

Comprehensive Notes:

Unit 5: Green Skills

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1 Comprehensive Notes

1.1 Introduction to Green Skills

Our planet is currently experiencing unpredictable weather conditions due to deterioration of the environment through the depletion of resources like air, water, and soil is a global problem.

Green Skills are the knowledge, abilities, values, and attitudes needed to live in, develop, and support a sustainable and resource-efficient society. They are the skills we need to adopt practices that are environment-friendly and avoid processes that harm our surroundings.

Examples of simple eco-friendly practices include:

- Planting trees.
- Using eco-friendly transport (bicycles, electric cars).
- Conserving water (not leaving taps running).
- Using cloth bags instead of plastic.
- Reducing paper usage.
- Using non-toxic and natural products for cleaning.
- Using indoor plants (like Areca palm and rubber plants) for air purification.

1.2 Session 1: Green Jobs

1.2.1 What is a Green Job?

A **green job** is defined as a job that helps protect and restore the environment. These jobs can be in traditional sectors (like manufacturing or construction) or new sectors (like renewable energy).

According to the **United Nations Environment Program (UNEP)**, green jobs (or green-collar jobs) are works in agricultural, administrative, research and development (R&D), manufacturing, and service activities that contribute substantially to preserving or restoring environmental quality.

A **green-collar worker** is someone employed in the environmental sectors of the economy.

- **Examples of Professionals:** Green building architects, environmental consultants, waste management managers, solar energy engineers, organic farmers, and environmental lawyers.
- **Examples of Technicians/Workers:** Electricians who install solar panels, plumbers who install solar water heaters, and construction workers who build energy-efficient buildings.

At the enterprise level, green jobs can be distinguished in two ways:

1. **Green Outputs:** Producing goods or providing services that benefit the environment (e.g., green buildings, clean transportation).
2. **Green Processes:** Contributing to more environment-friendly processes (e.g., reducing water consumption, improving recycling systems).

1.2.2 Green Jobs in India

India has adopted several measures for sustainability, such as:

- Reducing Carbon Dioxide (CO₂) emission rates from vehicles.
- Promoting non-fossil fuels (solar, hydro, wind) for power generation.
- Enabling energy-efficient technologies through green buildings.

The **Ministry of Skill Development and Entrepreneurship** has set up the '**Skill Council for Green Jobs**' to develop the competencies of people in renewable energy, sustainable development, and waste management. The '**Make in India**' campaign also provides an impetus for green jobs.

1.2.3 Benefits of Green Jobs

The greening of the economy is a key economic driver. Green jobs help to:

- Increase the efficiency of energy and raw material use.
- Reduce greenhouse gas emissions.
- Control waste and pollution.
- Protect and restore ecosystems.
- Support adaptation to the effects of climate change.

1.3 Green Jobs in Various Sectors

Sector	Description and Examples of Green Jobs
Agriculture	Organic farming is a key area, as it prevents toxic runoff and soil contamination by avoiding synthetic pesticides and chemical fertilizers. Farmer Producer Organisations (FPOs) help small farmers reduce risk. The Krishi Vigyan Kendras (KVKs) help with training. Jobs: Organic farmer, Integrated Pest Management (IPM) specialist, farm mechanisation technician, agriculture tourism operator.
Transportation	Focuses on energy-efficient vehicles and alternate fuels like CNG and biofuels . The Energy Efficiency Services Limited (EESL) has launched an electric vehicle (EV) program to boost e-mobility. Jobs: Electric vehicle technician, e-rickshaw maintenance worker, bio-fuel production specialist.
Water Conservation	Involves processes like rooftop rainwater harvesting (collecting rainwater in tanks) and efficient irrigation (e.g., bamboo drip irrigation). Jobs: Water quality testing technician, water conservation specialist, water management planner, rainwater harvesting installer.
Solar & Wind Energy	These power plants provide clean energy. Jobs: Solar Photovoltaic (PV) Installer, solar lighting technician, roofer (specialising in solar), wind farm field technician.
Eco-tourism	Intended to provide visitors with an experience that emphasizes conserving resources, reducing waste, and enhancing the natural environment. Jobs: Eco-tour guide, eco-tourism operator.
Building & Construction	Green buildings use sustainable materials, eco-friendly construction processes, and green operations. The Indian Green Building Council (IGBC) develops rating programmes and training. Jobs: Green building construction worker, landscape architect, gardener, water management specialist (for buildings).
Solid Waste Management	This system includes the collection, segregation, transportation, processing, and disposal of discarded solid fractions from all sources. Jobs: E-waste recycling manager, solid waste management technician, waste auditor, waste reduction specialist.
Appropriate Technology	This is small-scale technology that is environment-friendly and suited to local needs. Examples include bike-powered water pumps, solar lamps, and biogas production. Jobs: Biogas plant technician, water treatment filtration specialist, solar lamp assembler.

