

# **Comprehensive Notes On Green Skills (Unit 5)**

**Class IX - Employability Skills**

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# 1 Society and Environment

## **i** Natural Resources (Prakritik Sansadhan)

**What It Is:** Any natural or artificial substance, energy, or organism used by human beings for their welfare (e.g., water, land, soil).

**Why It Matters:** Ever since the earth was inhabited, humans have depended on things in nature to survive. They form the basis of life on Earth.

**How It Works:** Can be consumed directly (like fruits from forests) or indirectly (like thermal electricity generated from coal).

### 1.1 Types of Natural Resources

- Land Resources:** Finite resources used for agriculture, residence, and infrastructure.
- Forest Resources:** Self-sustaining vertical structures of trees providing wood, medicine, and regulating climate.
- Water Resources:** Covers about three-quarters of Earth. Vital for agriculture, industry, and households.
- Mineral Resources:** Naturally occurring solid, liquid, or gas in Earth's crust (e.g., iron, salt).
- Food Resources:** Plants and animals consumed by organisms.
- Energy Resources:** Produce heat or electricity (e.g., fossil fuels, solar energy).

| Category      | Description & Examples                                                                    |
|---------------|-------------------------------------------------------------------------------------------|
| Inexhaustible | Resources that cannot be exhausted by human consumption (e.g., solar, wind, tidal power). |
| Exhaustible   | Resources available in limited quantities that will run out (e.g., coal, petroleum).      |
| Renewable     | Constantly available or can be reasonably replaced (e.g., water, forest trees).           |
| Non-renewable | Cannot be easily replaced once destroyed (e.g., fossil fuels, minerals).                  |

Table 1: Classification of Natural Resources

### 1.2 Human Activities Damaging the Environment

#### **⚠** Stop Environmental Damage!

**Warning:** The increase in population and consumerism has led to rapid depletion of resources and extinction of several plant and animal species.

- Overexploitation:** Harvesting resources faster than they can replenish or reproduce.
- Mining:** Digging the earth for ores, leading to sinkholes, soil contamination, and biodiversity loss.
- Deforestation:** Clearing forests for non-forest uses like agriculture or housing.

 **Pollution:** Introducing harmful substances (pollutants) into our surroundings.

| Type            | Causes                                                 | Effects                                      |
|-----------------|--------------------------------------------------------|----------------------------------------------|
| Land Pollution  | Harmful pesticides, mining, solid waste from factories | Dysentery, cholera, less usable land         |
| Water Pollution | Throwing waste, sewage leakage, accidental oil spills  | Typhoid, diarrhea, local earnings affected   |
| Air Pollution   | Burning fuels, smoke from factories, exhaust fumes     | Breathing problems, climate change, droughts |

Table 2: Types of Pollution

### 1.3 Climate Change and Natural Disasters

-  **Greenhouse Effect:** Gases like Carbon Dioxide ( $CO_2$ ), Methane ( $CH_4$ ), Nitrous Oxide ( $N_2O$ ) and CFCs trap the Earth's heat from escaping, leading to global warming and rapid snow melt.
-  **Ozone Layer Depletion:** Harmful chemicals like chlorofluorocarbons (CFCs) create 'holes' in the ozone layer, allowing harmful solar radiation to enter, causing skin cancer.
-  **Natural Disasters:** Floods, earthquakes, landslides, and storms are often aggravated by human exploitation of natural resources.

### 1.4 Saving the Environment: The 3 Rs

#### Reduce, Reuse, Recycle

**What It Is:** The modern waste management concept.

**Why It Matters:** It is crucial to preserve the Earth for future generations and manage non-biodegradable pollutants.

**How It Works:**

- **Reduce:** Do not use what you do not need (e.g., minimal packaging, avoiding plastic).
- **Reuse:** Use materials for other purposes (e.g., cloth bags, making rags from old shirts).
- **Recycle:** Processing waste into new items (e.g., recycling glass, metal, paper, or composting wet waste).

## 2 Conserving Natural Resources

-  **Soil Conservation:** Maintenance of fertility (manure, crop rotation), reforestation, terracing, contour ploughing.
-  **Water Conservation:** Growing vegetation in catchments, building dams, sewage treatment, rainwater harvesting, watershed management.
-  **Energy Conservation:** Switching off lights, using energy-efficient bulbs, using pressure cookers, relying on solar/wind energy.
-  **Food Conservation:** Storing in warehouses or refrigerators to prevent spoilage by bacteria and microorganisms.

