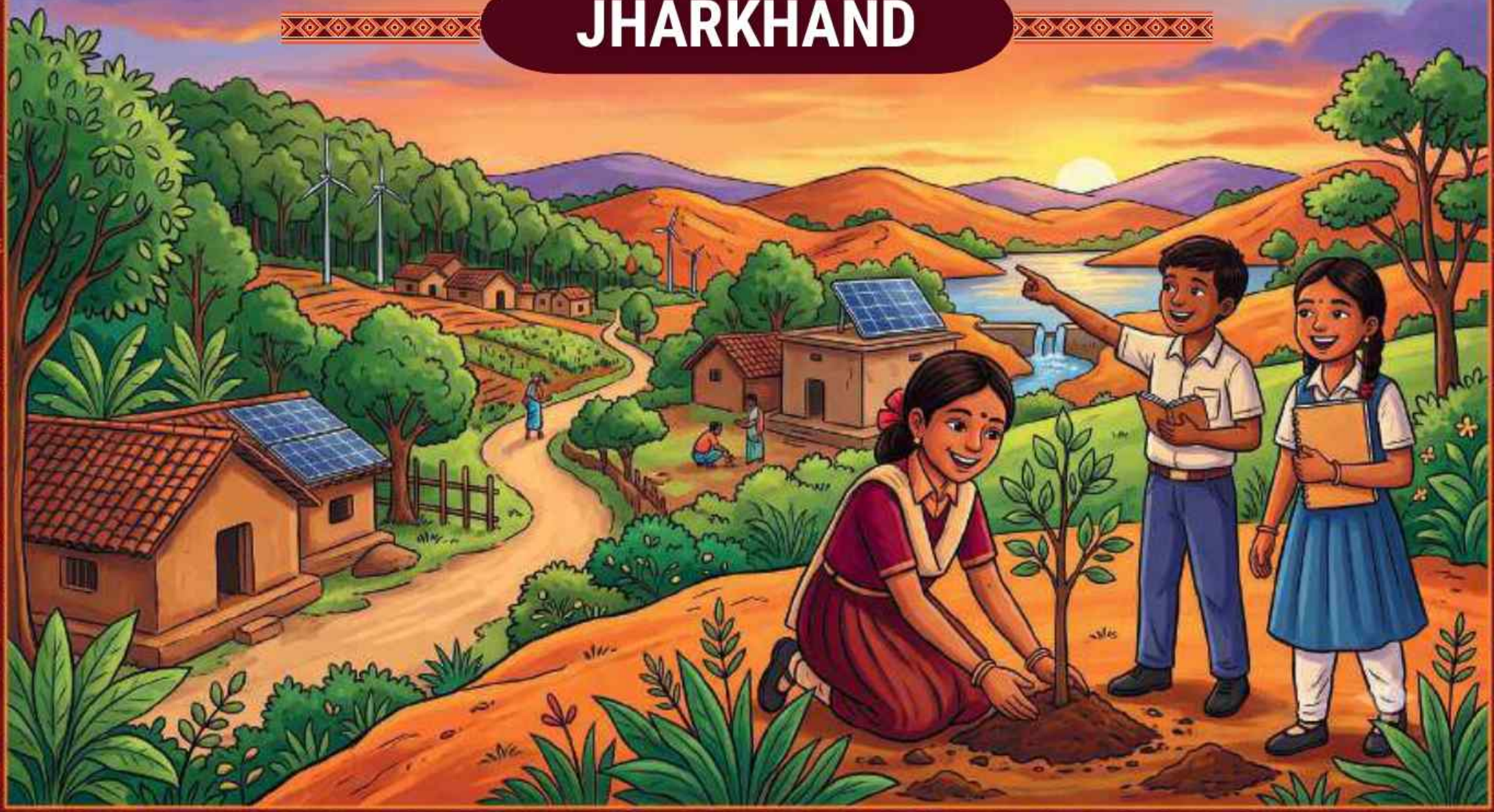
Environment and Climate Change

LEARNING PROGRAMME FOR ADOLESCENTS

JHARKHAND



Environment and Climate Change

LEARNING PROGRAMME FOR ADOLESCENTS IN JHARKHAND

A 10- month module

THE GROW FUND
Grassroots | Resilience | Ownership | Wellness

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Chapter 1: Understanding Our Environment





Chapter Overview

Have you ever wondered why **forests, ponds, farms, animals, birds, and even people** are connected to one another? Why does **cutting down trees affect rainfall?** Why do **fish disappear when ponds become polluted?**

Everything around us forms part of our environment. Understanding and protecting it is the first step towards becoming a **Green Champions.**

Story Corner

Rani, Pinky, and Aman lived in a small village near a sal forest in Jharkhand. Every morning, they crossed paddy fields and a pond to reach school.

One day, their teacher, Sunita Madam, asked the class,
"**Can anyone tell me what the environment is?**"

Many students pointed towards the trees outside.
"**It is the forest!**" shouted Aman.
"**It is the river!**" said Rani.
Sunita Madam smiled.
"The environment is much more than that. It includes everything around us—air, water, soil, plants, animals, insects, forests, rivers, and even human beings."

On their way home, Rani and Aman began noticing things they had never paid attention to before. **Butterflies flying over flowers, frogs croaking near the pond, earthworms in the soil, and cows grazing in the fields.**
They realized that all these **living and non-living things worked together like one big family.**

That evening, Aman asked his grandfather,
"Dadaji, how did people know when rain would come before mobile phones and weather forecasts?"
Grandfather smiled and replied,
"We watched the wind, clouds, ants, birds, and flowering of trees. Nature itself used to give us signals."

Rani and Aman understood that people and nature have always been deeply connected.

Think About It:

- What do you see around your home every day?
- Can people survive without air, water, soil, and plants?
- What signs of nature do elders in your village observe?

What Is Environment?

The environment means everything around us that supports life.
It includes:

Living Things:	Non-Living Things:
• Humans • Trees • Crops • Animals • Birds • Fish • Insects • Microorganisms	• Air • Water • Soil • Sunlight • Rocks • Temperature • Rainfall • Chairs/Blackboard
These are called biotic components.	**These are called abiotic components.**

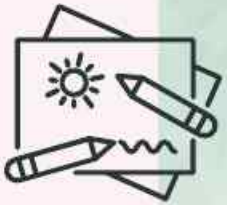
Together, living and non-living things interact with one another and form the environment.

Did You Know?

🐘 Jharkhand is home to many species of birds, animals, and plants.
🌳 Sal forests provide food, medicine, fuelwood, and shelter to many communities.
🐝 Bees help farmers by pollinating flowers, which increases crop production.
🌧️ Monsoon rainfall fills ponds and wells that people use throughout the year.

Activity 1





Draw Your Village

Take a sheet of paper and draw:

- **Your house**
- **Pond or river**
- **School**
- **Farm**
- **Forest or trees**
- **Road**
- **Temple or community place**

Mark where birds, animals, and plants are found.

Our Environment Around Us

Natural Environment	Human-made Environment
Created by nature: • Forests • Rivers • Hills • Soil • Animals • Air and water	Created by people: • Houses • Roads • Schools • Wells • Bridges • Markets
	Humans depend on nature to build these things.



How Are We Connected?

Imagine if there were no:

❌ Trees → Less oxygen and rainfall
❌ Bees → Fewer fruits and vegetables
❌ Earthworms → Poor soil
❌ Ponds → Less water for people and animals
❌ Forests → Loss of wildlife

Everything in nature is connected.

Ecosystem: Nature's Teamwork

An ecosystem is a community of living and non-living things working together.

Pond Ecosystem



Living things:	Non-living things:
• Fish • Frogs • Algae • Insects	• Water • Sunlight • Mud • Air

All depend upon one another.

Forest Ecosystem

Living things:
- Trees
- Animals
- Birds
- Insects
- Humans

Non-living things:
- Soil
- Rain
- Air
- Sunlight

If one part is disturbed, the whole ecosystem is affected.



Indigenous Wisdom

Many tribal communities in Jharkhand have protected nature for generations. They:

✓ Worship sacred groves.
✓ Celebrate Sarhul and Karma festivals.
✓ Use medicinal plants carefully.
✓ Harvest Forest products sustainably.
✓ Protect ponds and community forests.

Traditional knowledge teaches us to respect nature.

Nature Detective

Look around your surroundings and answer:

Which trees are common in your village? .....

Which birds do you see daily? .....

Where do people get water from? .....

What crops are grown nearby? .....

Which insects visit flowers? .....

Group Activity

Walk around your school or village and observe, then record your observations.

🌳 **Trees** 🦋 **Butterflies** 🐜 **Ants** 🐦 **Birds** 🐄 **Domestic animals** 💧 **Water bodies**

Fun Corner: Match the Following

Column A	Column B
Bee	Oxygen
Tree	Energy
Pond	Fertile Soil
Earthworm	Fish
Sun	Pollination



Did You Know?

A single mature tree can provide enough oxygen for several people every day.

Be a Green Champion

You can protect the environment by:

- ✅ Planting trees.
- ✅ Feeding birds during summer.
- ✅ Protecting ponds and forests.
- ✅ Respecting animals, birds, plants and insects.
- ✅ Saving water.
- ✅ Avoiding plastic litter.



Answer: Bee-Pollination, Tree-Oxygen, Pond-Fish, Earthworm-Fertile Soil, Sun-Energy

Chapter 2: Our Natural Wealth – Forests, Rivers and Communities



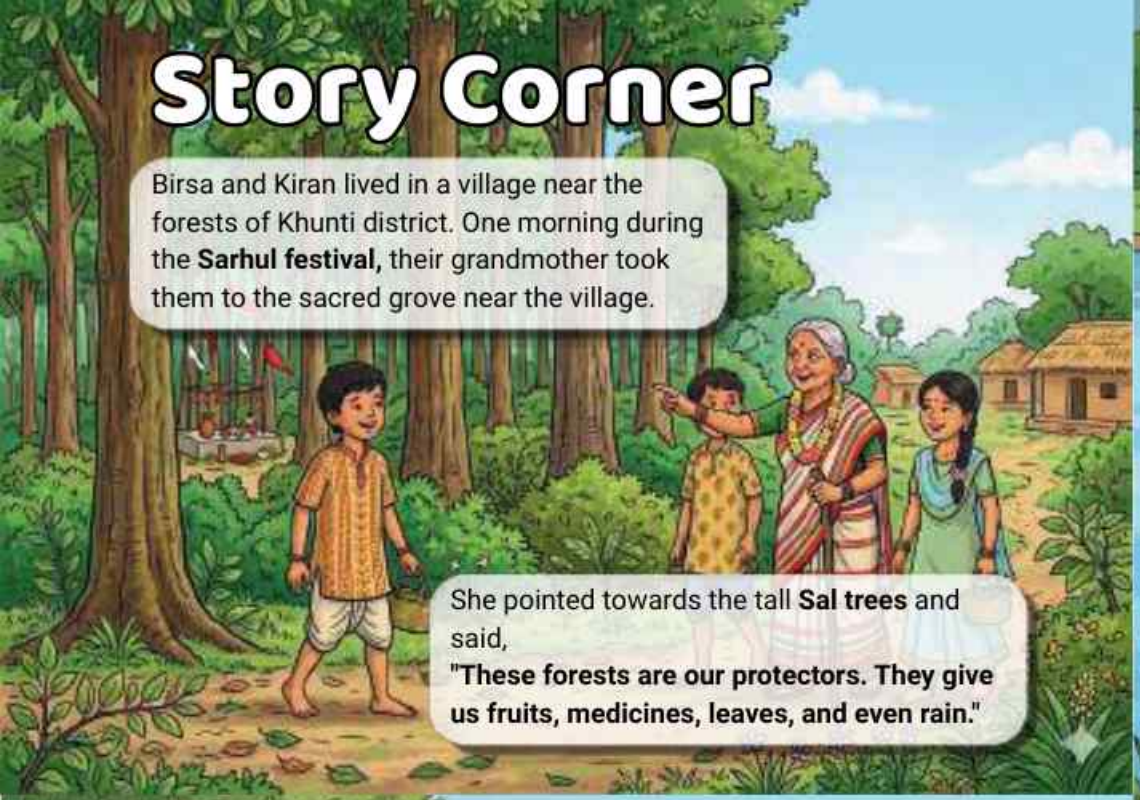


Chapter Overview

Jharkhand is known as the **"Land of Forests."** Its hills, rivers, forests, fertile lands, and rich biodiversity have supported people and wildlife for generations. **Communities** in Jharkhand have always shared a close relationship with nature. **Forests** provide food and medicines, **rivers** provide water, and the **land** supports farming and livelihoods.

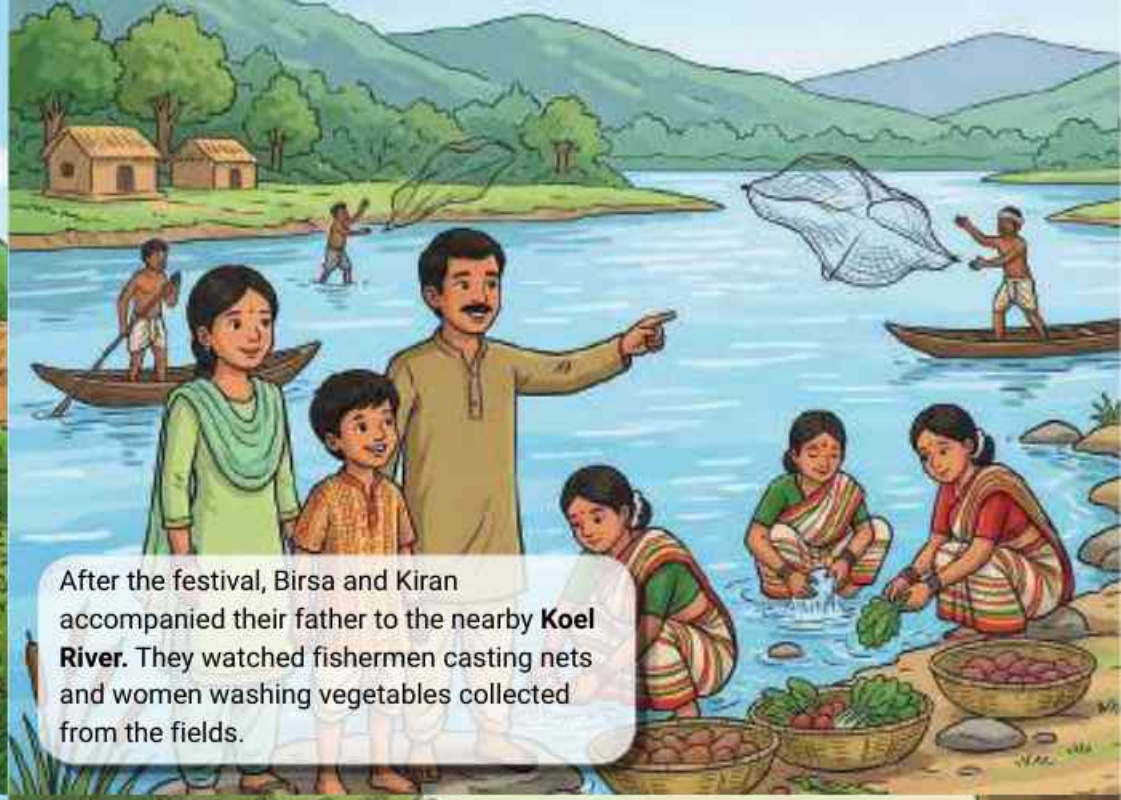
But have you ever wondered where the **Mahua flowers come from?** Why are **Sal trees so important?** Or how rivers and forests support the lives of people in villages? Let us explore the **natural wealth of Jharkhand** and understand **why protecting it is important** for our future.