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Table 1 – continued from previous page

Sector	Description and Examples of Green Jobs
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Table 1: Green Jobs Across Different Sectors

1.4 Session 2: Importance of Green Jobs

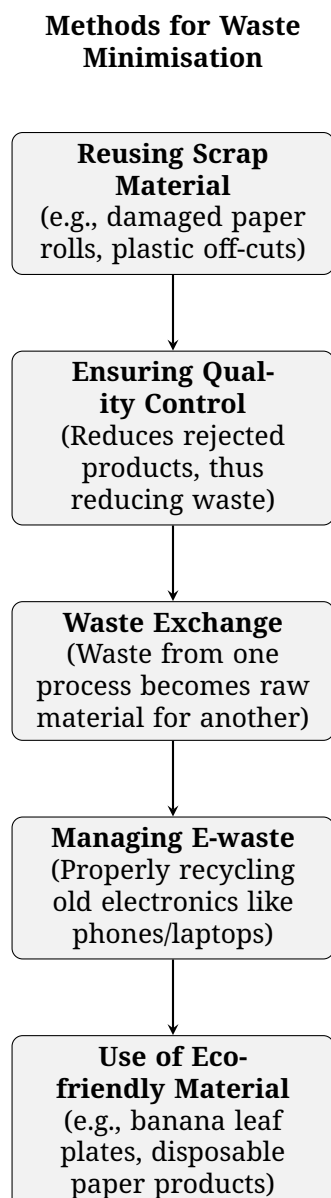
Green jobs are crucial because they directly address the most significant environmental challenges.

1.4.1 Limiting Greenhouse Gas (GHG) Emissions

- **The Problem:** Greenhouse gases (like Carbon Dioxide, Methane, Nitrous Oxide, CFCs) are emitted by burning fossil fuels, vehicles, and agriculture. These gases trap heat from the earth, causing 'global warming'.
- **The Solution:** Green jobs help reduce the use of fossil fuels by finding and implementing less-polluting energy sources, such as Compressed Natural Gas (CNG), solar, and wind power.

1.4.2 Minimising Waste and Pollution

Instead of only focusing on recycling, green jobs aim to **reduce** the amount of waste produced in the first place.



1.4.3 Protecting and Restoring Ecosystems

- **The Problem:** An **ecosystem** is the perfect balance where all living (plants, animals) and non-living (water, air) beings exist together. Human activities, like excessive felling of trees (deforestation), can destroy this balance, leading to climate change and natural disasters.
- **The Solution:** Green jobs help conserve existing ecosystems and restore degraded ones. For example, planting forests helps stabilize slopes and reduce landslide risk. Protecting wetlands helps control floods.

1.4.4 Adapting to the Effects of Climate Change

- **The Problem:** Even if we stop all emissions today, some climate change will still happen due to past damage.
- **The Solution (Adaptation):** We must find ways to survive in the new climatic conditions. This is called **adaptation**. For example, if there is less rain (drought), farmers will need to grow crops that can survive in drought conditions.

1.4.5 National Action Plan on Climate Change (NAPCC)

The Government of India launched the **NAPCC** in June 2008 to deal with climate change. It consists of **eight missions** to address mitigation (reducing emissions) and adaptation (dealing with effects).

