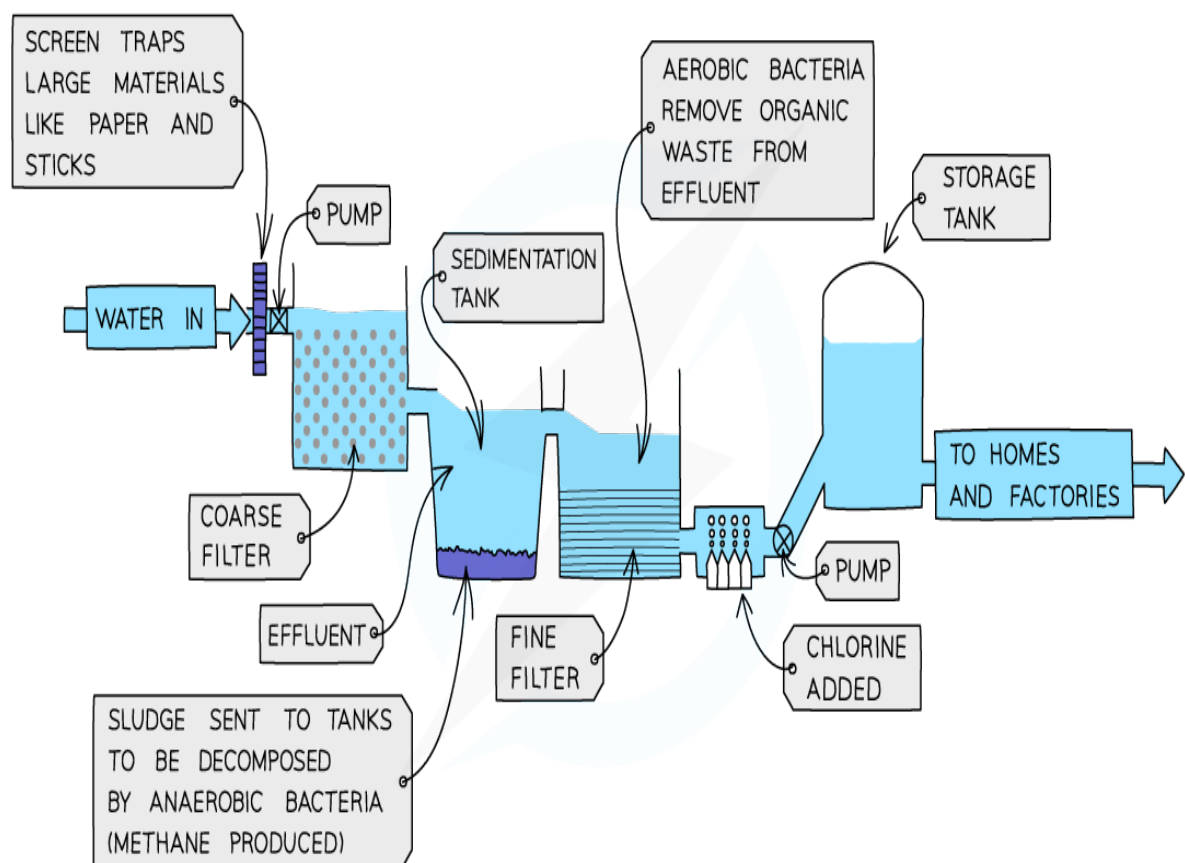
SUSTAINING FISH STOCKS

- Managing fish stocks sustainably includes:
 - Controlling the number of fish caught each year (quotas)
 - Controlling the size of fish caught (to ensure there are enough fish of a suitable age for breeding remaining)
 - Controlling the time of year that certain fish can be caught (to prevent large scale depletion of stocks when fish come together in large numbers in certain areas to breed)
 - Restocking (breeding and keeping offspring until they are large enough to survive in their natural habitat then releasing)
 - Educating fishermen as to local and international laws and consumers so they are aware of types of fish which are not produced sustainably and can avoid them when buying fish

SEWAGE TREATMENT

- As human population grows, the need for fresh water increases
- A significant amount of water we consume is used to flush away human waste (sewage) into pipes
- The pipes carry the sewage and water to treatment plants where the organic waste is removed and the water cleaned so it can be returned to natural water sources without causing eutrophication
- Crude sewage flows through a screen in which large materials like paper and sticks are trapped so they can be removed and burned
- The sewage is passed slowly through channels where grit and other heavy particles picked up along the way settle to the bottom – the grit is later washed and returned to the land
- The channels lead into sedimentation tanks where the solid material settles on the bottom as sludge and the liquid part, called effluent, remains on top

- The sludge is removed by pumping it into tanks where anaerobic bacteria decompose it – often the bacteria produce methane which can be collected and used as an energy source for the plant
- The effluent (liquid) is treated with aerobic bacteria to remove any organic waste in it, before being treated with chlorine to kill the bacteria
- At this point it is clean enough to return to natural water systems or be passed on to a second treatment plant where it is processed further to make it pure enough to reuse as drinking water



Copyright © Cassa Mu Eusse. All Rights Reserved

Water containing sewage goes through several stages of treatment before being returned to natural water system

ENDANGERED SPECIES

- An endangered species is at risk of becoming extinct
- There are several reasons why a species can become endangered – the population of the species may fall below a critical level due to
 - hunting
 - climate change
 - pollution
 - loss of habitat
 - introduction of non-native species that outcompete native species
- Endangered species can be helped by conservation measures such as:
 - education programmes
 - captive breeding programmes
 - monitoring and legal protection of the species and of their habitats
 - seed banks as a conservation measure for plants – seeds of endangered plant species are carefully stored so that new plants may be grown in the future
- A species may be at risk of becoming extinct if there is not enough genetic variation in the population as random changes in the environment may quickly cause extinction because the remaining organisms are all very similar and may not have the adaptations to survive such changes