Story Corner

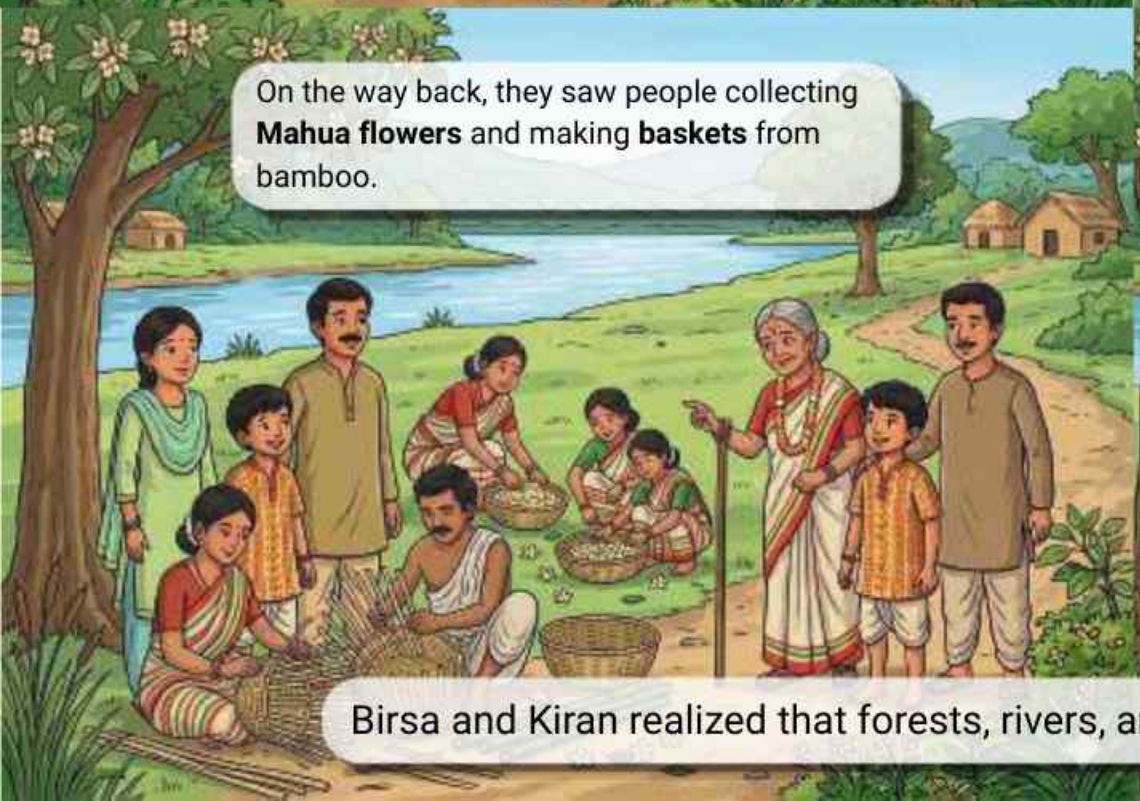


Birsa and Kiran lived in a village near the forests of Khunti district. One morning during the **Sarhul festival,** their grandmother took them to the sacred grove near the village.

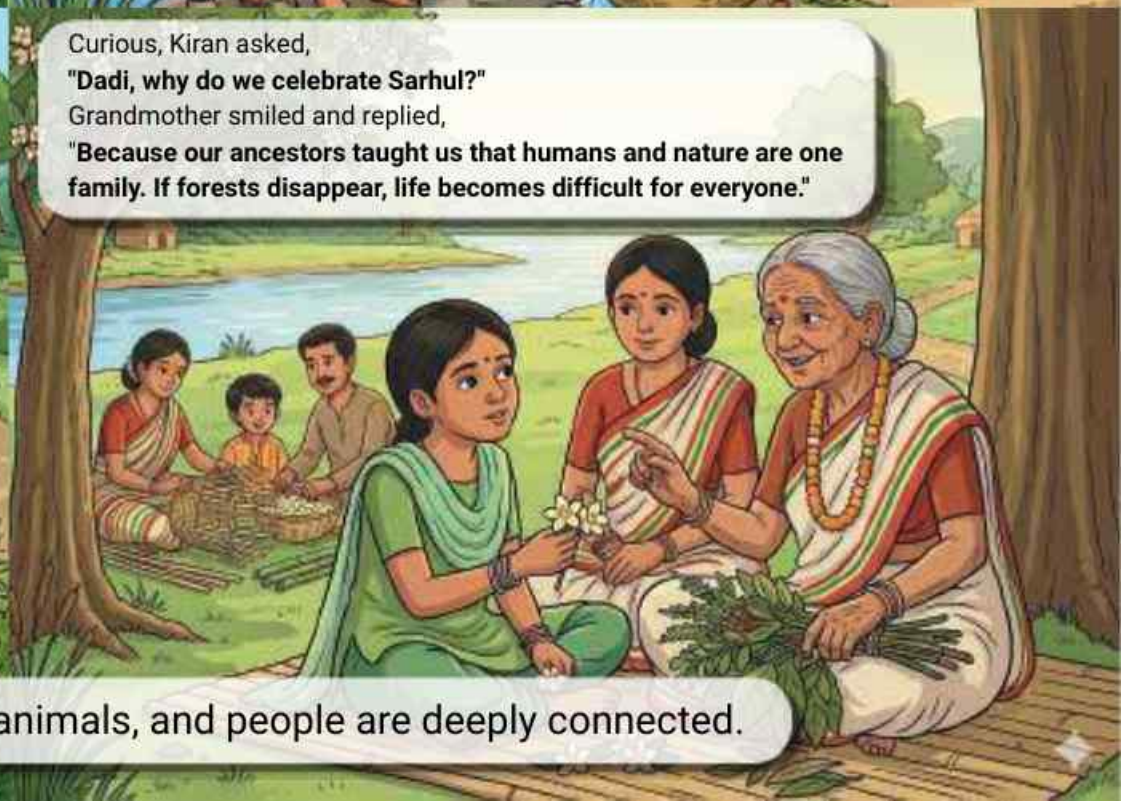
She pointed towards the tall **Sal trees** and said,
"These forests are our protectors. They give us fruits, medicines, leaves, and even rain."



After the festival, Birsa and Kiran accompanied their father to the nearby **Koel River.** They watched fishermen casting nets and women washing vegetables collected from the fields.



On the way back, they saw people collecting **Mahua flowers** and making **baskets** from bamboo.



Curious, Kiran asked,
"Dadi, why do we celebrate Sarhul?"
Grandmother smiled and replied,
"Because our ancestors taught us that humans and nature are one family. If forests disappear, life becomes difficult for everyone."

Birsa and Kiran realized that forests, rivers, animals, and people are deeply connected.

Think about it

- Which trees are common around your village?
- Where does your family get water from?
- What forest products do people collect in your community?



Forests: Jharkhand's Green Treasure

Forests are among Jharkhand's greatest natural assets.

Forests Provide:

✓ Clean air
✓ Rainfall and cool temperatures
✓ Food and fruits
✓ Fuelwood
✓ Fodder for animals
✓ Medicinal plants
✓ Habitat for wildlife
✓ Livelihoods for millions of people



Jharkhand is located in eastern India and is blessed with:

- 🏞️ Hills and plateaus
- 🌳 Dense forests
- 💧 Rivers and streams
- 🌾 Agricultural lands
- 🐘 Rich biodiversity
- ⛏️ Minerals and natural resources



Nearly one-third of the state's area is covered with forests.

Many tribal communities, including the Munda, Santhal, Ho, Oraon, and Kharia people, have lived in harmony with nature for centuries.

Common Trees Found in Jharkhand

Sal (Sakhua)

🌳 State Tree of Jharkhand

- Provides timber.
- Leaves are used to make plates and bowls.
- Important in Sarhul celebrations.

Kendu

🍃 Leaves are used for making bidi.

Bamboo

🎋 Used to make baskets, fences, and handicrafts.

Mahua

🌼 Known as the "Tree of Life"

- Flowers are eaten and used in traditional recipes.
- Seeds provide oil.

Neem

🌿 Used for medicine and natural pest control.

Tamarind and Jackfruit

🍈 Provide nutritious food and shade.







Protected Areas of Jharkhand

Betla National Park

Famous for elephants, tigers, deer, peacock

Dalma Wildlife Sanctuary

Known for elephant migration routes.

Hazaribagh Wildlife Sanctuary

Home to many birds and mammals.

Rich Biodiversity of Jharkhand

Jharkhand is home to many species of animals and birds.

Common Animals:

🐘 Elephant 🦌 Deer 🐒 Monkey
🐗 Wild boar 🐇 Hare

Common Birds

🦚 Peacock 🦜 Parrot 🦉 Owl
🐦 Mynah 🦅 Eagle

Helpful Insects

🐝 Honey bees 🦋 Butterflies
🐞 Ladybird beetles 🐜 Ants

Indigenous Wisdom and Community Traditions

For generations, communities such as the Munda, Oraon, Ho, Santhal, Kharia, and Birhor have lived closely with forests, rivers, and farmland. Their traditional practices help protect nature and ensure resources are available for future generations.

Traditional Practices that Support Nature

🌳 **Sarna and Jaherthan**

Many villages maintain sacred groves where cutting trees or hunting animals is discouraged. These places act as natural shelters for birds, insects, and medicinal plants.

🌾 **Mixed Cropping**

Farmers often grow paddy, pulses, maize, and vegetables together. This improves soil fertility and reduces the risk of crop failure.

🐄 **Livestock and Agriculture**

Cattle and goats provide manure, which enriches the soil naturally and reduces the need for chemical fertilizers.

🌿 **Traditional Medicine**

Leaves, roots, bark, and flowers of plants like Neem, Tulsi, and Harra are used to treat common ailments.

🌦️ **Reading Nature's Signs**

Elders observe the flowering of trees, movement of ants, or bird calls to predict rainfall and seasonal changes.

Discover Your District

Every district of Jharkhand has unique natural resources.

Ranchi: Waterfalls and plateau forests.
West Singhbhum: Dense forests and elephants
Dumka: Hills and tribal culture
Latehar: Betla National Park
Hazaribagh: Lakes and forests
Gumla: Traditional farming systems

Activity Box 1: My District, My Pride

In groups, find out:

✓ Name of your district
✓ Major river nearby
✓ Common crops grown
✓ Local trees found in your area
✓ One famous waterfall, hill, or forest

Present your findings in class.

Activity Box 2: Interview a Forest Friend

Talk to one person in your village:

A farmer, A Mahua collector, A forest guard, A beekeeper, A grandmother or grandfather

Ask:

1. *Which forest products were more abundant earlier?*
2. *Which birds or animals have become rare?*
3. *How have forests changed over the years?*
4. *What traditional practices helped protect nature?*

Share your findings with classmates.

Fun Corner: Can You Guess?

I bloom in summer and my flowers are collected by villagers. Who am I?

☀️ _____

I am called the Flame of the Forest because of my bright orange flowers.

🌺 _____

I am Jharkhand's state animal and often travel in herds.

🐘 _____

I am a famous national park in Latehar district.

🦌 _____

Challenge Box: Find the Odd One Out

1. Sal – Mahua – Bamboo – Plastic Bottle
2. Subarnarekha – Damodar – Koel – Arabian Sea
3. Elephant – Deer – Peacock – Motorcycle
4. Paddy – Maize – Lentils – Cement

Did You Know?

Hundru Falls near **Ranchi** is one of the **highest waterfalls** in Jharkhand.

State Symbols of Jharkhand

- 🌳 State Tree: **Sal**
- 🌺 State Flower: **Palash**
- 🐘 State Animal: **Elephant**
- 🦜 State Bird: **Asian Koel**

Think Like a Scientist

Why are Sal forests important?

Tick all that apply:

- ☐ They provide habitat for wildlife.
- ☐ They help maintain rainfall.
- ☐ They prevent soil erosion.
- ☐ They provide leaves, fuelwood, and timber.
- ☐ All of the above.

Answer: 1.Mahua, 2.Palash, 3.Elephant, 4.Betla National Park
1.Plastic Bottle, 2.Koel, 3. Motorcycle, 4. Cement
✓ All of the above

Chapter 3: Weather, Seasons and Climate

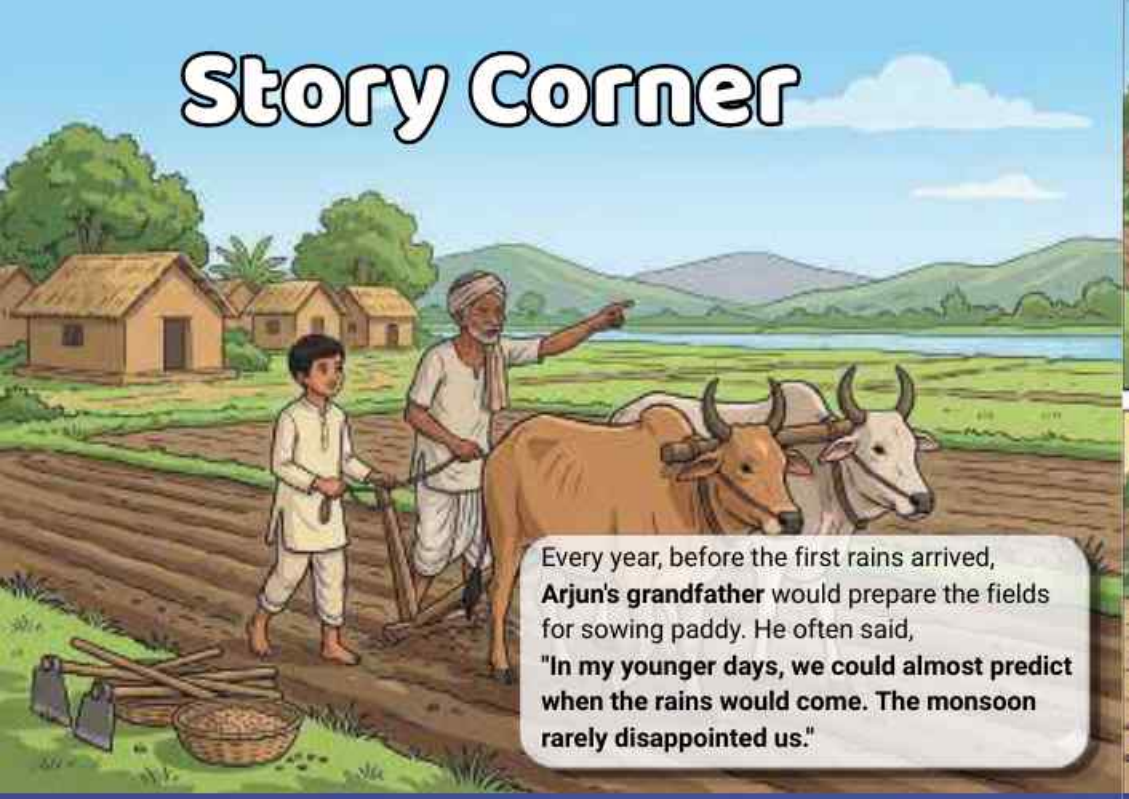


Chapter Overview

Have **summers** become **hotter** than before? Why do some years bring **heavy rains** and **floods,** while others bring **drought** and **water scarcity**? Why do farmers sometimes find it **difficult to predict** the right time for sowing crops?

People in Jharkhand have always depended on nature's cycles. Farmers, forest gatherers, and pastoral communities understand the importance of rain, seasons, and temperature. But today, these natural rhythms are **becoming less predictable**. Understanding these changes can help us **prepare better** and **protect our environment.**

Story Corner

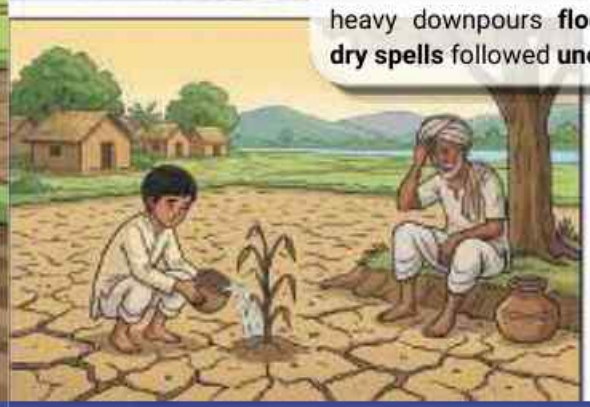


Every year, before the first rains arrived, **Arjun's grandfather** would prepare the fields for sowing paddy. He often said, **"In my younger days, we could almost predict when the rains would come. The monsoon rarely disappointed us."**