Table 2: The 8 Missions of the NAPCC

National Action Plan on Climate Change (NAPCC) - 8 Missions

1. National Solar Mission	5. National Mission for Sustaining the Himalayan Ecosystem
2. National Mission for Enhanced Energy Efficiency	6. National Mission for a "Green India" (Forestry)
3. National Mission on Sustainable Habitat	7. National Mission for Sustainable Agriculture
4. National Water Mission	8. National Mission on Strategic Knowledge for Climate Change

2 Practice Questions

2.1 Multiple Choice Questions (MCQs)

1. What is a job that helps protect and restore the environment called?

- | | |
|------------------------|----------------------|
| (A) A blue-collar job | (C) A green job |
| (B) A white-collar job | (D) A high-skill job |

Answer: (C)

2. Which UN agency defines green jobs as work that contributes to preserving environmental quality?

- | | |
|------------|----------|
| (A) UNICEF | (C) UNEP |
| (B) UNESCO | (D) WHO |

Answer: (C)

3. Which of the following is an example of a "green-collar worker"?

- | | |
|--------------------------|-----------------------------|
| (A) A stockbroker | (C) A solar panel installer |
| (B) A software developer | (D) A fast-food worker |

Answer: (C)

4. The Ministry of Skill Development and Entrepreneurship set up which council to develop competencies for green jobs?

- | | |
|----------------------------------|-------------------------------|
| (A) Skill Council for Green Jobs | (C) Environment Skill Council |
| (B) National Skill Council | (D) Green Energy Council |

Answer: (A)

5. Which of the following is a benefit of organic farming?

- | | |
|-----------------------------------|---|
| (A) It uses chemical fertilizers. | (C) It requires more water. |
| (B) It prevents toxic runoff. | (D) It is faster than conventional farming. |

Answer: (B)

6. What are collectives of 15-20 farmers at the village level called?

- | | |
|--|----------------------------------|
| (A) Farmer Producer Organisations (FPOs) | (C) Krishi Vigyan Kendras (KVKs) |
| (B) Farmer Interest Groups (FIGs) | (D) Self-Help Groups (SHGs) |

Answer: (B)

7. EESL, under the Ministry of Power, launched a program for what type of vehicles?

- | | |
|-----------------------|-----------------------|
| (A) Diesel vehicles | (C) CNG vehicles |
| (B) Electric vehicles | (D) Hydrogen vehicles |

Answer: (B)

8. Which of the following is NOT a green job in the water conservation sector?

- (A) Water quality testing
- (B) Rooftop rainwater harvesting installer
- (C) Solar panel technician
- (D) Water management specialist

Answer: (C)

9. What does IGBC, part of the Confederation of Indian Industry (CII), stand for?

- (A) Indian Green Building Council
- (B) Indian Green Business Council
- (C) Indian Great Building Corporation
- (D) International Green Building Council

Answer: (A)

10. When the waste product of one process becomes the raw material for another, it is called:

- (A) Recycling
- (B) E-waste
- (C) Quality control
- (D) Waste exchange

Answer: (D)

11. When was the National Action Plan on Climate Change (NAPCC) launched by the Government of India?

- (A) 2005
- (B) 2008
- (C) 2014
- (D) 2020

Answer: (B)

12. How many "missions" are included in the NAPCC?

- (A) 4
- (B) 6
- (C) 8
- (D) 10

Answer: (C)

2.2 One-Word Answer Questions

1. Jobs that help protect and restore the environment. (*Green jobs*)
2. The UN agency that provides a comprehensive definition of green jobs. (*UNEP*)
3. A person employed in the environmental sectors of the economy. (*Green-collar worker*)
4. Farming that avoids synthetic pesticides and chemical fertilizers. (*Organic farming*)
5. Organizations that are farmer collectives, typically with small or marginal farmers as members. (*FPOs*)
6. A fuel, such as CNG, that is an alternative to traditional fossil fuels. (*Alternate fuel*)
7. The process of collecting and storing rainwater from roofs in tanks. (*Rooftop rainwater harvesting*)
8. Tourism intended to conserve resources and reduce waste. (*Eco-tourism*)
9. Buildings that use sustainable materials and eco-friendly processes. (*Green buildings*)
10. Discarded solid fractions from domestic, commercial, or industrial units. (*Solid waste*)
11. Small-scale, environment-friendly technology suited to local needs. (*Appropriate technology*)

12. Gases like CO₂ and methane that trap heat and cause global warming. (*Greenhouse gases*)
13. The process where one company's waste becomes another's raw material. (*Waste exchange*)
14. The community of living and non-living beings existing and interacting together. (*Ecosystem*)
15. The process of finding ways to survive in new climatic conditions. (*Adaptation*)
16. The full form of NAPCC. (*National Action Plan on Climate Change*)

2.3 Differentiate Between Questions

1. Green Outputs and Green Processes

Answer: Green Outputs (Products/Services) are the final goods or services that benefit the environment, such as a green building or a clean transportation service. Green Processes are the methods used to produce goods or services in a more environment-friendly way, such as reducing water consumption or improving recycling systems, even if the final product isn't "green".