 **Forest Conservation:** Retaining existing forests or creating new ones with community participation.

### 3 Sustainable Development and Green Economy

#### Sustainable Development

**What It Is:** Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

**Why It Matters:** Current economic strategies are depleting resources rapidly; we need to ensure our survival and protect biodiversity.

**How It Works:** Practicing a sustainable lifestyle, like sustainable agriculture that provides food without damaging ecosystems.

#### 3.1 Green Economy

 **Green Economy:** A system that promotes economic growth while caring for the environment (low carbon, resource-efficient, and socially inclusive).

 **Green Consumer:** Someone who purchases eco-friendly products with little packaging and natural ingredients.

| Component             | Description                                                                              |
|-----------------------|------------------------------------------------------------------------------------------|
| Renewable Energy      | Using wind, solar, biomass for power. India ranks top 10 in renewable energy production. |
| Green Building        | Minimum damage during construction; efficient resource use (energy, water, materials).   |
| Sustainable Transport | Low cost, moves people quickly with zero or minimal environmental damage.                |
| Waste Management      | Using the 3Rs (Reduce, Reuse, Recycle) to separate waste before throwing.                |
| Land Management       | Using land for farming or factories without causing damage to the environment.           |

Table 3: Components of a Green Economy

#### 3.2 Green Skills and Green Jobs

##### Green Skills

**What It Is:** Technical skills, knowledge, values, and attitudes needed to support a sustainable society and workforce.

**Why It Matters:** Crucial for the transition from an emissions-intensive economy to cleaner production and restoring environmental quality.

**How It Works:** Applying these skills in 'Green Jobs' across sectors like agriculture (organic farming), construction (green builders), and energy (solar pump technicians).

#### 3.3 Green Projects

Various organizations are implementing green projects to save the environment:

- ✓ **Swachh Cooperative (Pune):** Owned by waste pickers; integrates informal pickers into a decentralized solid waste management system. They generate biogas from wet waste.
- ✓ **Modern Chulha:** Developed by Society of Development and Environment Protection. Uses 50% less wood and reduces smoke by 80%, preventing health hazards.
- ✓ **Biotoilet (Green Solution Foundation):** Uses aerobic bacteria in a bio-digester tank to convert human waste into environment-standard compatible water for flushing or irrigation.

## 4 Comprehensive Question Bank

### 4.1 A. Multiple Choice Questions (MCQs)

1. What is a resource that cannot be exhausted called?

- (a) Exhaustible                      (b) Renewable                      (c) Inexhaustible                      (d) Artificial

Ans: (b) Renewable

2. Which of the following is a greenhouse gas?

- (a) Oxygen                      (b) Nitrogen                      (c) Methane ( $CH_4$ )                      (d) Argon

Ans: (c) Methane ( $CH_4$ )

3. The 3 Rs stand for:

- (a) Read, Write, Run                      (c) Rest, Relax, Recreate  
(b) Reduce, Reuse, Recycle                      (d) Rain, River, Reservoir

Ans: (b) Reduce, Reuse, Recycle

4. A green consumer buys:

- (a) Plastic items                      (c) Imported goods  
(b) Eco-friendly products                      (d) Expensive items

Ans: (b) Eco-friendly products

5. Which of these is a non-renewable resource?

- (a) Solar energy                      (c) Coal  
(b) Wind energy                      (d) Forest trees

Ans: (c) Coal

6. Rainwater harvesting is a method of:

- (a) Soil conservation                      (c) Energy conservation  
(b) Water conservation                      (d) Forest conservation

Ans: (b) Water conservation

7. The 'Ozone Layer' protects us from:

- (a) Rain                      (c) Harmful solar radiation  
(b) Wind                      (d) Meteors

Ans: (c) Harmful solar radiation

8. Which sector involves 'Organic farming' as a green job?

- (a) Construction                      (b) Agriculture                      (c) Retail                      (d) Automotive

Ans: (b) Agriculture

9. What causes land pollution?

- (a) Loud noises                      (c) Smoke from factories  
(b) Harmful pesticides                      (d) Oil spills