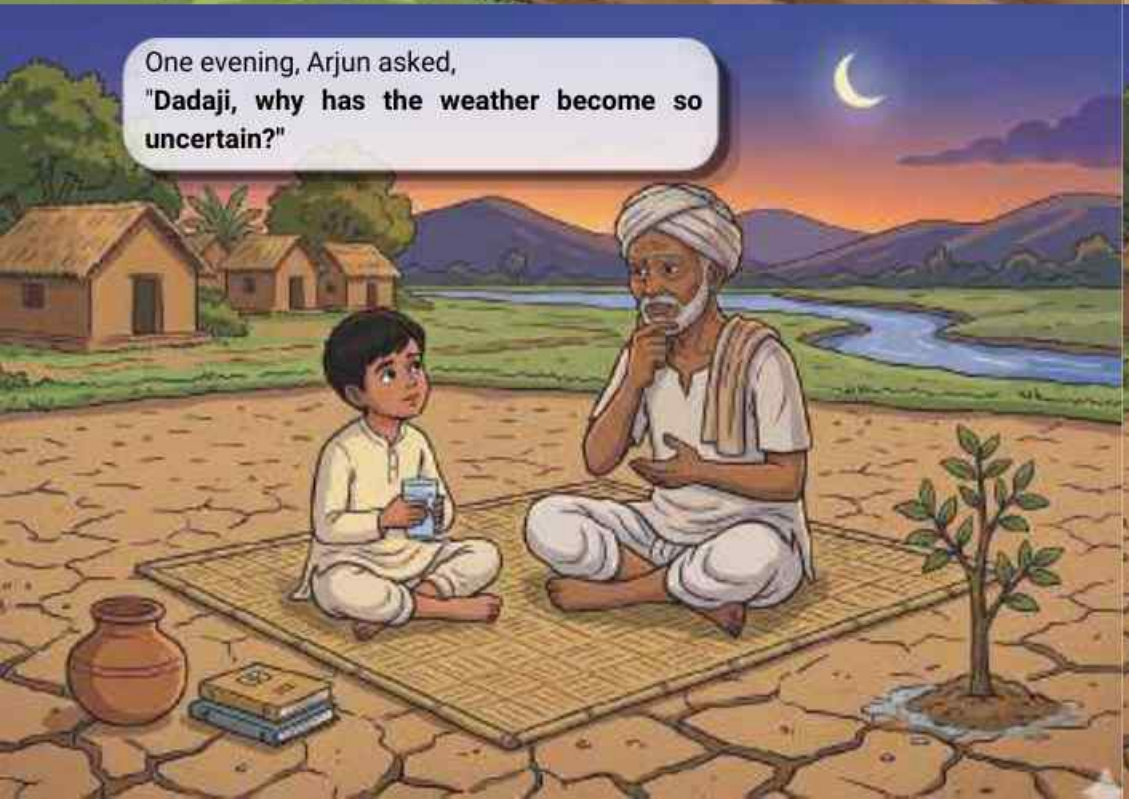




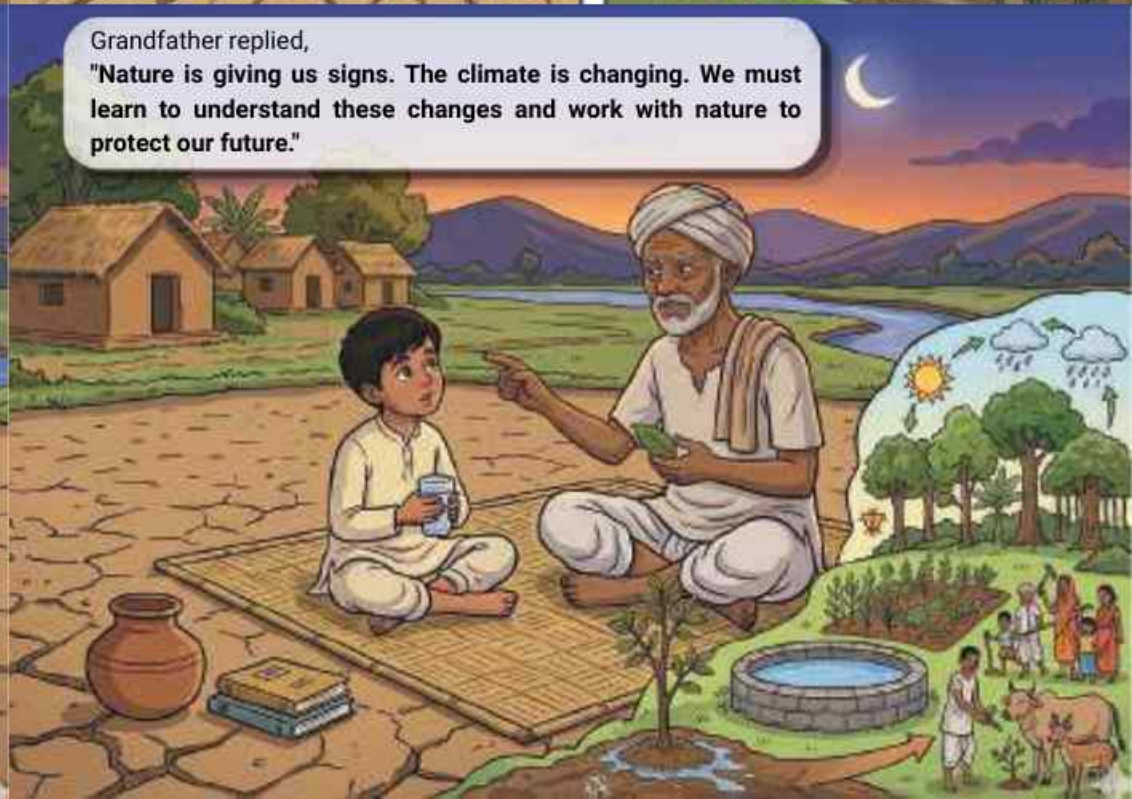
But recently, things had become different. Sometimes **rain arrived late.** Sometimes heavy downpours **flooded the fields.** Long **dry spells** followed **unexpected storms.**







One evening, Arjun asked, **"Dadaji, why has the weather become so uncertain?"**



Grandfather replied, **"Nature is giving us signs. The climate is changing. We must learn to understand these changes and work with nature to protect our future."**

Weather and Climate: Are They the Same?

Although people often use these words together, they mean different things.

Weather

Weather describes the conditions we experience over a short period.

Examples: ☀ Today's temperature

🌧 Rain this week

🌬 Wind speed

☁ Cloud cover

Weather can change from one day to another.

Climate

Climate refers to the usual pattern of weather observed over many years.

It tells us:

- When summers usually occur.
- How much rain falls during the monsoon.
- Which months are generally cooler.

Climate changes slowly, over decades.





Why is the Monsoon Important?

Almost every aspect of village life depends on rainfall. Without sufficient rainfall, farming and water availability are affected.

Monsoon supports **Agriculture**, **Drinking water sources**, **Forest growth**, **Livestock**, **Fish ponds**, **Groundwater recharge.**

Seasons in Jharkhand

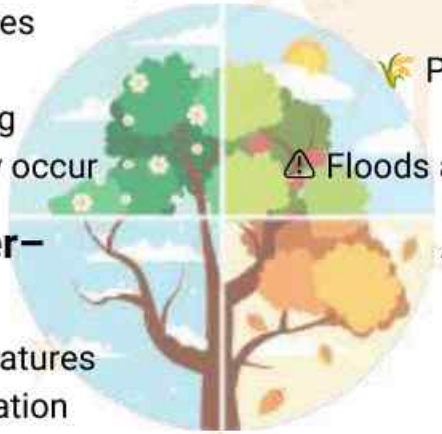
Jharkhand experiences four broad seasons.

Summer (March–June)

- ☀ High temperatures
- 💧 Dry conditions
- 🌸 Mahua flowering
- ⚠ Heat waves may occur

Monsoon (June–September)

- 🌧 Heavy rainfall
- 🌾 Paddy cultivation begins
- 💧 Rivers and ponds fill
- ⚠ Floods and waterlogging occur



Winter (December–February)

- ❄ Pleasant temperatures
- 🥬 Vegetable cultivation
- 🐦 Arrival of migratory birds

Autumn (October–November)

- 🌿 Green landscapes
- 🌾 Harvest season
- 🎉 Festivals like Sohrai

Have You Noticed These Changes?

Many communities in Jharkhand have observed:

- Hotter summers
- 🌧 Irregular rainfall
- ⚡ Sudden storms
- 🌾 Crop losses
- 🌤 Long dry periods between rains
- 💧 Drying ponds and streams
- 🐦 Changes in bird and insect populations

These are signs that the climate around us is changing.

Understanding Climate Change

Climate change refers to long-term changes in temperature, rainfall, and weather patterns. Human activities contribute to these changes by releasing greenhouse gases into the atmosphere.

Some major causes include:

- 🚗 Burning fossil fuels
- 🌳 Cutting forests
- 🔥 Open burning of waste
- 🏭 Industrial pollution
- Forest fires

These gases trap heat and make the Earth warmer.

Climate Change in Jharkhand

Heat Waves: Summer temperatures are increasing, affecting people, animals, and crops.

Changing Rainfall Patterns: Farmers are finding it difficult to predict sowing times.

Water Scarcity: Wells and ponds dry up earlier during summer.

Forest Fires: Dry conditions increase the risk of fires, affecting wildlife and forests.

Health Problems: Extreme heat can cause dehydration, heatstroke, and diseases.

Effects on Farming

Changing weather patterns may lead to:

- **Lower crop yields**
- **Increased pests and diseases**
- **Crop failures**
- **Financial difficulties for families**

Climate and Agriculture

Farmers are adapting in many ways.

Some sustainable practices include:

- 🌾 **Growing drought-resistant crops.**
- 🌱 **Practicing mixed cropping.**
- 💧 **Harvesting rainwater.**
- 🌿 **Using organic manure.**
- 🌳 **Planting trees around farms.**

These practices help communities become more resilient.

Voices from the Village

Talk to elders and ask:

Thirty years ago,

- **Did summers feel cooler?**
- **Was rainfall more predictable?**
- **Which crops were commonly grown?**
- **Were ponds fuller throughout the year?**

Compare their answers with present-day conditions.

Climate Heroes of Jharkhand

Across the state, communities are:

✓ **Reviving ponds and traditional water bodies.**

✓ **Practicing agroforestry.**

✓ **Protecting community forests.**

✓ **Growing indigenous crop varieties.**

✓ **Conserving soil and water.**

✓ **Promoting kitchen gardens.**

These efforts help communities adapt to climate change while protecting nature.



Activity Box 1 Become a Weather Observer

For one month, observe and record:

- Date
- Hot/Cool
- Rainfall
- Sunny/Cloudy
- Strong Wind?
- Anything Unusual?

Discuss:

- Which days were hottest?
- Did rainfall occur when expected?
- Were there sudden changes in weather?

Activity Box 2 Collect information from five elders.

Ask:

1. When did the monsoon usually begin earlier?
2. Has rainfall become less predictable?
3. Which crops have changed over time?
4. Have heat waves become more common?

Prepare a class chart showing their observations.



Activity Box 3 Build a Simple Rain Gauge



Materials:

Empty plastic bottle, Scale, Marker

Measure rainfall during the rainy season and compare observations with your friends.

Did You Know?

🌍 Scientists study weather every day, but climate is studied over many decades.

🌳 Trees help cool the air and reduce the impacts of climate change.

💧 Wetlands and ponds act like natural water storage systems.

🌾 Indigenous crop varieties are often better adapted to changing weather conditions.

Sustainability Corner

How Can We Reduce Climate Change?

At Home

💡 Switch off unnecessary lights.

🚲 Walk or cycle short distances.

💧 Use water carefully.

🥬 Grow vegetables in kitchen gardens.

In School

🌳 Plant native trees.

♻️ Reduce waste.

📚 Spread awareness.

🧴 Avoid single-use plastic.

In Villages

💧 Protect ponds.

🌿 Promote composting.

🌾 Encourage sustainable farming.

Avoid burning crop residues and waste.

Fun Corner
Match the Clues

Changes every day	
Pattern over many years	
Main source of water for crops	
Helps cool the Earth naturally	
Long-term rise in Earth's temperature	

Climate Quiz: True or False? ● T ● F

☐ Climate and weather mean the same thing.

☐ One rainy day indicates climate change.

☐ Trees help regulate temperature.

☐ Water conservation helps communities adapt to climate change.

☐ Sustainable farming practices can reduce climate risks.

F, F, T, T, T

Answers: Weather, Climate, Monsoon, Trees, Global Warming

Chapter 4: Climate Change – What Is Happening to Our Planet?





Chapter Overview

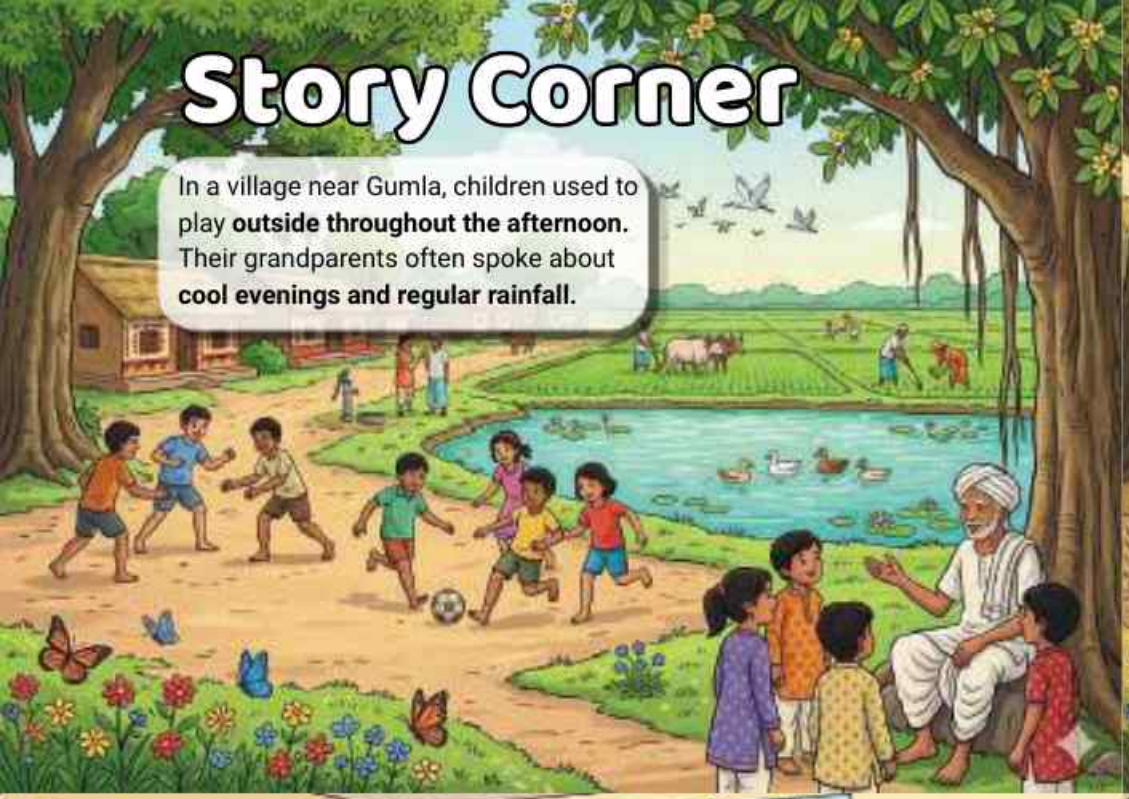
Have you noticed that **summers feel hotter than before?** Why are **glaciers melting in the Himalayas?** Why are some places experiencing **severe floods** while others face **drought?**

Scientists around the world have found that the **Earth is becoming warmer.** This warming is called **global warming**, and it is mainly caused by the buildup of certain gases in the atmosphere.

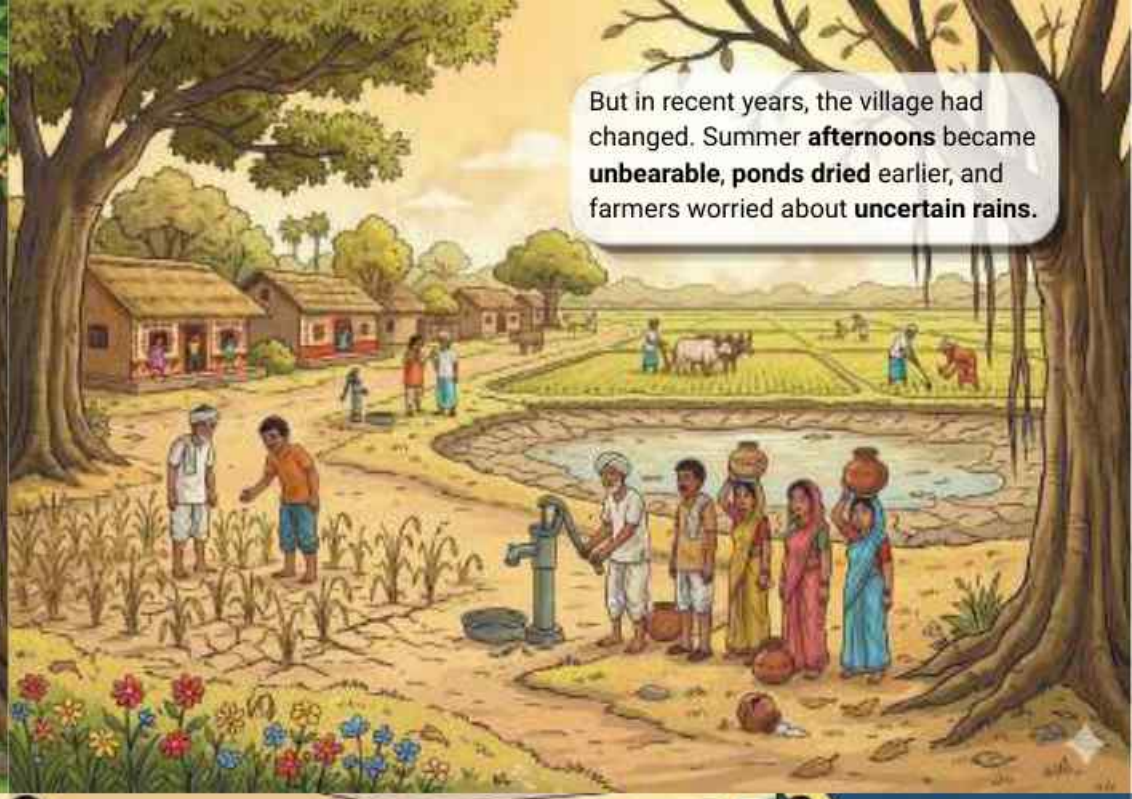
These gases act like a **blanket around the Earth**, trapping heat that would otherwise escape into space. This process is known as the greenhouse effect.

