Chapter 1: Natural Resources and Their Use

Questions — Questions and Activities

Q1 What can make what is today a renewable resource nonrenewable tomorrow? Describe some actions that can prevent this from happening.

SOLUTION

A renewable resource becomes non-renewable when it is exploited faster than Nature can restore or regenerate it — that is, when the natural rhythm of restoration and regeneration is disturbed.

The chapter gives several examples: harvesting timber faster than a forest can grow new trees will eventually deplete it; over-pumping groundwater at a rate greater than the water table is replenished causes a growing deficit; over-fishing during spawning seasons prevents fish populations from recovering.

Actions that can prevent this include: regulating extraction so that it does not exceed the natural rate of regeneration (e.g., traditional seasonal fishing bans); practising sustainable water harvesting and recharging ponds and tanks to replenish groundwater; using traditional farming methods such as mulching, multi-cropping, and natural fertilisers to maintain soil health; and managing forests so that only limited, sustainable quantities of timber are harvested at a time.

Answer: A renewable resource becomes non-renewable when it is harvested faster than Nature can restore it. Preventive actions include sustainable harvesting, traditional water conservation, and farming practices that allow soil and forests to regenerate.

Q2 Name five ecosystem functions that serve humans.

SOLUTION

The chapter explains that ecosystem functions are Nature's inherent ways of working, and when these benefit humans they are called 'ecosystem services'. Using the forest example the chapter provides, the following ecosystem functions serve humans:

1. Filtering and purifying water — forests naturally filter water, providing clean water to humans.
2. Preventing soil erosion — forests hold soil in place, protecting farmland.
3. Providing habitat for animals — forests support biodiversity, including

pollinators.

4. Pollinating crops — animals that live in forest habitats (such as bees) pollinate crops humans rely on for food.

5. Producing oxygen — a mature tree produces about 275 litres of oxygen per day, supporting human and animal life.

Answer: Five ecosystem functions that serve humans: (1) water filtration, (2) soil erosion prevention, (3) providing animal habitat (supporting pollinators), (4) crop pollination, and (5) oxygen production.

Q3 What are renewable resources? How are they different from non-renewable ones? What can people do to ensure that renewable resources continue to be available for our use and that of future generations? Give two examples.

SOLUTION

Renewable resources are those that can be restored and regenerated over time through Nature's own cycles — solar energy, wind energy, energy from flowing water, and timber from forests are examples, as long as they are managed sustainably.

Non-renewable resources, by contrast, are created over very long periods (millions of years) and cannot be replenished at the rate humans use them. Coal, petroleum, and minerals like iron, copper, and gold are non-renewable resources. Once used, they are effectively gone.

To keep renewable resources available for future generations, people must ensure that the natural rhythm of restoration and regeneration is not disturbed. Specifically: they must not harvest a resource faster than it can regenerate (e.g., not over-fishing, not felling trees faster than forests can regrow); and they should use traditional and sustainable practices — such as seasonal fishing bans to allow fish populations to recover, or water harvesting to recharge groundwater.

Two examples from the chapter: (1) Timber — forests are renewable as long as timber is harvested at a rate that allows trees to regrow; over-harvesting depletes the forest permanently. (2) Groundwater — aquifers replenish naturally through rainfall, but in Punjab over-pumping has made groundwater inaccessible, showing what happens when extraction exceeds the replenishment rate.

Answer: Renewable resources regenerate over time (e.g., solar energy, forests); non-renewable ones (e.g., coal, petroleum) cannot be replenished at human-use rates. To keep renewables available, extraction must not exceed Nature's rate of regeneration — for example, sustainable timber harvesting and regulated fishing.

Q4 What are some considerations to keep in mind in the production of goods for our current use?

SOLUTION

The chapter highlights several considerations through the examples of cement and traditional building materials.

First, pollution during production must be minimised or eliminated — cement production releases fine dust harmful to human lungs, animals, and plants, and contributes to soil and water pollution. Regulatory guidelines (such as those from the Central Pollution Control Board) help, but alternative materials should also be developed.

Second, production processes should aim to use sustainable materials — traditional materials like stone, mud, and new plant-based or recycled materials from waste plastic can reduce pollution compared to conventional industrial inputs.

Third, production methods should provide local employment and be designed with the local climate in mind, combining traditional knowledge with modern technological advances.

More broadly, the chapter notes that we must use non-renewable resources judiciously so they last long enough for humanity to find sustainable alternatives, and ensure that production does not push Nature's capacity for restoration and regeneration beyond its limits.

Answer: Key considerations: minimise pollution during production (e.g., controlling cement dust), use sustainable and alternative materials (mud, plant-based, recycled), provide local employment, design for the local climate, and use non-renewable inputs judiciously to allow time for sustainable alternatives to emerge.