2. Organic Farming and Conventional Farming

Answer: Organic farming grows plants and crops in an environment-friendly way by avoiding all synthetic pesticides and chemical fertilizers, which prevents toxic runoff and soil contamination. Conventional farming often relies on these chemical inputs to maximize yield.

3. Solid Waste and E-waste

Answer: Solid waste is any discarded solid fraction from a wide variety of sources (domestic, industrial, commercial, etc.). E-waste (electronic waste) is a specific category of solid waste that includes discarded electronic items like old mobile phones, laptops, and televisions, which often contain hazardous materials.

4. Climate Change Mitigation and Climate Change Adaptation

Answer: Mitigation refers to actions taken to reduce the emission of greenhouse gases to slow down or stop global warming (e.g., using solar panels instead of coal). Adaptation refers to actions taken to live with the effects of climate change that are already happening or are unavoidable (e.g., building sea walls to protect against rising sea levels, or planting drought-resistant crops).

5. Appropriate Technology and High-End Technology

Answer: Appropriate technology is small-scale, locally-suited, and environment-friendly (e.g., a hand-powered water pump). High-end technology is typically complex, large-scale, and may or may not be eco-friendly (e.g., a nuclear power plant).

2.4 Short Answer Questions

1. What is a green job, according to UNEP?

Answer: The United Nations Environment Program (UNEP) defines green jobs as works in agricultural, administrative, research and development, manufacturing, and service activities that contribute substantially to preserving or restoring environmental quality.

2. List two benefits of green jobs.

Answer: Two benefits of green jobs are: (1) They help reduce greenhouse gas emissions, and (2) They help control waste and pollution. (Other answers: increase energy efficiency, protect ecosystems, support climate adaptation).

3. What is organic farming? Why is it considered "green"?

Answer: Organic farming is a process of growing plants and crops in an environment-friendly way. It is considered "green" because it prevents toxic runoff, water pollution, and soil contamination by not using any synthetic pesticides or chemical fertilizers.

4. Give two examples of green jobs in the transportation sector.

Answer: Two examples are: (1) Technicians who handle and maintain e-rickshaws or other electric vehicles, and (2) Engineers or workers involved in the production of biofuels.

5. **What is rooftop rainwater harvesting?**

Answer: Rooftop rainwater harvesting is the process where rainwater that falls on the roofs of houses or buildings is collected, often in tanks, so it can be stored and used later. It also helps in increasing the ground water table.

6. **What is e-waste?**

Answer: E-waste (electronic waste) is a type of solid waste that consists of any discarded electronic devices, such as old mobile phones, laptops, television sets, and refrigerators.

7. **What is an ecosystem?**

Answer: An ecosystem is the community of living beings (plants, animals, organisms) and non-living beings (air, water, soil) existing together, and interacting with and supporting each other in a balanced way.

8. **What is the "waste exchange" method of minimising waste?**

Answer: Waste exchange is a method of waste reduction where the waste product of one process or factory becomes the raw material for another. This represents a way of reducing waste disposal through re-use.

9. **What is "appropriate technology"? Give one example.**

Answer: Appropriate technology is a small-scale technology that is environment-friendly and suited to the local needs and resources of a community. One example is a solar lamp or a bike-powered water pump.

10. **What is a "green building"?**

Answer: A green building is a house or building that is environment-friendly. It is designed to use sustainable building materials, follow eco-friendly construction processes, and have green operations (like water management and energy efficiency).