In this chapter, you will become a **Green Champion Detective** and investigate how everyday human activities contribute to climate change—and what we can do to protect our future.

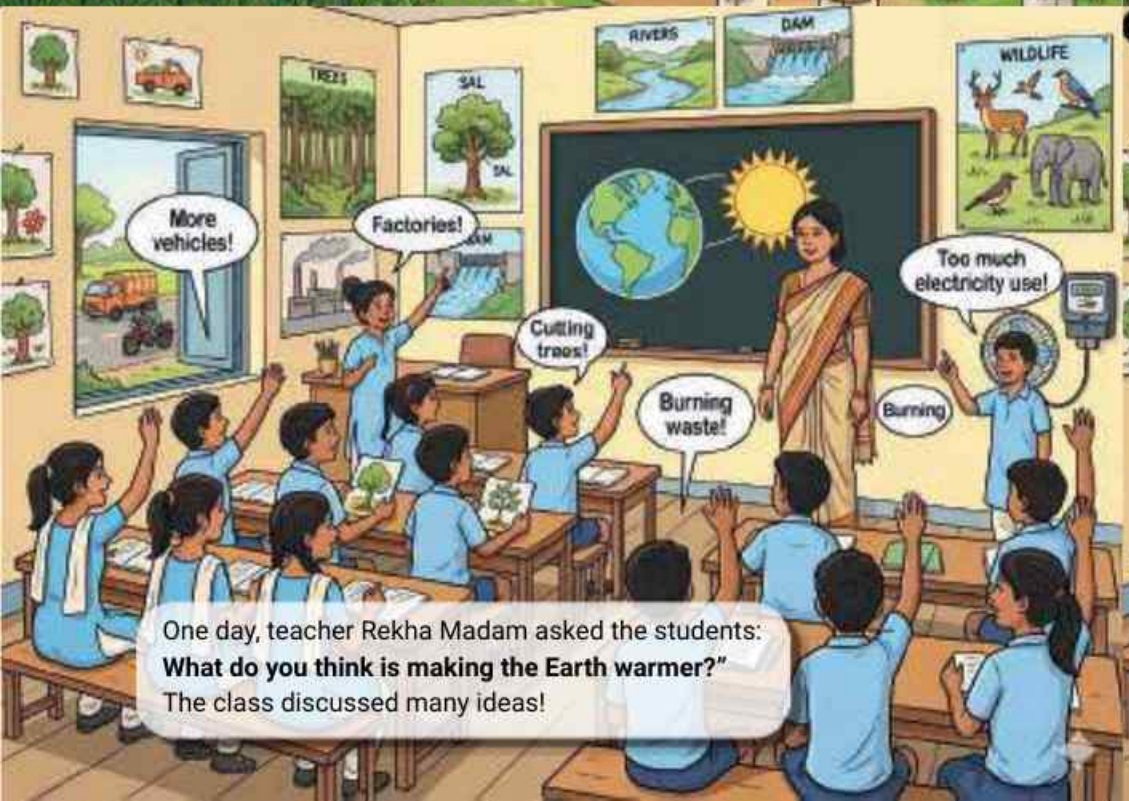
Story Corner



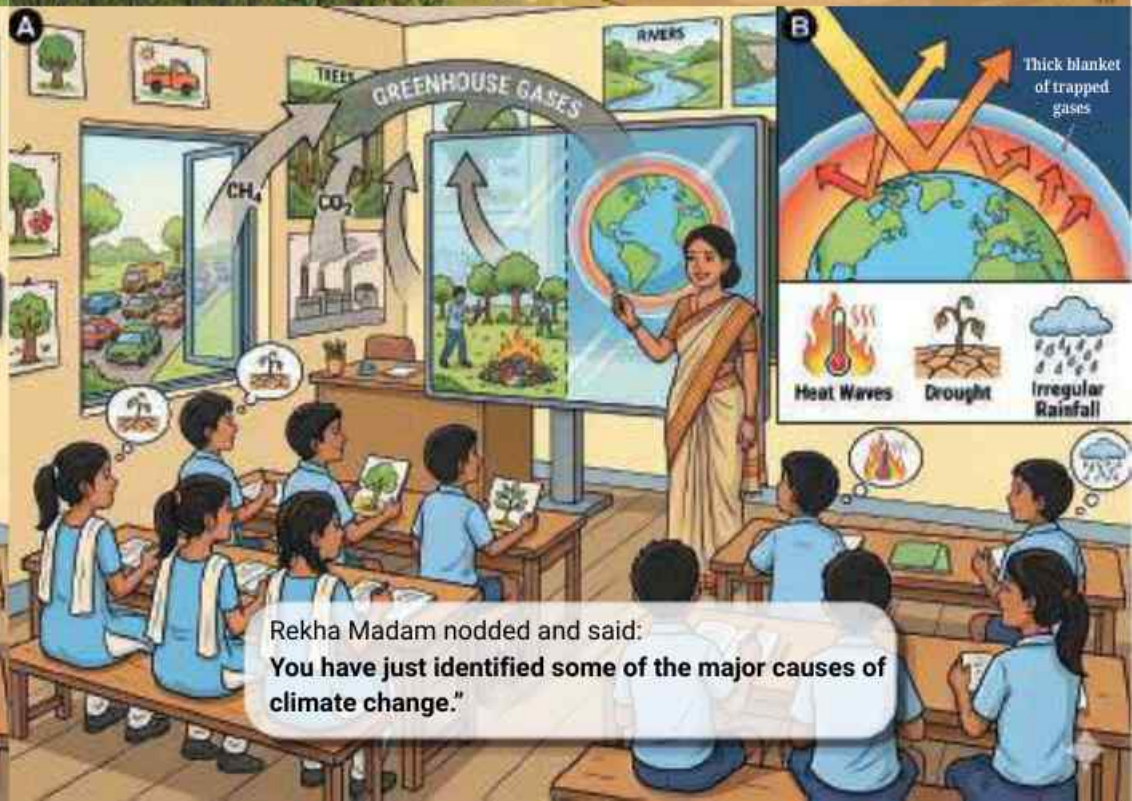
In a village near Gumla, children used to play **outside throughout the afternoon.** Their grandparents often spoke about **cool evenings and regular rainfall.**



But in recent years, the village had changed. Summer **afternoons** became **unbearable**, **ponds dried** earlier, and farmers worried about **uncertain rains.**



One day, teacher Rekha Madam asked the students: **What do you think is making the Earth warmer?"** The class discussed many ideas!



Rekha Madam nodded and said: **You have just identified some of the major causes of climate change."**

The Greenhouse Effect: Nature's Heat Blanket

Imagine sitting inside a closed car on a sunny day. The car becomes very hot because heat gets trapped inside.

Something similar happens to the Earth.

How It Works: ☀ The Sun sends energy to Earth. --- 🌍 The Earth absorbs some of this energy. --- 🌡 The Earth releases heat back into the atmosphere. --- ☁ Greenhouse gases trap part of this heat. --- Too many greenhouse gases cause extra warming.

Major Greenhouse Gases

Gas	Main Sources
Carbon dioxide (CO_2)	Burning coal, petrol, diesel, wood
Methane (CH_4)	Livestock, waste dumps, rice fields
Nitrous oxide (N_2O)	Chemical fertilizers
Other industrial gases	Factories and industrial processes



Climate Detective Month: 30-Day Challenge

Week 1: Observe Your Home

Students record:

- Number of lights used
- Hours lights remain on
- Use of fans
- Use of TV/mobile charging
- Cooking fuel used
- Waste generated

Week 2: Household Emission Calculator

Tick what your family uses:

Activity	Tick
Motorcycle	☐
Diesel pump	☐
LPG cylinder	☐
Firewood	☐
Burning waste	☐
Chemical fertilizers	☐

Week 3: Family Action Plan

Choose at least five actions:

✓ Switch off unused lights.
✓ Walk short distances.
✓ Plant trees.
✓ Compost kitchen waste.
✓ Avoid burning plastic.
✓ Save water.
✓ Use cloth bags.
✓ Reduce food waste.

Week 4: Become a Green Champion

Students can:

🎤 Give a short speech.
🎨 Make posters.
🎭 Perform a street play.
📢 Conduct a school awareness rally.
🌳 Organize a tree-planting event.







Human Activities That Increase Warming

1. Cutting Down Trees

Trees absorb carbon dioxide. When forests are cut:

❌ Less carbon is absorbed.
❌ More heat remains in the atmosphere.
❌ Soil erosion increases.
❌ Wildlife loses habitat.

2. Burning Fuels

Cars, buses, motorcycles, and generators release carbon dioxide.

Even in villages, increased fuel use contributes to warming.

3. Burning Waste

Burning plastic and other waste releases harmful gases.

These gases affect both the climate and human health.

4. Excessive Electricity Use

Much of the electricity we use is generated from fossil fuels.

Wasting electricity means more fuel must be burned.

5. Food Waste

When food is wasted:

❌ Water used to grow it is wasted.
❌ Energy used to transport it is wasted.
❌ Decomposing food releases methane.





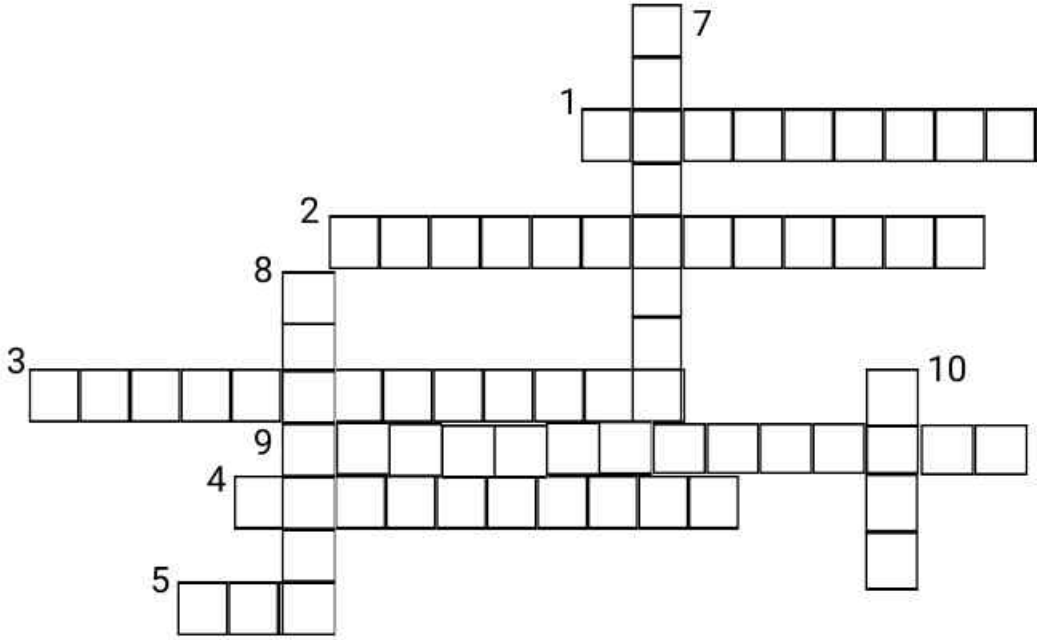
Activity Box: Carbon Footprint Hunt

Find and list how many you can find in your school, house and locality in one day:			
Purpose	**School Premise**	**Household Premise**	**Locality**
🚗 Vehicles			
Waste burning spots			
💡 Electricity use			
🌳 Areas without trees			
🏠 Cooking fuel sources			

Fun Corner: Climate Crossword

Read each clue carefully and write the correct word in the crossword grid. All the answers are related to climate change, global warming, sustainability, and protecting our planet.





Across

1. A gas released when petrol, diesel, coal, or wood is burned. It is one of the main greenhouse gases responsible for climate change.
2. The gradual increase in the Earth's average temperature due to the accumulation of greenhouse gases in the atmosphere.
3. Green plants absorb this greenhouse gas from the atmosphere during photosynthesis.
4. The process of converting kitchen waste, leaves, and other biodegradable materials into nutrient-rich manure.
5. The primary source of energy for life on Earth and a clean renewable energy source.
9. Using resources carefully so they remain available for future generations.

Down

6. A natural resource that helps absorb carbon dioxide, cools the environment, and provides habitat for wildlife.
7. A period of unusually high temperatures that can affect people, animals, and crops.
8. The seasonal rainfall that supports agriculture and water availability in Jharkhand.
10. A renewable energy source generated by moving air.

Answers: CARBONDIOXIDE, GLOBALWARMING, CARBONDIOXIDE, COMPOSTING, SUN, SUSTAINABILITY, TREE, HEATWAVE, MONSOON, WIND

Climate Sustainability Corner

What Does Sustainability Mean?

It means using resources in a way that does not harm the future.

Sustainable practices include:

- 🌳 Planting native trees
- 💧 Harvesting rainwater
- 🌾 Using organic manure
- ♻️ Recycling materials
- ☀️ Using solar energy
- 🚶 Walking or cycling

Activity Box: Build a Mini Greenhouse



- Materials:
- Two jars
- Thermometer
- Plastic wrap
- Sunlight

Observe which jar becomes warmer and discuss why heat gets trapped.





Reflection Exercise

Complete these sentences:

The biggest source of emissions in my community is

_____.

My family can reduce emissions by

_____.

I will personally take the action

_____.

The most important thing I learned is

_____.



Can you name some of them:

Three types of Sustainable Energy

_____.

What are harmful human practices that cause climate change

_____.

Chapter 5: Climate Change in Jharkhand – What Do We See Around Us?





Chapter Overview

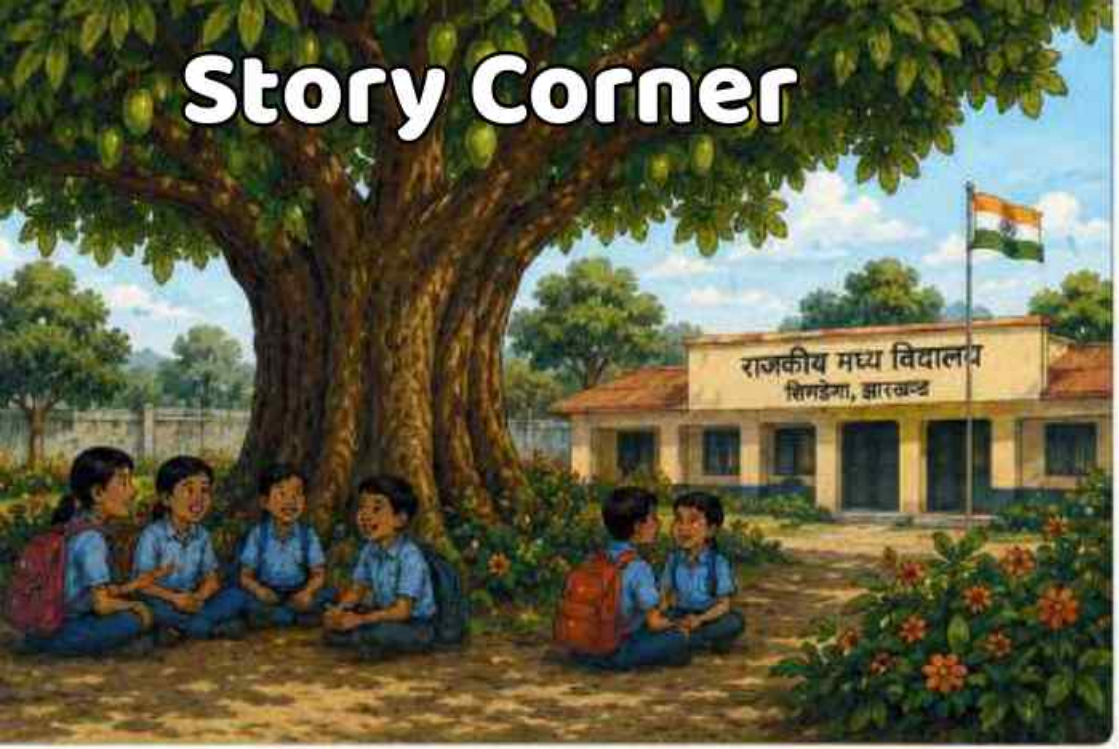
Climate change is no longer something that is happening only in distant places—**it is affecting villages, farms, forests, rivers, and families across Jharkhand.**

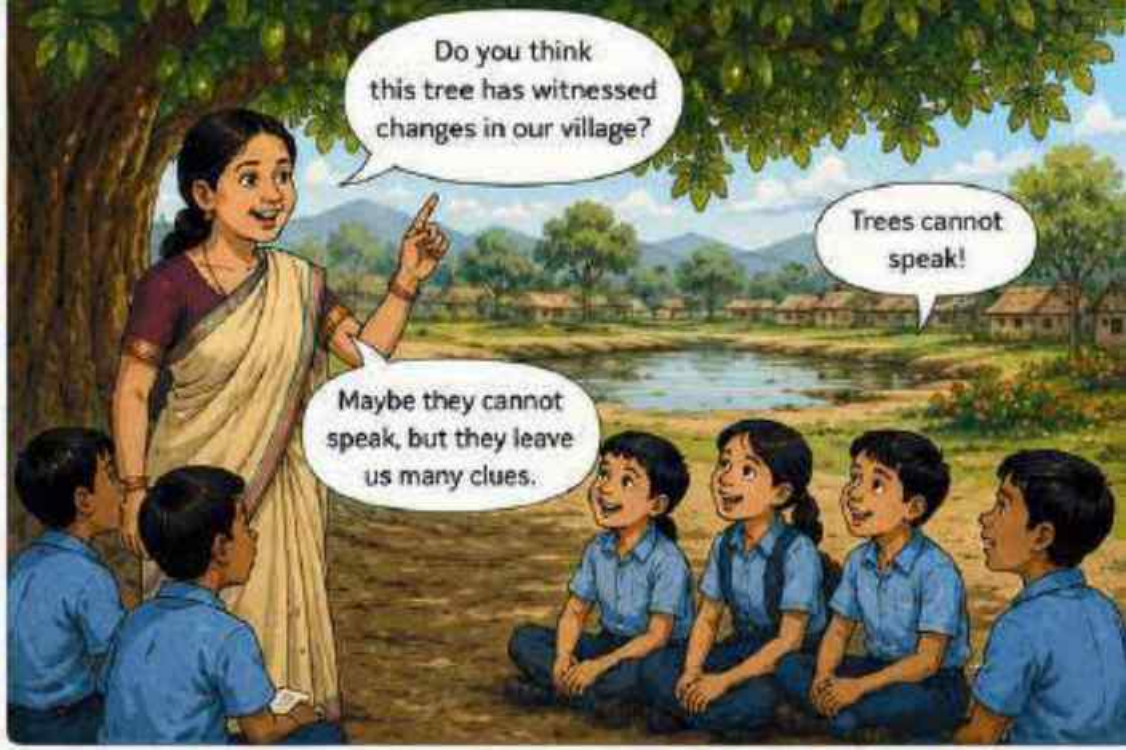
Many people have begun to notice changes in their surroundings. Summers are becoming hotter, some rivers and ponds dry up earlier than before, while heavy rains sometimes arrive suddenly and cause floods. Farmers often say that it is becoming more difficult to decide when to sow crops because the seasons are no longer as predictable as they once were.