Ans: (b) Harmful pesticides

10. 'Swachh Cooperative' in Pune is an example of:

- (a) Forest management                      (c) Water management  
(b) Solid waste management                      (d) Energy generation

Ans: (b) Solid waste management

11. Contour ploughing helps in:

- (a) Reducing air pollution                      (c) Saving electricity  
(b) Checking soil erosion                      (d) Water purification

Ans: (b) Checking soil erosion

12. Sustainable development meets the needs of the:

- (a) Past                      (c) Future only  
(b) Present without compromising the future                      (d) Industries only

Ans: (b) Present without compromising the future

13. Which is a source of renewable energy?

- (a) Petroleum                      (b) Natural gas                      (c) Biomass                      (d) Minerals

Ans: (c) Biomass

14. CFCs destroy the:

- (a) Soil                      (b) Water bodies                      (c) Ozone layer                      (d) Forests

Ans: (c) Ozone layer

15. Terracing is practiced mostly in:

- (a) Deserts                      (b) Plains                      (c) Hilly areas                      (d) Oceans

Ans: (c) Hilly areas

## 4.2 B. Assertion-Reasoning Questions

*Directions: In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as: (a) Both A and R are true and R is the correct explanation of A. (b) Both A and R are true but R is NOT the correct explanation of A. (c) A is true but R is false. (d) A is false but R is true.*

- Assertion (A):** Coal and petroleum are exhaustible resources.  
**Reason (R):** They are available in limited quantities and take millions of years to form.  
**Answer:** (a) Both A and R are true and R is the correct explanation of A.
- Assertion (A):** Deforestation leads to an increase in global warming.  
**Reason (R):** Trees absorb carbon dioxide, and cutting them down increases greenhouse gases in the atmosphere.  
**Answer:** (a) Both A and R are true and R is the correct explanation of A.
- Assertion (A):** We should use pressure cookers for cooking food.  
**Reason (R):** Pressure cookers consume more energy than open vessels.  
**Answer:** (c) A is true but R is false. (Pressure cookers save energy).
- Assertion (A):** Solar energy is a non-renewable resource.  
**Reason (R):** Sun's energy is constantly available and cannot be exhausted by human consumption.  
**Answer:** (d) A is false but R is true.
- Assertion (A):** Green jobs contribute to preserving or restoring environmental quality.  
**Reason (R):** Green jobs are only found in the agriculture sector.  
**Answer:** (c) A is true but R is false. (Green jobs exist in many sectors like construction, energy, etc.).

## 4.3 C. One-Word / Brief Answer Questions

- Name the layer in the atmosphere that protects us from harmful solar radiation.  
**Ans:** Ozone Layer.
- Give one example of an inexhaustible resource.  
**Ans:** Solar energy (or wind/tidal power).
- What is the process of planting trees to reduce soil erosion called?  
**Ans:** Reforestation.
- Name the greenhouse gas produced by the decomposition of organic matter.  
**Ans:** Methane ( $CH_4$ ).
- What do the 3 Rs stand for in waste management?  
**Ans:** Reduce, Reuse, Recycle.
- Which practice involves dividing a slope into flat fields to control water run-off?  
**Ans:** Terracing.
- Name a green job in the construction sector.  
**Ans:** Green builder / Green design professional.
- What type of pollution is caused by smoke from factories and vehicle exhaust?  
**Ans:** Air Pollution.
- Which natural resource covers about three-quarters of Earth's surface?  
**Ans:** Water.

10. What term is used for the variety and richness of all plant and animal species?

**Ans:** Biodiversity (Biological diversity).

#### 4.4 D. Differentiate Between

| Renewable Resources                                                                                      | Non-Renewable Resources                                                           |
|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Constantly available or can be reasonably re-placed.<br>Examples: Water, solar energy, vegetative lands. | Cannot be easily replaced once destroyed.<br>Examples: Coal, petroleum, minerals. |

  

| Biodegradable Pollutants                                                                                  | Non-Biodegradable Pollutants                                                                                  |
|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Break down into simpler, harmless substances naturally.<br>Examples: Vegetable waste, paper, cattle dung. | Cannot be broken down naturally and persist for hundreds of years.<br>Examples: Plastics, insecticides, lead. |

#### 4.5 E. Short Answer Questions

1. **What is meant by 'Green Economy'?**

**Ans:** A green economy is a system that promotes economic growth while reducing environmental risks and ecological scarcities. It is low carbon, resource-efficient, and socially inclusive.

