

Strand I: Conservation of resources

1.1: Controlling soil pollution

Section A

1. B.
2. C.
3. C.
4. A.
5. C.

Section B

1. Soil pollution is the introduction of harmful substances into the soil, which reduces its productivity and harms living organisms in it.
2.
 - (a) Reduced soil fertility.
 - (b) Poor crop growth and low yields.
 - (c) Death of useful soil organisms
 - (d) Contamination of crops with harmful chemicals.
3. Continuous use of artificial fertiliser will gradually reduce soil fertility, degrade soil structure and lead to declining crop harvests.
4.
 - (a) Releases toxic chemical residues into the soil.
 - (b) pollutes the soil and kills useful soil organisms.
 - (c) contaminates soil, affecting crop growth.
5. Soil fertility will improve, soil structure and water-holding capacity will be better, and crop production will increase.
6.
 - (a) The waste water contains chemicals such as soap, detergents and bleach, which pollute the soil and harm soil organisms and crops.
 - (b) They should properly dispose of or treat the waste water before use or avoid pouring it directly onto the garden.
7.
 - (a) Proper disposal of household or garden waste.
 - (b) Composting organic waste.
 - (c) Recycling or reusing plastic containers.
 - (d) Using recommended amounts of fertilisers and chemicals.
 - (e) Practising organic farming.
 - (f) Using organic mulches.
 - (g) Planting vegetation cover.
8. (a) True. (b) True.
9. Accept any correct answer. Sample message: Do not dump plastic waste in gardens or farms. It does not decompose and pollutes the soil for many years. Reuse, recycle or dispose of plastics at designated collection points.
10. She can practise organic farming by:
 - (a) adding compost manure.
 - (b) reducing the use of artificial fertilisers and agricultural chemicals.

- (c) planting cover crops.
- (d) using organic mulches.
- (e) properly disposing of household and garden waste.

1.2: Constructing water retention structures

Section A

- 1. B.
- 2. A.
- 3. B.
- 4. B.

Section B

- 1. Water retention structures trap and store rainwater and surface runoff, keeping the soil moist for a longer period.
- 2. The trapped runoff water keeps the surrounding soil moist, supplying moisture to crop roots over a long period and reducing the frequency of irrigation needed during dry spells.
- 3. A sloping area where runoff water naturally flows. This ensures the ditch collects and stores the maximum amount of runoff water effectively.
- 4. The bananas will benefit from the moisture stored in the ditch, promoting healthy growth. Their roots will hold the soil together, preventing the ditch from collapsing.
- 5. They should clear the soil deposits, repair any parts damaged by erosion to ensure it continues to hold water effectively.
- 6. Water retention pits trap surface runoff, reducing its speed and volume as it flows across the garden. This allows water to soak slowly into the ground instead of washing away the topsoil.
- 7.
 - (a) Soil erosion- runoff washes away fertile topsoil.
 - (b) Loss of moisture- crops may dry up and wilt during dry spells due to lack of stored water.
- 8.
 - (a) Site selection.
 - (b) Marking the area and clearing vegetation.
 - (c) Digging the pit.
 - (d) Supporting or compacting the sides.
 - (e) Planting a suitable crop.
 - (f) Maintenance.
- 9. (b) Site selection → (d) Marking the area → (a) Digging the ditch → (e) Planting suitable crops → (c) Maintenance.

1.3: Conserving food nutrients

Section A

- 1. B.

2. B.
3. C.
4. C.

Section B

1. Keeping or preserving nutrients in vegetables during preparation and cooking.
2. Peel thinly to retain nutrients under the skin.
Peel immediately before cooking to reduce loss of nutrients through exposure to air.
3. Use little water, avoid overcooking and cook for a short time.
4. No. Cooking vegetables in an open pot without a lid does not conserve vitamins and minerals. Water-soluble vitamins are easily destroyed by prolonged heating and exposure to air. Some minerals may leach into the cooking water, especially if a large amount of water is used and later discarded.
5. Bicarbonate of soda destroys water-soluble vitamins, especially Vitamin C and certain B vitamins.
6. Cutting open the vegetables exposes their inner cells to oxygen in the air. This causes loss of nutrients through oxidation. Soaking the vegetables in water causes loss of water-soluble nutrients.

1.4 Growing trees

Section A

1. B.
2. C.
3. B.
4. C.

Section B

1.
 - (a) Air purification - Trees absorb carbon dioxide and pollutants during photosynthesis, releasing clean oxygen while trapping airborne dust on their leaves.
 - (b) Climate regulation - Trees release water vapor through transpiration, which cools the environment, increases humidity and aids cloud formation and rainfall.
2.
 - (a) Biodiversity support - Forests provide diverse micro-habitats, nesting sites, shelter and a continuous food supply for birds, insects and land animals. When trees are cut, these species lose their homes and resources, leading to decline in population.
 - (b) Water conservation - Trees act as natural sponges. Their roots break up tight soil, allowing rainwater to sink deeply into the ground instead of rushing away as surface runoff. This steady ground storage slowly feeds water into rivers like River Ziwa, keeping water levels stable even during dry spells.
3.
 - (a) Impact on people - Deforestation triggers localised droughts, which directly cause crop failure, food insecurity and poor harvests for farmers. It also wipes out wild medicinal plants that local communities rely on for healthcare.

- (b) Impact on the environment - Removing the tree canopy destroys the natural habitats of wildlife, causing a severe drop in local biodiversity. It also degrades the soil structure, making the area vulnerable to extreme weather and desertification.
- 4. Trees act as physical barriers or windbreaks. A line of trees slows down the velocity of strong winds, while their root systems hold the dry, loose topsoil firmly in place so it cannot be easily lifted and carried away by the wind as dust.
- 5.
 - (a) Proximity to permanent structures - Avoid planting too close to houses or fences, as deep roots or falling branches can damage foundations, walls or roofs.
 - (b) Availability of sunlight - Ensure the spot gets enough sunlight required for the specific tree species to grow.
 - (c) Soil type and depth - The soil needs to be deep enough for roots to anchor properly and fertile or well-draining enough to support growth.
 - (d) Access to a water source - The site should be easy to access for regular watering, especially during the seedling stage.
- 6. Natural rainfall provides plenty of consistent moisture, which helps the young roots to establish themselves firmly in the soil without relying heavily on manual watering.
- 7. Tree roots loosen the soil profile, improving its water infiltration capacity so that rain sinks into the ground rather than pooling on top. Additionally, tree trunks and fallen leaf litter physically slow down the movement of surface water runoff across farmland.
- 8. Applying mulch suppresses weed growth (which reduces competition for nutrients), protects the soil from direct sun, erosion and conserves soil moisture by heavily reducing evaporation.
- 9.
 - (a) It protects and restores topsoil by preventing wind and water erosion.
 - (b) It mitigates climate change by acting as a carbon sink.
 - (c) It restores lost ecological habitats, helping to conserve and bring back local biodiversity.
 - (d) It protects water catchments, safeguarding rivers and keeping local water cycles healthy.