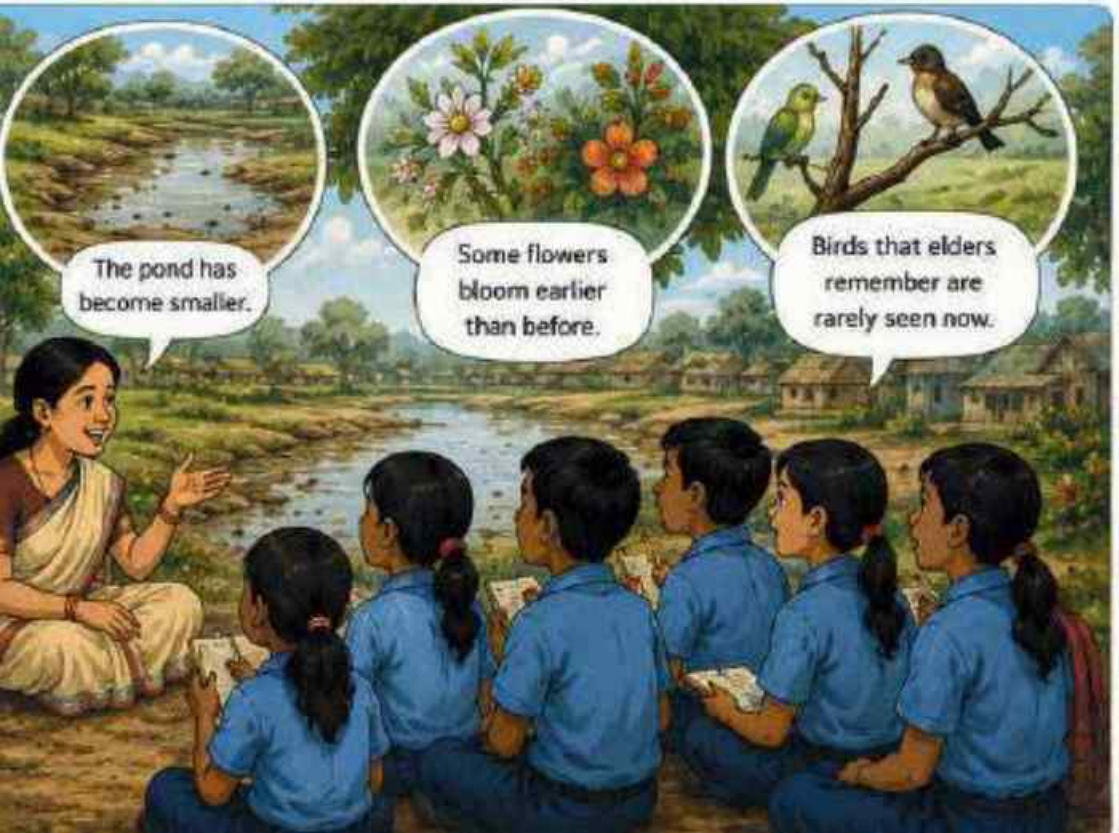
These changes affect not only agriculture but also drinking water, forests, wildlife, health, and livelihoods.

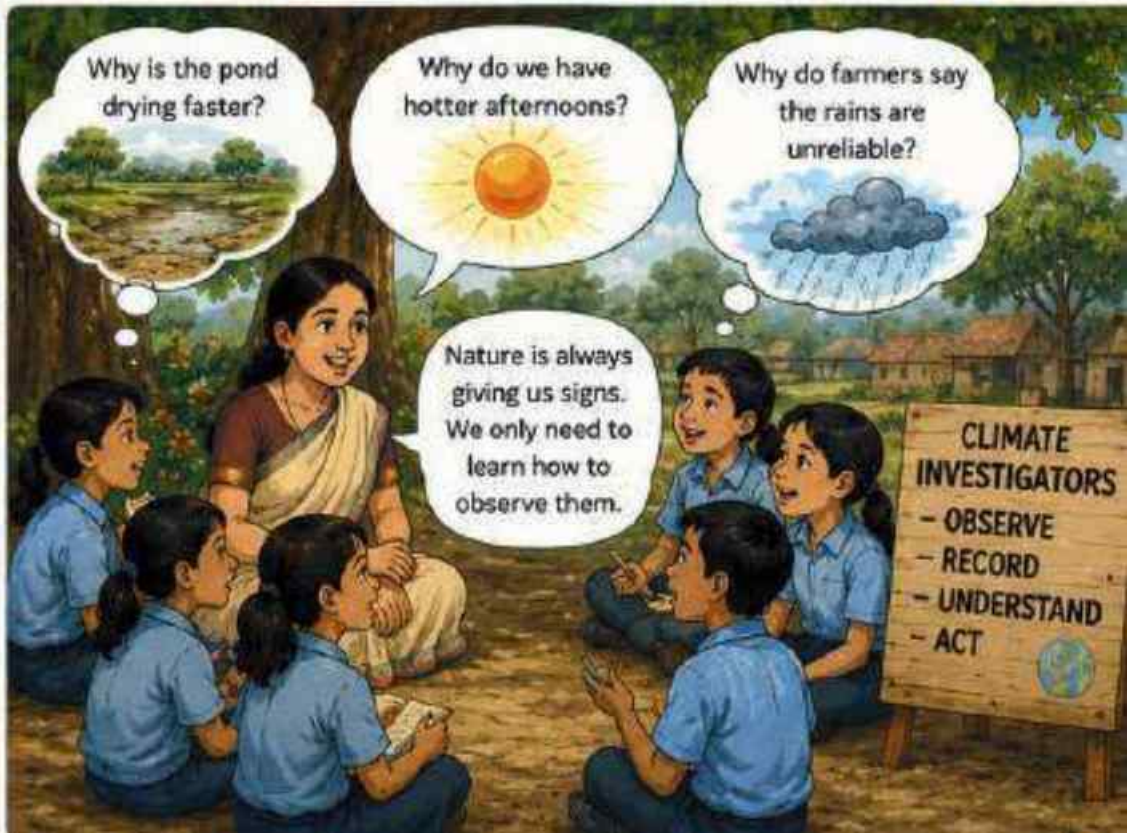
In this chapter, you will become a **Green Climate Investigator,** collecting evidence from your own village to understand how the environment has changed over the last few decades and how communities are adapting to these changes.

Story Corner









Looking for Signs Around Us

Climate change does not always happen suddenly. Sometimes the changes are small and gradual. When we observe them over many years, we begin to notice patterns.

Look around your village. Have you noticed any of these? (Tick the boxes)

- □ Hot afternoons lasting longer
- □ Crops damaged by unexpected weather
- □ New insects attacking crops
- □ Wells drying earlier
- □ Fewer butterflies or birds
- □ Strong winds before the rainy season
- □ Sudden heavy rainfall
- □ Forest fires during summer



Heat Waves: When Summer Becomes Dangerous

A heat wave is a period of unusually high temperatures lasting several days. In recent years, many parts of Jharkhand have experienced more frequent and intense heat waves.

How do heat waves affect people?

- Dehydration
- Heat exhaustion
- Difficulty working outdoors
- Reduced school attendance
- Greater risk for elderly people and young children

How do they affect nature?

- Dry ponds and streams
- Forest fires
- Water shortage for animals
- Stress on crops

Rain That Doesn't Follow the Calendar

For generations, farmers depended on seasonal rainfall to decide when to prepare fields and sow seeds.

Today, rainfall may arrive:

- Later than expected
- Earlier than usual
- In short but very intense bursts
- With long dry periods in between

This makes farming much more difficult.

Drought: When Water Becomes Scarce

A drought occurs when rainfall remains below normal for a long period.

During drought:

💧 Wells dry up.

🌾 Crops fail.

🐄 Livestock struggle to find water.

🌳 Young trees may die.

Families often need to travel farther to collect drinking water.

Floods: When Too Much Water Arrives Too Quickly

Heavy rainfall over a short period can cause rivers and streams to overflow.

Floods may:

1. Damage homes
2. Wash away crops
3. Pollute drinking water
4. Increase the spread of diseases

Both droughts and floods can happen in different parts of Jharkhand, sometimes within the same year.

Climate Change and Farming

Farmers are among the first to notice climate change.

Some changes they report include:

🌾 Delayed sowing of paddy
🐛 More insect attacks
🌧️ Difficulty predicting rainfall
🌱 Reduced crop yields
🌿 Greater need to conserve soil moisture

Many farmers are now trying new methods such as mixed cropping, water harvesting, kitchen gardens, and growing traditional crop varieties.

Climate Change and Health

Changes in climate can affect our health in many ways.

During hotter summers:

☀️ Heatstroke
💧 Dehydration
😴 Fatigue

After heavy rainfall:

🦟 Increase in mosquitoes
🤒 Water-borne diseases
🚱 Contaminated drinking water

During drought:

🥣 Food shortages
💧 Lack of safe drinking water

Activity 1: Climate Detective Interview

Objective: Learn from people who have lived in your village for many years.

Interview:

- One farmer
- One grandparent
- One village elder

Ask these questions & Record their responses in a notebook.

1. What was summer like when you were a child?
2. Has rainfall changed over the years?
3. Which crops were commonly grown earlier?
4. Have ponds, wells, or rivers changed?
5. Which birds or animals were more common before?
6. What worries you most about climate change?

How Wildlife Is Responding

Animals and birds also respond to changing weather.

Some changes people have noticed include:

🐦 Birds arriving at different times of the year.
🐝 Fewer pollinating insects in some areas.
🐘 Wild animals moving closer to villages in search of water.
🦋 Changes in butterfly populations.

Activity 2: Village Climate Timeline



Create a timeline with your classmates.

Mark important environmental events remembered by villagers. Ask your teacher to help prepare the timeline.

Year	Event

Activity 3: Then and Now



Draw two pictures:

Picture 1- My locality according to my elders. Picture 2- My Village Today

Compare: Trees, Water sources, Crops, Weather, Wildlife.

Discuss what has changed.

Activity 5: Crop Calendar Investigation



Ask local farmers:

- Which crops are grown in each season?
- Has the sowing time changed?
- Which crops grow better today than before?
- Which crops have become difficult to cultivate?

Prepare a seasonal crop calendar.

Activity 4: Nature Observation Calendar (30 Days)

Observe your surroundings every day for one month. Record:

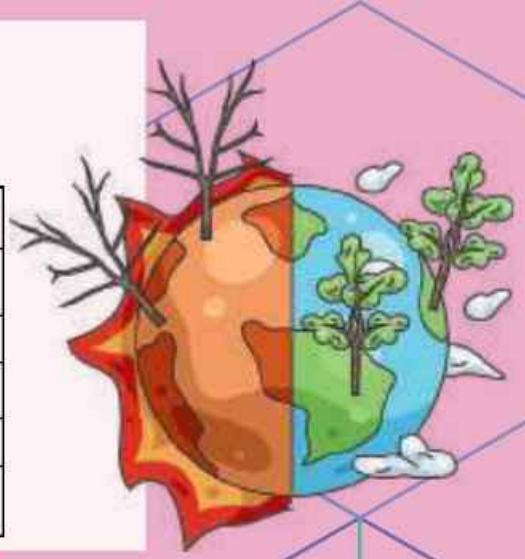
Date	Temperature Feeling	Rain	Wind	Birds Seen	Water Level in Pond	Notes

Climate Change Bingo

Your teacher will read different situations. Discuss your answers together.

Tick the correct box.

Situation	Heat Wave	Drought	Flood	Wells dry up
Wells dry up				
River overflows				
Temperature remains above normal				
Paddy field remains underwater				
Animals search for water				



Role Play: Village Meeting



Imagine your village is facing irregular rainfall.

Form groups.

Each student becomes:

Farmer Forest Guard School Student Doctor Village Head Women's Self-Help Group Member

Discuss:

"What should our village do to prepare for climate change?" Present your solutions to the class.

Role Play: Village Meeting

Look at a picture of a village (provided by your teacher or in the booklet).

Circle everything that could be a sign of climate change.

Examples:

☀️ Cracked soil Forest fire

💧 Dry pond 🌳 Dead tree

🌾 Damaged crops 🐦 Missing birds

🦟 Mosquitoes near stagnant water

Monthly Climate Investigation Project

My Village Climate Report

During the next four weeks, collect information from your family and community.

Include:

- Three interviews
- One climate timeline
- One crop calendar
- One weather observation chart
- One drawing showing environmental change
- One page describing how your family is adapting

Present your report during a "Climate Day" at school.

Chapter 6: Water Conservation and Water Security



Chapter Overview

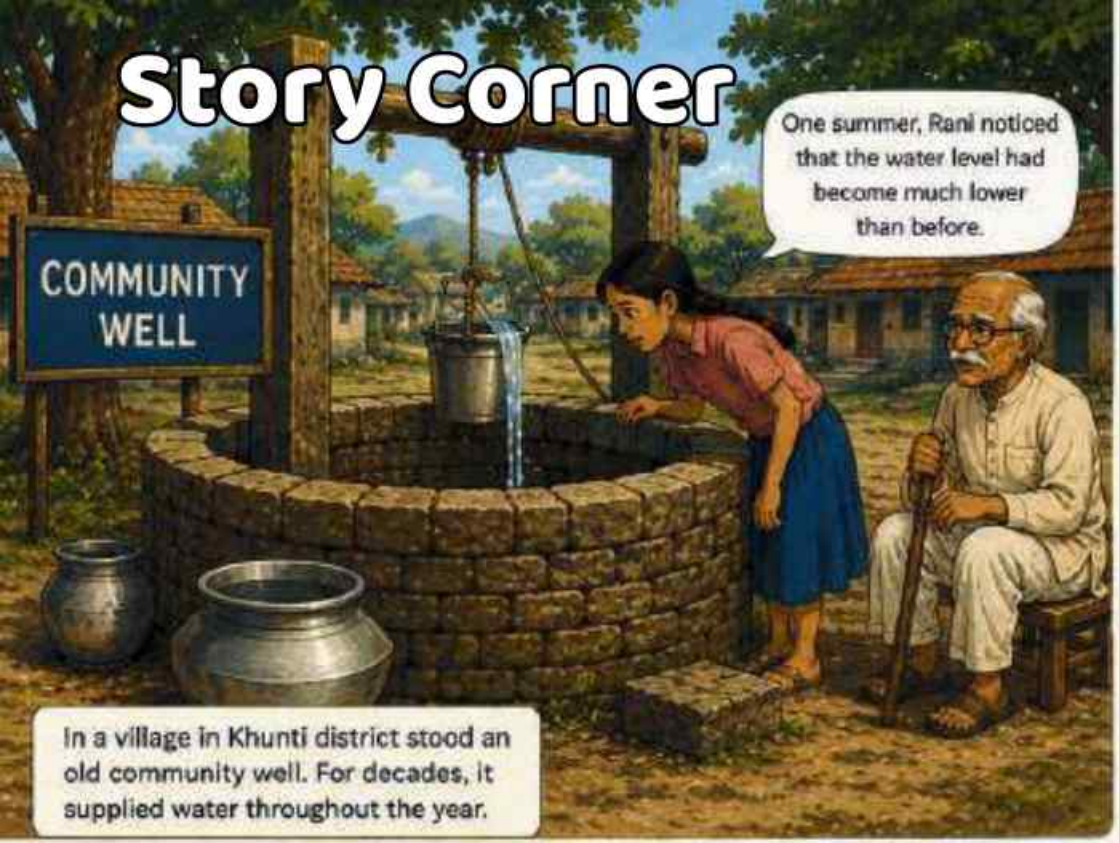
Imagine waking up one morning and finding that the hand pump in your village has **stopped giving water**. The pond is almost **dry**, the nearby stream has only a trickle of water, and farmers are worried about their crops.