2. **List any three ways to conserve energy at home.**

**Ans:** (1) Switch off lights and fans when not in use. (2) Use energy-efficient LED bulbs. (3) Use a pressure cooker to save cooking energy.

3. **Why is soil conservation important? Mention one method.**

**Ans:** Soil conservation prevents soil erosion and maintains fertility, which is crucial for agriculture. One method is contour ploughing, which traps water and checks erosion.

4. **What are the main causes of water pollution?**

**Ans:** Throwing waste into water bodies, leakage from sewer lines, release of industrial effluents, and accidental oil leakage from ships.

5. **Who is a 'Green Consumer'?**

**Ans:** A green consumer is someone who buys eco-friendly products, prefers items with minimal packaging, and supports products made from natural, non-polluting ingredients.

#### 4.6 F. Long Answer Questions

1. **Define sustainable development. Why is it necessary in today's world?**

**Ans:** Sustainable development is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It is necessary today because our current strategies are rapidly depleting natural resources and causing severe environmental degradation (like climate change and pollution). If we do not adopt sustainable practices, we risk irreversible damage to biodiversity and exhaust resources vital for future survival.

2. **Explain the components of a Green Economy.**

**Ans:** The major components of a Green Economy include:

- **Renewable Energy:** Using wind, solar, and biomass instead of fossil fuels to reduce pollution.

- **Green Building:** Constructing buildings that minimize environmental damage and use energy/water wisely.
- **Sustainable Transport:** Promoting transport systems that are cost-effective, efficient, and cause minimal to no environmental damage (e.g., EVs, carpooling).
- **Waste Management:** Implementing the 3Rs (Reduce, Reuse, Recycle) to minimize landfill waste.
- **Land and Water Management:** Using resources efficiently without causing pollution or degradation.

3. **Describe any three human activities that cause damage to the environment.**

**Ans:** 1. **Overexploitation:** Harvesting natural resources (like overfishing or excessive logging) faster than they can replenish, leading to species extinction.

2. **Mining:** Digging for ores and minerals destroys habitats, causes soil erosion, and contaminates groundwater with harmful chemicals.

3. **Deforestation:** Clearing forests for agriculture or urban development leads to loss of habitat, disruption of the water cycle, and increased greenhouse gases.

## 4.7 G. Case-Study / Competency-Based Questions

**Case Study 1:** The city of Pune faced a massive solid waste management problem. A local organization, 'Swachh Cooperative', entirely owned by waste pickers, stepped in to provide door-to-door waste collection. They segregated wet and dry waste, used wet waste to generate biogas, and sent dry waste for recycling. This initiative not only cleaned the city but provided dignified employment.

1. **What environmental issue was Pune facing?**

**Ans:** Pune was facing a massive solid waste management problem.

2. **How did 'Swachh Cooperative' handle wet waste?**

**Ans:** They used wet waste to generate biogas through biological regeneration.

3. **Which 'R' of the 3Rs is demonstrated by sending dry waste to factories?**

**Ans:** Recycling.

4. **How does this project contribute to a 'Green Economy'?**

**Ans:** It reduces environmental pollution (waste management), generates renewable energy (biogas), and creates green jobs (social equity).

**Case Study 2:** Ravi lives in a village where electricity is scarce. He recently installed a 'Modern DEEP Chulha' in his house, which uses 50% less firewood and produces 80% less smoke compared to traditional chulhas. This chulha was built by local masons trained by a green initiative.

1. **Which natural resource is Ravi conserving by using the new Chulha?**

**Ans:** Forest resources (firewood/biomass).

2. **How does the Modern Chulha benefit Ravi's health?**

**Ans:** It produces 80% less smoke, reducing the risk of respiratory and breathing problems.

3. **What kind of 'jobs' did the project create for local masons?**

**Ans:** Green jobs (building eco-friendly, energy-efficient stoves).

4. **Is firewood a renewable or non-renewable resource in this context, and why?**

**Ans:** It is considered renewable if trees are continuously replanted (reforestation), but exhaustible if overexploited without replenishment.