2.5 Long Answer Questions

1. **What are "green jobs"? Explain the main benefits of greening the economy.**

Answer: A green job is defined as one that helps to protect and restore the environment, contributing to environmentally sustainable forms of production and consumption. According to the UNEP, it is any work that contributes substantially to preserving or restoring environmental quality. The benefits of "greening the economy" by creating more green jobs are significant:

- **Increases Efficiency:** It promotes better and more efficient use of energy and raw materials, reducing waste and cost.
- **Reduces GHG Emissions:** It directly helps in limiting greenhouse gas emissions (like CO₂) by promoting renewable energy (solar, wind) and reducing reliance on fossil fuels.
- **Controls Waste and Pollution:** It creates jobs focused on waste reduction, management (solid waste, e-waste), and pollution control.
- **Protects and Restores Ecosystems:** Many green jobs, like those in organic farming and eco-tourism, are designed to protect natural ecosystems and restore those that have been degraded.
- **Supports Climate Change Adaptation:** It helps create the technologies and strategies needed to adapt to the effects of climate change, such as water management systems.

2. **List and explain five different sectors that have green jobs, giving one job example for each.**

Answer: Green jobs exist across many sectors. Five key examples are:

- (a) **Agriculture:** This sector is greened through practices like organic farming, which avoids chemical pesticides. **Job Example:** An Integrated Pest Management (IPM) specialist who helps farmers control pests using natural methods.
- (b) **Solar and Wind Energy:** This sector is inherently green as it produces clean energy. **Job Example:** A Solar Photovoltaic (PV) Installer who installs and maintains solar panels on rooftops.

- (c) **Building and Construction:** This involves creating "green buildings" that are energy and resource-efficient. **Job Example:** A green building architect who designs buildings that use sustainable materials and natural lighting.
- (d) **Transportation:** This sector is greened by moving to energy-efficient vehicles. **Job Example:** An electric vehicle (EV) technician who services and repairs electric cars or e-rickshaws.
- (e) **Solid Waste Management:** This sector focuses on managing our trash in an eco-friendly way. **Job Example:** An e-waste recycling manager who safely disassembles and processes old electronics.

3. **What is the importance of green jobs in "minimising waste and pollution"? Explain at least three methods for waste reduction.**

Answer: Green jobs are vital for minimising waste and pollution because they shift the focus from simple "disposal" to "reduction" and "reuse". They create an economy around being more efficient. Three key methods for waste reduction are:

- **Reusing Scrap Material:** In many industries (like paper mills or plastic manufacturing), green processes involve collecting damaged rolls, off-cuts, or scrap and re-incorporating them back into the production line as raw material.
- **Ensuring Quality Control:** Green jobs in quality control use methods (like automated monitoring) to identify production problems early. This decreases the number of rejected or defective products, which in turn reduces the amount of waste that has to be discarded.
- **Waste Exchange:** This is an innovative green solution where one process's waste product becomes the raw material for another. This prevents the waste from going to a landfill and reduces the need for new raw materials for the second process.

4. **What is the National Action Plan on Climate Change (NAPCC)? List its eight missions.**

Answer: The National Action Plan on Climate Change (NAPCC) is a comprehensive plan launched by the Government of India in June 2008. Its purpose is to provide a framework for dealing with climate change and its related issues. It addresses both the "mitigation" of greenhouse gases (how to reduce them) and the "adaptation" to the adverse impacts of climate change (how to live with the effects). The NAPCC comprises eight specific missions:

- (a) National Solar Mission
- (b) National Mission for Enhanced Energy Efficiency
- (c) National Mission on Sustainable Habitat
- (d) National Water Mission
- (e) National Mission for Sustaining the Himalayan Ecosystem
- (f) National Mission for a "Green India" (focused on forestry)
- (g) National Mission for Sustainable Agriculture
- (h) National Mission on Strategic Knowledge for Climate Change

5. **Explain the difference between "Green Collar" jobs in high-tech fields versus those in traditional trades. Give an example for each.**

Answer: Green-collar jobs are not just one type of job; they exist across a wide range of skill levels and educational backgrounds.

- **High-Tech/Professional Fields:** These are jobs that typically require a college degree or specialized scientific/technical knowledge. They are often focused on research, design, and planning. **Example:** An environmental consultant who performs audits for a large company, or a biological systems engineer who designs a new biogas plant.
- **Traditional Trades:** These are skilled jobs that have been "greened" by applying new, eco-friendly technologies. They are often hands-on and focused on installation and maintenance. **Example:** A plumber who is trained to install solar water heaters, or an electrician who knows how to install and wire a home's solar panel system.

Both types of workers are essential. The engineer designs the solar panel, but the electrician (a traditional trade) is needed to install it correctly.