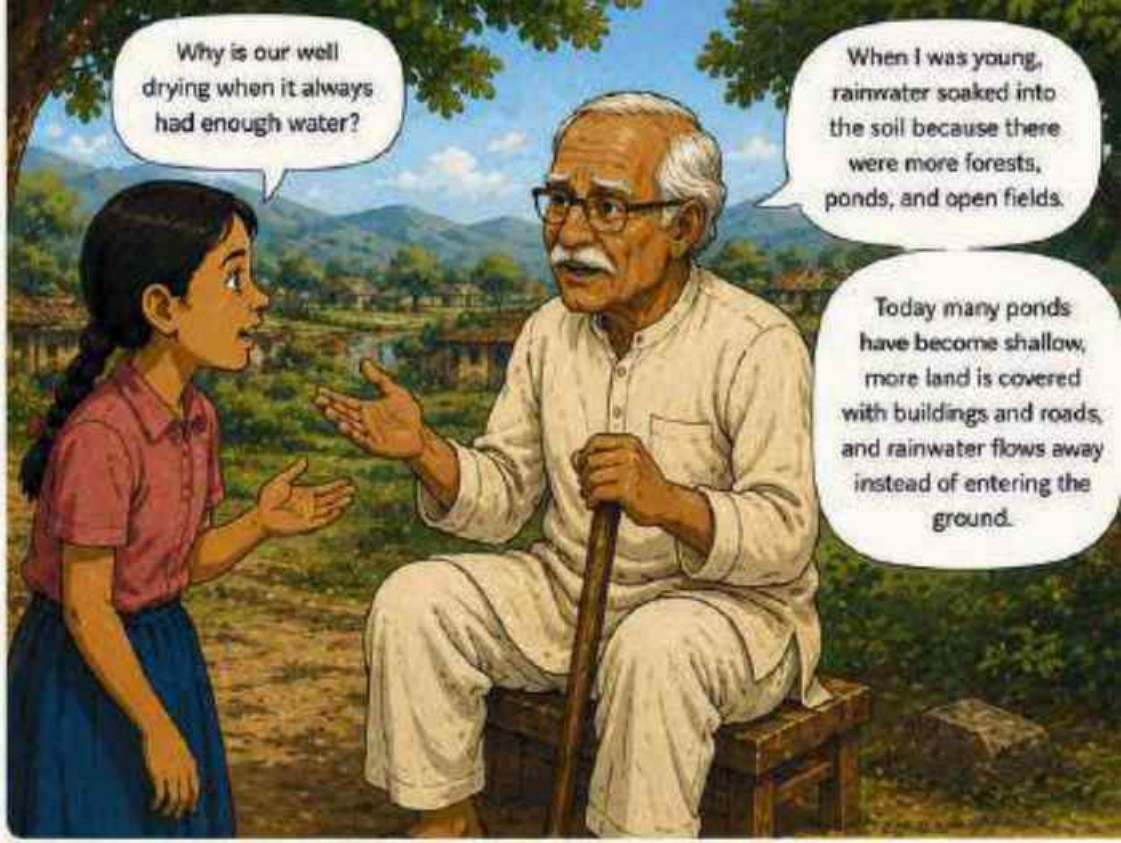
Water is one of **Earth's most precious resources**. Every person, plant, and animal depends on it for survival. Although our planet looks blue from space because of its vast oceans, only a very small portion of Earth's water is **fresh** and available for **drinking** and daily use.

In Jharkhand, water supports farming, forests, livestock, industries, and households. However, increasing temperatures, changing rainfall patterns, population growth, and careless use of water are placing greater pressure on this valuable resource.

In this chapter, you will become a **Water Guardian**, learning how water moves through nature, how it reaches our homes and fields, why groundwater is important, and how each family can help protect this precious resource.

Story Corner









Why Is Water Important?

Water is needed every day for:

💧 Drinking 🍚 Cooking
🚿 Bathing 🌾 Growing crops
🐟 Fish farming
🐄 Caring for livestock
🌳 Supporting forests and wildlife
🏥 Maintaining health and hygiene

Without safe water, communities cannot remain healthy or productive.

Where Does Our Water Come From?

In Jharkhand, villages obtain water from many sources.

Surface Water

- Rivers
- Streams
- Lakes
- Ponds
- Reservoirs

Groundwater

Water stored beneath the Earth's surface in rocks and soil.

It is accessed through:

Wells, Hand pumps, Borewells

Groundwater is especially important during dry months.

The Journey of Water: Understanding the Water Cycle

Water is always moving through nature.

The four main stages are:

☀️ **Evaporation** – Heat from the Sun changes water into water vapour.

☁️ **Condensation** – Water vapour cools and forms clouds.

🌧️ **Precipitation** – Water falls as rain.

⬇️ **Infiltration** – Some rainwater seeps into the ground and replenishes groundwater.

This natural cycle provides fresh water again and again—but only if we protect it.

Why Is Groundwater So Important?

Groundwater is often called our hidden water reserve. It supplies water even when rivers shrink or ponds dry.

However, groundwater can decrease when:

- **Rainwater cannot soak into the soil.**
- **Too much water is pumped out.**
- **Forest cover is reduced.**
- **Wetlands disappear.**

Protecting groundwater today means securing water for tomorrow.

Water Challenges in Jharkhand

Many villages face different water-related challenges.

These include:

💧 **Falling groundwater levels**
🌞 **Longer dry periods**
🌧️ **Short spells of intense rainfall**
🫙 **Pollution of ponds and streams**
🏞️ **Soil erosion filling ponds with silt**
🚰 **Unequal access to clean drinking water**

These challenges become more serious as the climate changes.

Climate Change and Water

Climate change affects the entire water cycle.

Communities may experience:

- **Delayed monsoon**
- **Heavy rainfall within a few days instead of over several weeks**
- **Longer dry periods**
- **Reduced groundwater recharge**
- **Increased demand for irrigation**
- **Water shortages during summer**

Learning to manage water wisely helps communities become more resilient.

Traditional Water Wisdom

For generations, communities in Jharkhand have developed simple ways to conserve water.

Examples include:

🌿 **Protecting village ponds**

🌾 **Building field bunds to slow rainwater**

🌳 **Conserving forests around water sources**

Small check dams across seasonal streams

🌱 **Planting grasses along field boundaries to reduce soil erosion**

Many villages are now reviving these traditional practices alongside modern water conservation methods.

Water Conservation at Home

Small habits can save thousands of litres of water every year.

Try these practices:

✔️ **Turn off taps while brushing teeth.**

✔️ **Use only the water you need.**

✔️ **Repair leaking taps.**

✔️ **Reuse water from washing vegetables to water plants.**

✔️ **Collect rainwater for gardening.**

✔️ **Wash bicycles and tools using a bucket instead of running water.**

Water Conservation in Schools

Students can help by:

💧 **Reporting leaking taps.**

🌳 **Watering plants in the morning or evening.**

🧹 **Keeping school ponds and drains clean.**

📢 **Organising water awareness campaigns.**

📋 **Monitoring daily water use.**

Activity 1: My Water Map

Draw a map of your village showing:

✓ **Wells**

✓ **Hand pumps**

✓ **Ponds**

✓ **Rivers or streams**

✓ **Water tanks**

✓ **Areas where water becomes scarce**

Discuss:

Which water sources are clean?

Which need protection?

Activity 2: Household Water Survey (30-Day Project)

Visit your home and record how water is used.

Activity	Number of Buckets/Litres Used
Drinking	
Cooking	
Bathing	
Washing Clothes	
Cleaning Utensils	
Livestock	
Gardening	

At the end of one week:

- Which activity uses the most water?
- Which activities can save water?
- Share your findings with your family.

Activity 3: Leak Detective Challenge

For one week, inspect:

- Home
- School
- Community

Tick if you observe:

□ Leaking tap
□ Overflowing water tank
□ Broken hand pump
□ Running tap left open
□ Wasted drinking water

Write one solution for each problem.

Activity 4: Build a Rainwater Collector (Model)

Working in groups, prepare a simple model showing how rainwater from a roof can be collected into a storage tank.

Use:

- Cardboard
- Plastic bottle
- Straws
- Clay
- Chart paper

Present your model to the class.

Activity 5: Design a Water-Saving Campaign

Work in groups. Create:

- A slogan
- A poster
- A street play
- A village announcement
- A short poem

Choose one message to present during the school assembly.

Activity 6: Water Use Audit

Observe your classroom for five days and record:

Observation	Mon	Tue	Wed	Thur	Fri	Sat
Tap left open						
Water spilled						
Bucket completely used						
Plants watered						

Discuss ways to reduce water wastage.

Game Time: Water Relay

Materials: Two buckets, One mug per team, Empty container

How to Play: Each team must transfer water from one bucket to another using only a mug. The goal is not to finish first. The winning team is the one that transfers the most water with the least wastage.

Discussion: 1. How much water was lost? 2. What does this teach us about everyday water use?

Fun Corner: Water Word Search

Find these words hidden in the puzzle.

RAIN, RIVER, POND, WELL, GROUNDWATER, CONSERVATION, MONSOON, FILTER, RECHARGE, STREAM

A B G F R T N F G T Y H J K I L O R A I N J H Y M
R I V E R T Y U F U I K N G N K O I U R I V R E H H
G Y T U I O K M N H Y T G H J F I L T E R K N O O
R K I O L P N H M J K L B G N H C D F R T S H Y
O U J H G T Y R E W S D R X R E C H A R G E F T
U O P P O N D F C V G H K J G J C D F O D S U I
N I K L O H G T F R E D S W A B H U Y N I F R T G
D J I K M O N S O O N U I U K W E L L G H U U U I
W K O L P D K O L G G G U Y J I F I L T E R K O P
A T Y H U J K I O F I C O N S E R V A T I O N U K
T F R E D W A Q S R T Y U I O P L H N G H Y T F
E G N M B V C X Z A S D F G H J K K L L P O I H
R H J U Y T R S T R E A M F G H J K L M N B V I

Puzzle: Where Does the Water Go?

Match each action with its result.

Action	Result
1. Planting trees	A. Cleaner groundwater
2. Rainwater harvesting	B. More water stored underground
3. Repairing leaks	C. Less water wasted
4. Cleaning ponds	D. Better water quality
5. Protecting forests	E. More rainfall infiltration

Monthly Family Challenge ✓

Become a Water Guardian: For one month, complete as many actions as possible. Ask a family member to sign your chart each week.

Action	Week 1	Week 2	Week 3	Week 4
Closed taps properly				
Saved leftover water				
Reported a leaking tap				
Watered plants wisely				
Shared water-saving tips				

Complete the sentences.

Water is important because _____.

The biggest water problem in my village is _____.

One change my family can make is _____.

As a Water Guardian, I promise to _____.

Chapter 7: Forests, Biodiversity and Wildlife Protection





Chapter Overview

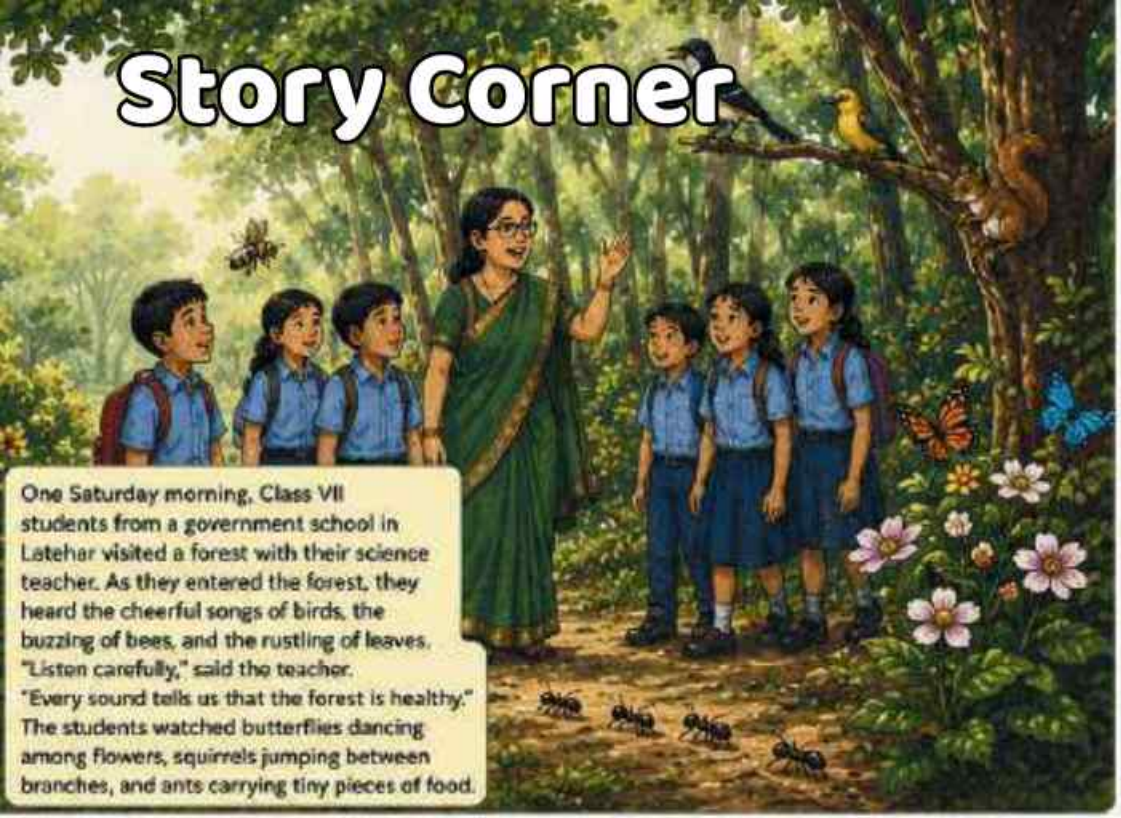
Imagine walking into a **forest** early in the morning. The air feels cool, birds are calling from the **trees, butterflies flutter among flowers, ants march across the ground, and sunlight filters through the leaves**. At first glance, these may seem like separate parts of nature—but they are all connected. Every forest is a living community where plants, animals, insects, fungi, and tiny microorganisms depend on one another. This amazing variety of life is called biodiversity.

Jharkhand is one of **India's richest states** in terms of forests and wildlife. Its Sal forests, rivers, grasslands, and hills support elephants, leopards, bears, birds, butterflies, reptiles, and thousands of plant species. These living organisms not only make nature beautiful but also provide us with clean air, fresh water, healthy soil, food, medicines, and livelihoods.

As forests disappear and habitats change, many species are finding it difficult to survive. Protecting biodiversity is therefore not just about saving animals—it is about protecting our own future.

In this chapter, you will become a **Green Biodiversity Explorer**, learning to observe, record, and protect the living world around you.

Story Corner



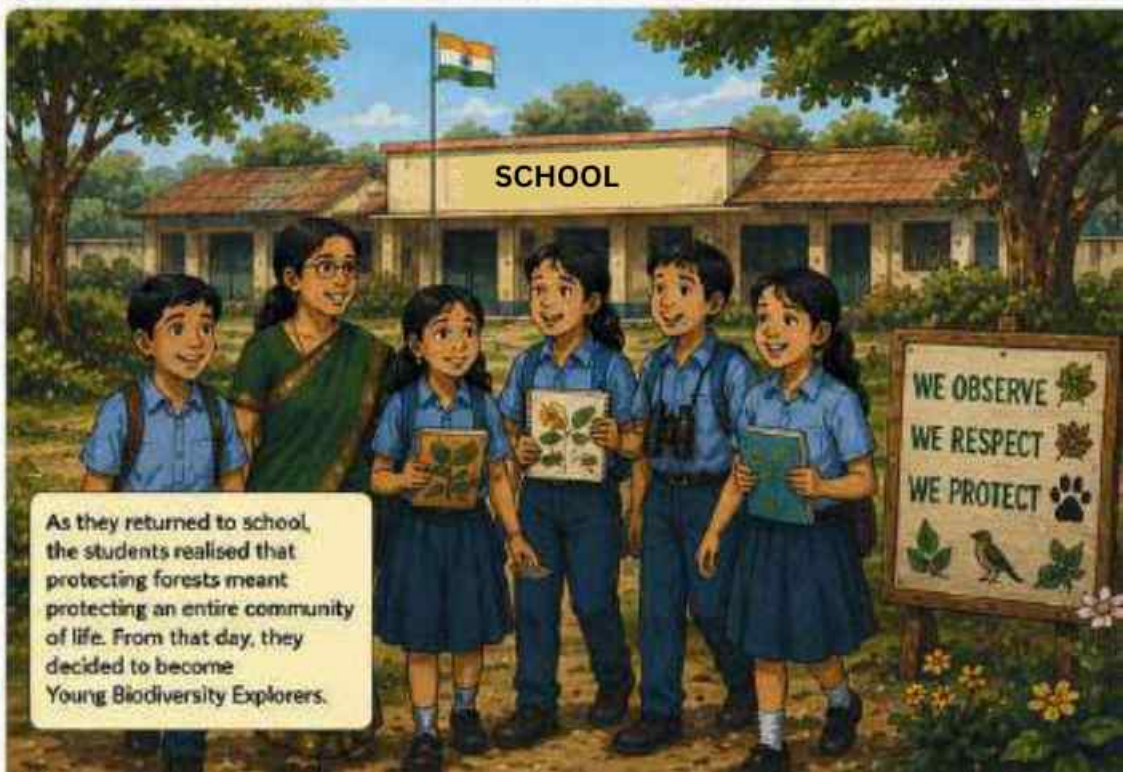
One Saturday morning, Class VII students from a government school in Latehar visited a forest with their science teacher. As they entered the forest, they heard the cheerful songs of birds, the buzzing of bees, and the rustling of leaves. "Listen carefully," said the teacher. "Every sound tells us that the forest is healthy." The students watched butterflies dancing among flowers, squirrels jumping between branches, and ants carrying tiny pieces of food.



After walking deeper into the forest, they reached an area that had been damaged by fire a few months earlier. The children stopped. The forest was strangely quiet. Very few birds could be heard. There were no butterflies around the flowers. The ground was covered with ash, and many young plants had dried up.



The teacher replied, "When forests lose their plants, animals lose their homes. When insects disappear, birds lose their food. Every living thing is connected. When one part of nature is damaged, many others are affected too."



As they returned to school, the students realised that protecting forests meant protecting an entire community of life. From that day, they decided to become Young Biodiversity Explorers.

What Is Biodiversity?

Biodiversity means the variety of all living things found on Earth.

It includes:

- 🌳 Trees
- 🌿 Shrubs
- 🌾 Grasses
- 🌸 Flowers
- 🍄 Fungi
- 🐘 Mammals
- 🦠 Tiny microorganisms
- 🐦 Birds
- 🐍 Reptiles
- 🐸 Amphibians
- 🦋 Insects
- 🐝 Pollinators

Healthy biodiversity keeps ecosystems balanced and resilient.

The Web of Life

Every organism depends on another for survival.

For example:

Sun → Grass → Grasshopper → Frog → Snake → Eagle

This is called a food chain. Many food chains are connected together to form a food web. If one species disappears, many others are affected.

Forests: More Than Just Trees

Forests perform many important jobs.

They:

- 🌧️ Help bring rainfall.
- 🌍 Store carbon and reduce global warming.
- 🌱 Protect fertile soil.
- 💧 Recharge groundwater.
- 🐝 Provide habitat for pollinators.
- 🐦 Support thousands of species.
- 🍄 Produce food and medicines.
- 🌬️ Improve air quality.



Nature's Helpers

Not every important animal is large. Small creatures also play vital roles.

- 🐝 Bees pollinate flowers.
- 🦋 Butterflies help plants reproduce.
- 🪱 Earthworms improve soil.
- 🍄 Fungi recycle dead plants.
- 🐜 Ants disperse seeds.

Without these tiny helpers, forests would struggle to survive.

Common Birds

- 🦚 Indian Peafowl
- 🐦 Asian Koel
- 🦜 Rose-ringed Parakeet
- 🦉 Spotted Owlet
- 🐦 Black Drongo

Meet the Wildlife of Jharkhand

Animal	Interesting Fact
Asian Elephant	Travels long distances searching for food and water.
Sloth Bear	Loves termites, fruits and honey.
Leopard	Mostly active during dawn and dusk.
Indian Giant Squirrel	Lives high in tree canopies.
Indian Pangolin	Covered with protective scales and feeds mainly on ants and termites.
Spotted Deer	Grazes in forests and grasslands.



Threats to Biodiversity

Many living organisms are under pressure because of:

- Forest fires
- 🪓 Habitat destruction
- 🚯 Plastic pollution
- 🚜 Unsustainable land use
- 🐾 Illegal hunting
- 🌡️ Climate change
- 🌿 Invasive plant species

Each threat weakens the balance of nature.

Conservation Begins with Us

Every student can help protect biodiversity.



Simple actions include:

✔️ Never disturb bird nests.

✔️ Avoid picking wild flowers unnecessarily.

✔️ Never trap or harm wild animals.

✔️ Plant native trees.

✔️ Keep forests and ponds free from plastic.

✔️ Report forest fires immediately.

✔️ Respect wildlife during forest visits.

Activity 1: My Village Biodiversity Register (One-Month Project)

Become a **Green Biodiversity Explorer**. During one month, observe your surroundings. Record every new species you find.

Date	Local Name	Plant/Animal/Bird/Insect	Where Found	Draw or Photograph

Aim to record at least:

- 15 plants
- 10 birds
- 5 mammals
- 5 medicinal plants
- 8 insects

Activity 2: Leaf Detective

Collect fallen leaves (do not pluck fresh ones).

Observe:

- Shape
- Size
- Colour
- Smell
- Texture

Paste them in your Nature Journal and identify the tree.

Activity 3: Morning Bird Count



Visit an open area between 6:00–8:00 a.m.

Observe for 20 minutes.

Bird	Number Seen	Behaviour

Did they fly, feed, sing, or build nests?

Activity 4: Pollinator Watch

Sit quietly near flowering plants.
For 15 minutes record:

- 🐝 Bees
- 🦋 Butterflies
- 🐞 Beetles
- 🐜 Ants

Discuss:
Why are these visitors important?

Activity 5: Build a Food Web

Using picture cards of local plants and animals, create a food web on chart paper.
Connect organisms with arrows showing who depends on whom.

Game Time: Who Am I?

One student receives a card with the name of an animal or plant.
The class asks only Yes/No questions
Example:
"Do you have feathers?"
"Do you live in water?"
"Do you eat insects?"
Guess the species..



Activity 6: Biodiversity Bingo

Your teacher will read clues.
Tick when you observe:

☐ A flowering tree	☐ A medicinal plant	☐ A butterfly
☐ A bird collecting food	☐ A spider web	☐ A frog
☐ An earthworm	☐ A mushroom	

The first student to complete a row shouts: **"Biodiversity!"**

Activity 7: Forest Scavenger Hunt

Without harming nature, find:

🌱 A seed	A unique rock	🍂 A dry leaf
🪶 A fallen feather	🍄 A fungus	🐜 An insect trail

Record where you found each item.

Activity 8: Interview a Forest Friend

Speak with:

- Forest Guard
- Village Elder
- Farmer
- Traditional Healer

Ask:

- Which animals were more common earlier?
- Which trees have become fewer?
- Which medicinal plants are disappearing?
- How can forests be protected?



Fun Corner: Match the Animal to Its Home

Animal	Habitat
Elephant	Flower Garden
Frog	Tree Hollow
Fish	Forest
Owl	River
Butterfly	Pond

Puzzle: Who Depends on Whom?



Match the organisms.

A

Bee

Earthworm

Tree

bird

Mushroom

B


Decomposition


Seed Dispersal


Oxygen


Healthy Soil


Pollination

Adopt One Tree

Choose one tree near your home or school.

For four weeks observe:



✓ New leaves
✓ Flowers
✓ Fruits
✓ Birds visiting
✓ Insects visiting

Draw your observations every week.

Give your tree a name.

Reflection



Complete these sentences.

The most interesting living organism I discovered was

_____.

I was surprised to learn that

_____.

One action I will take to protect biodiversity is

_____.

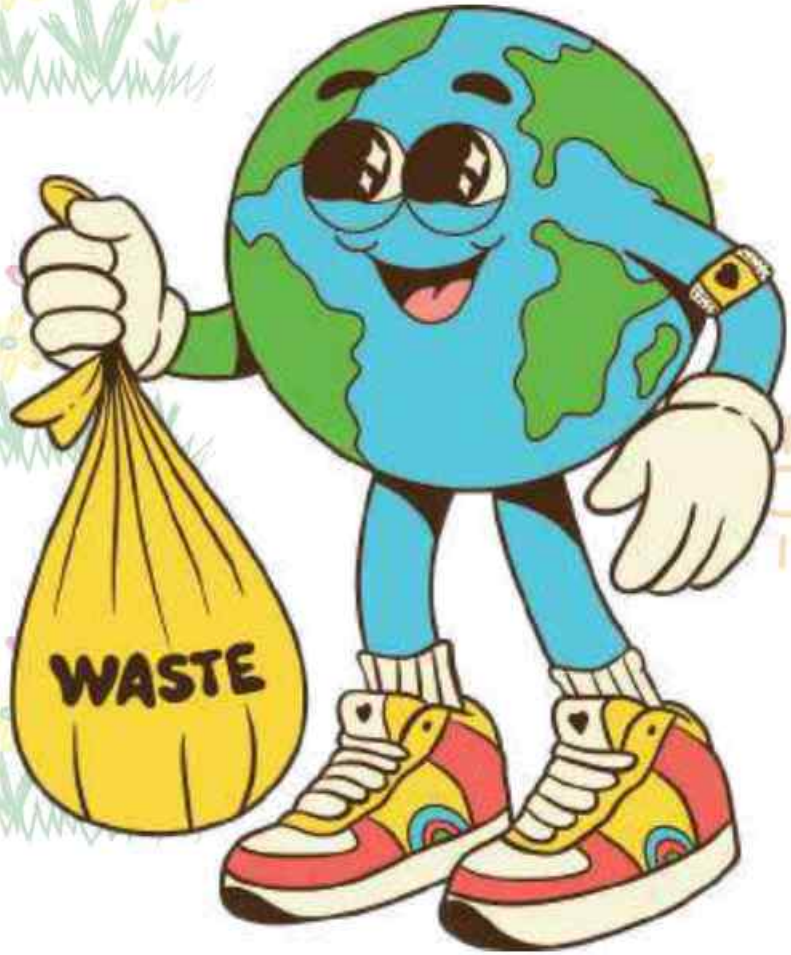


Green Biodiversity Explorer

"I will respect every form of life, protect forests and wildlife, observe nature with care, and encourage others to conserve the rich biodiversity of Jharkhand."

Chapter 8: Waste, Plastic Pollution and Clean Villages





Chapter Overview

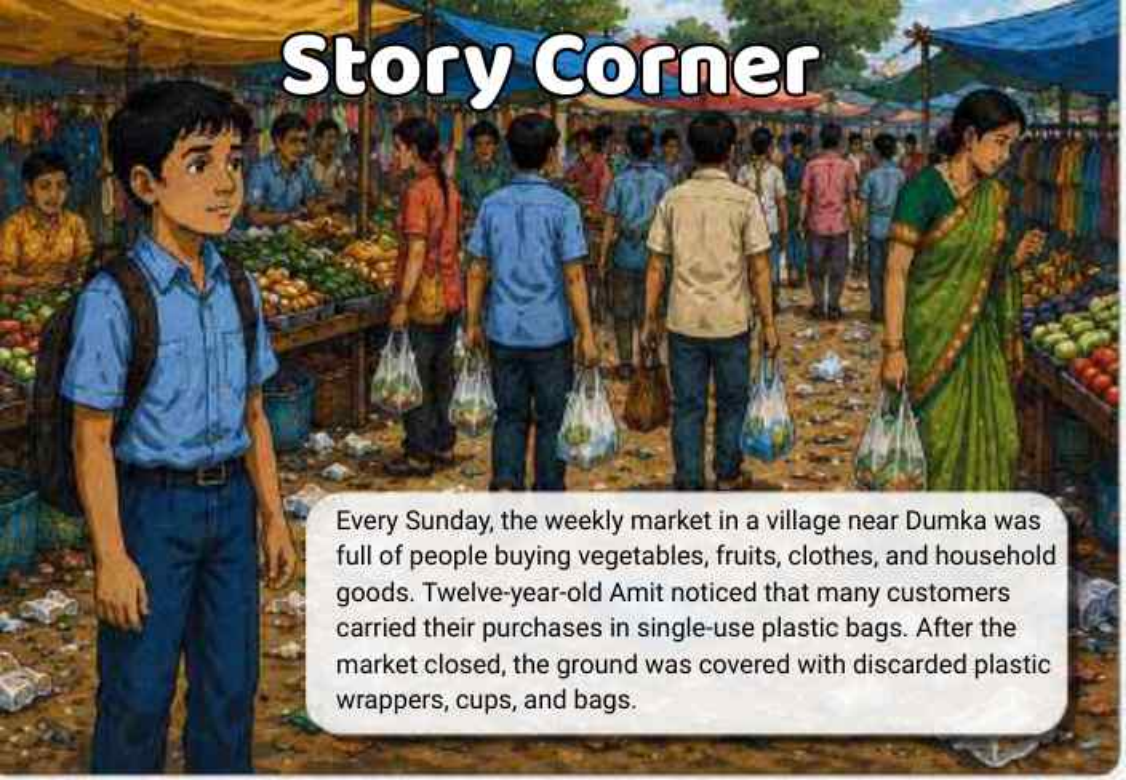
Every day, we use many things—food wrappers, plastic bottles, paper, old clothes, vegetable peels, notebooks, and broken household items. After using them, we throw them away. But have you ever wondered where this **waste** goes?

If waste is not managed properly, it does not simply disappear. It may remain in our surroundings, pollute rivers and ponds, block drains, harm animals, contaminate soil, and even affect our health. **Plastic waste** is especially harmful because it takes hundreds of years to break down.

Keeping our villages clean is not only about appearance. A clean environment reduces disease, protects water sources, keeps animals safe, and helps nature remain healthy.

In this chapter, you will become a **Green Clean Champion**, learning how to reduce waste, separate different types of waste, recycle useful materials, and encourage your family and community to adopt cleaner habits.

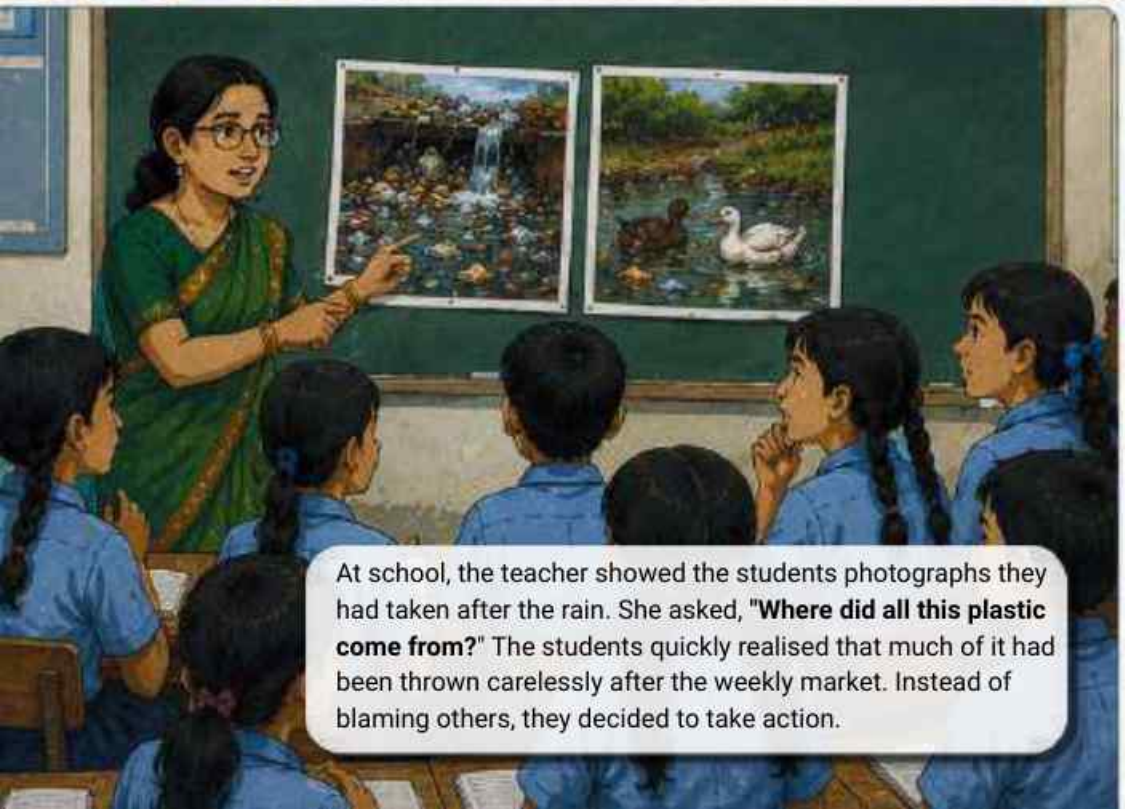
Story Corner



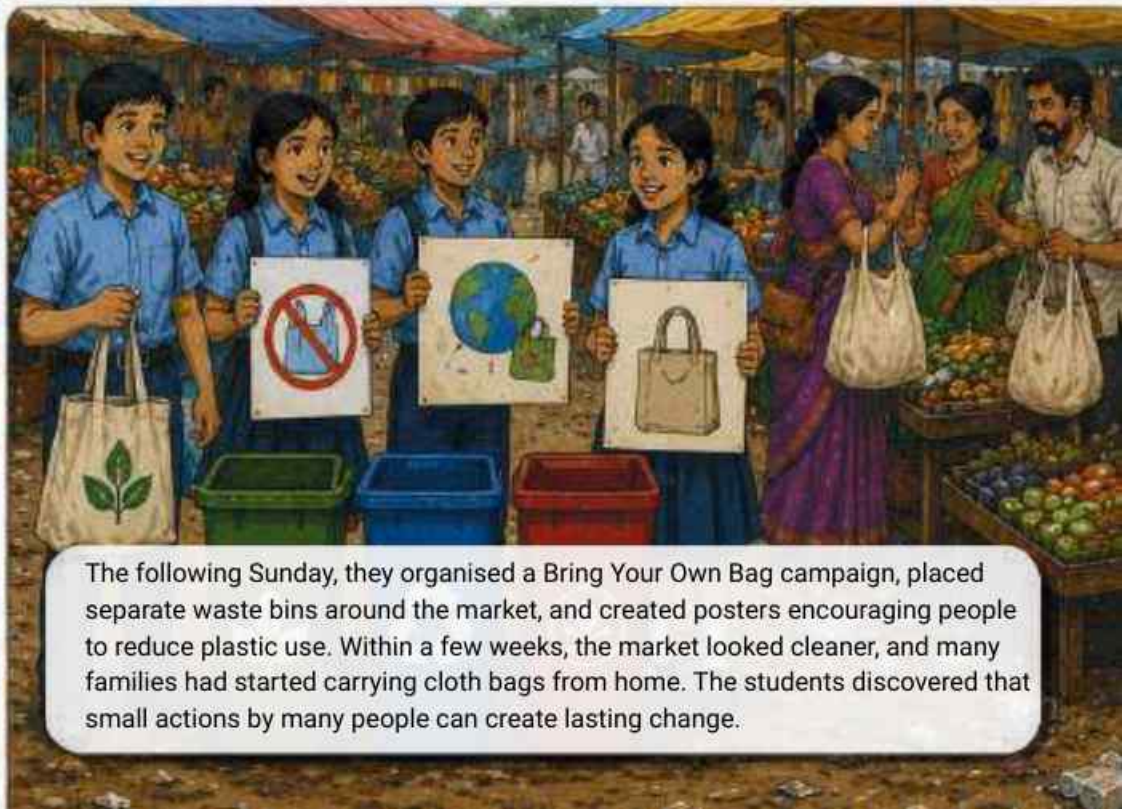
Every Sunday, the weekly market in a village near Dumka was full of people buying vegetables, fruits, clothes, and household goods. Twelve-year-old Amit noticed that many customers carried their purchases in single-use plastic bags. After the market closed, the ground was covered with discarded plastic wrappers, cups, and bags.



A few days later, heavy rain fell. The plastic waste blocked the village drain, causing water to overflow onto the road. Some of the waste was washed into the nearby pond where ducks searched for food among floating plastic.



At school, the teacher showed the students photographs they had taken after the rain. She asked, "**Where did all this plastic come from?**" The students quickly realised that much of it had been thrown carelessly after the weekly market. Instead of blaming others, they decided to take action.



The following Sunday, they organised a Bring Your Own Bag campaign, placed separate waste bins around the market, and created posters encouraging people to reduce plastic use. Within a few weeks, the market looked cleaner, and many families had started carrying cloth bags from home. The students discovered that small actions by many people can create lasting change.

What Is Waste?

Waste is any material that is no longer needed after use. Not all waste is the same. Some waste decomposes naturally, while some remains in the environment for many years. Understanding the different types of waste helps us manage them responsibly.



Types of Waste

Biodegradable Waste

This waste does not break down easily and may remain in the environment for many years.

Examples:

- 🥤 Plastic bottles
- 🧴 Shampoo bottles
- 🛍️ Plastic bags
- 🥛 Plastic containers
- 🥫 Metal cans

Proper recycling and responsible disposal are essential.

Non-Biodegradable Waste

Some waste contains harmful substances.

Examples:

- 🔋 Batteries
- 💡 Broken CFL bulbs
- 💊 Expired medicines
- 🧪 Chemical containers

These should never be thrown into ordinary waste bins.

Why Is Plastic Pollution Dangerous?

Plastic is useful, but excessive use creates serious environmental problems. Plastic waste can:

- 🐄 Be eaten by cattle and other animals.
- 🐟 Enter rivers and ponds.
- 🌱 Reduce soil quality.



- 🚫 Block drains and cause waterlogging.
  Release harmful gases when burned.
- 🦅 Harm birds and wildlife.

Using less plastic is one of the easiest ways to protect the environment.

The 5Rs of Waste Management

Good waste management begins before waste is created.

Refuse: Say "No" to unnecessary single-use plastic items.

Reduce: Buy only what you need.

Reuse: Use items again instead of throwing them away.

Repair: Fix damaged items whenever possible.

Recycle: Send recyclable materials for processing into new products.

Remember: The best waste is the waste that is never created.

Waste Segregation

Separating waste at the source makes recycling easier.

Use three separate bins:

- 🟢 **Green Bin** – Wet waste (food scraps, vegetable peels, leaves)
- 🔵 **Blue Bin** – Dry recyclable waste (paper, plastic, metal, glass)
- 🔴 **Red Bin** – Hazardous waste (batteries, medicines, bulbs)

Segregation should happen at home, in school, and during community events.



Compost: Turning Waste into Wealth

Kitchen waste and dry leaves can be converted into compost.



Compost:

🌱 Enriches soil.

🌾 Helps plants grow.

💧 Improves water retention.

♻️ Reduces the amount of waste sent to dumping sites.

Nature recycles everything—and we can learn from nature.

Activity 1: Household Waste Audit (One-Month Project)

Observe your household for seven days. Record the waste generated each day.

Type of Waste	Quantity	Can It Be Reused?	Can It Be Recycled?
Food Waste			
Plastic			
Paper			
Glass			
Metal			

At the end of the week:

- Which type of waste was most common?
- Which items could have been avoided?

Activity 2: School Waste Audit

Work in groups.

Observe waste generated in:

✓ Classrooms

✓ Playground

✓ Mid-day meal area

✓ School garden



Prepare a report suggesting ways to reduce waste.

Activity 3: Design Your Own Dustbin

Using old paint buckets, cardboard boxes or metal containers, create colourful waste bins for your classroom.

Label them:

🟢 Wet Waste 🔵 Dry Waste 🔴 Hazardous Waste

Decorate them with environmental messages.

Activity 4: Plastic-Free Lunch Week

For one week, avoid bringing food wrapped in single-use plastic.



Instead, use:

🥣 Steel lunch boxes

🍶 Reusable water bottles

🍌 Banana leaves or reusable cloth wraps (where culturally appropriate)

At the end of the week, calculate how much plastic the class avoided.

Activity 5: Best Out of Waste Challenge

Create useful objects from discarded materials.

Examples:

🎨 Pen holder

🌱 Plant pot

📒 Notebook cover

👜 Cloth shopping bag

🕊️ Bird feeder

Organise a classroom exhibition.



Activity 6: Waste Detectives



Walk around your school or village.
Tick what you observe.

- ☐ Plastic bags
- ☐ Burning waste
- ☐ Food waste
- ☐ Overflowing dustbins
- ☐ Glass bottles
- ☐ Waste near water bodies

Discuss possible solutions with your classmates.

Activity 7: Clean Village Campaign

Plan a one-day cleanliness drive.
Include:

- Cleaning public spaces
- Waste segregation
- Awareness posters
- Door-to-door messages
- Tree guards using recycled materials

Invite parents and community members to participate.

Game Time: Waste Sorting Relay

Materials: Picture cards showing different waste items.
Three labelled baskets:
🟢 Wet Waste 🔵 Dry Waste 🔴 Hazardous Waste
Each team races to place the cards in the correct basket. The team with the most correct answers wins.

Fun Corner: Waste Treasure Hunt



Can you find these around your home or school?

- ☐ A reusable cloth bag
- ☐ A steel water bottle
- ☐ A compost pit
- ☐ A paper bag
- ☐ A recycled object
- ☐ A repaired item

Tick each one you find.



Puzzle: Match the Waste



Waste Item	Correct Bin
Banana Peel	Red
Plastic Bottle	Green
Newspaper	Red
Battery	Green
Vegetable Peels	Blue
Broken CFL Bulb	Blue

My Family's Zero Waste Challenge

For four weeks, record your progress.

Action	Week 1	Week 2	Week 3	Week 4
Carried a cloth bag				
Segregated waste				
Avoided single-use plastic				
Reused old materials				
Made compost				

Ask a family member to sign your chart each week.

Reflection



Complete these sentences.

The most common waste in my home is

_____.

One plastic item my family can stop using is

_____.

One way I can keep my village clean is

_____.

Answers: Banana Peel-Green, Plastic Bottle- Blue, Newspaper- Blue, Battery- Red, Vegetable Peels-Green, Broken CFL Bulb- Red.

Chapter 9: Sustainable Lifestyles and Climate Solutions



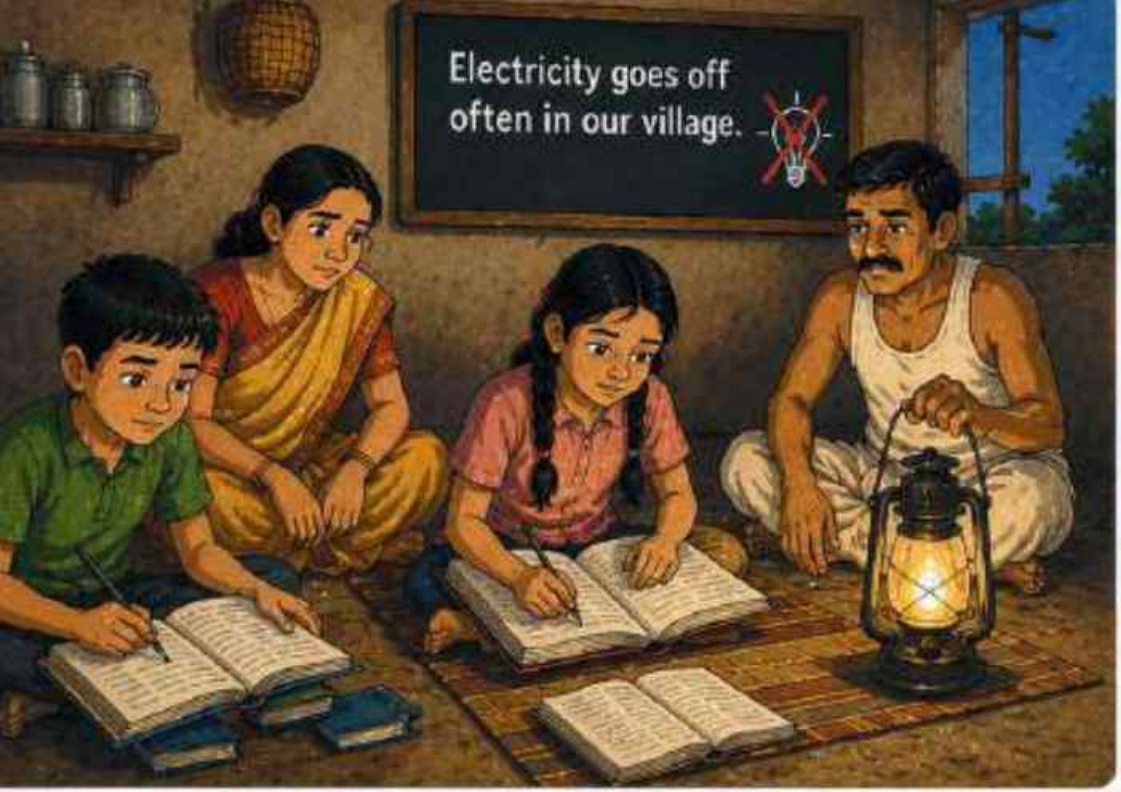
Chapter Overview

Every day, we make choices that **affect the environment**. The food we eat, the way we travel, how we use electricity, the amount of water we consume, and even what we buy all leave an impact on our planet.

A sustainable lifestyle means using natural resources carefully so that today's needs are met without reducing the opportunities of future generations. It is not about living with less—it is about living wisely.

Many traditional practices followed in rural Jharkhand already reflect sustainable living. Families often repair tools instead of throwing them away, save seeds for the next season, grow vegetables near their homes, walk or cycle short distances, and share resources within the community. These simple habits help **conserve energy, reduce waste, and protect nature.**

In this chapter, you will become a **Green Climate Action Champion**, discovering how everyday actions can reduce pollution, save energy, support biodiversity, and build stronger, climate-resilient communities.


Electricity goes off
often in our village.


GOVERNMENT PRIMARY SCHOOL
Solar Energy
for a Bright
Tomorrow


Solar lights
near the
hand pump
Solar streetlights
near school and
village paths
Solar-powered
irrigation pumps
for our farms


VILLAGE PANCHAYAT MEETING
Clean Energy, Better Future
Renewable Energy
Reduces Pollution
Solar Energy
Saves Money
Clean Energy
Healthy Life
Story Corner

What Is a Sustainable Lifestyle?

A sustainable lifestyle means making choices that:

🌳 Protect natural resources
💧 Save water ♻️ Minimise waste
⚡ Use energy wisely 🌳 Protect forests and wildlife
🌱 Reduce pollution 👨‍👩‍👧 Benefit both people and nature

Every positive action, however small, contributes to a healthier planet.



Energy Around Us

Energy helps us cook food, light our homes, irrigate fields, operate machines, and travel.

Non-Renewable Energy

These energy sources take millions of years to form and cannot be replaced quickly.

Examples:

🛢️ Coal ⛽ Petrol 🛢️ Diesel LPG



Using these fuels releases greenhouse gases.

Renewable Energy

Renewable energy comes from natural sources that are continuously replenished.

Examples:

☀️ Solar Energy 💨 Wind Energy 💧 Hydropower
🌾 Biogas

Using renewable energy helps reduce air pollution and climate change.



Saving Energy Every Day

Saving energy is one of the easiest climate solutions.

Simple habits include:

💡 Switch off lights and fans when leaving a room.
📺 Turn off televisions and chargers when not in use.
☀️ Study near windows during daylight.
🚶 Walk or cycle for short distances.
🛠️ Repair electrical appliances instead of replacing them unnecessarily.

Small actions, repeated every day, save both energy and money.

Sustainable Agriculture

Farmers play an important role in protecting the environment.

Climate-friendly farming practices include:



🌾 Crop rotation
🌱 Mixed cropping
🌿 Organic manure
🐄 Compost and vermicompost
🌳 Agroforestry
💧 Efficient irrigation
🌼 Planting flowering plants to attract pollinators

Healthy soil produces healthy crops and supports biodiversity.

Climate-Friendly Transport

Vehicles using petrol and diesel release greenhouse gases.

Whenever possible:



🚶 Walk
🚲 Ride a bicycle
🚌 Use public transport
🚗 Share vehicles with others

These choices reduce pollution and improve health.

Sustainable Homes

Families can reduce their environmental impact by:

- 🌧️ Collecting rainwater
- ♻️ Segregating household waste
- 🥕 Growing vegetables in kitchen gardens
- 🛍️ Carrying reusable cloth bags
- 🥤 Using refillable water bottles
- 🍃 Planting native trees

Every home can become a model of sustainability.

What Is a Carbon Footprint?

A carbon footprint is the amount of greenhouse gases produced by our daily activities.

Examples include:

- 🚗 Travelling by petrol vehicles
- Burning waste
- ⚡ Wasting electricity
- 🛍️ Buying unnecessary items

We can reduce our carbon footprint by making climate-friendly choices.

Activity 1: My Household Climate Action Plan (One-Month Project)

Observe your family's daily habits.
Tick the actions already followed.

Climate-Friendly Action	Week 1	Week 2	Week 3	Week 4
Switched off unused lights				
Used cloth bags				
Saved water				
Segregated waste				
Walked or cycled short distances				
Used compost				
Planted or cared for a tree				

Discuss your progress with your family every weekend.

Activity 2: Energy Detective

Visit your home and school.
Look for places where energy is being wasted.
Examples:

- □ Lights left on
- □ Fans running in empty rooms
- □ Chargers plugged in unnecessarily
- □ Water pumps left running

Suggest one improvement for each observation.

Activity 3: Sustainable Lifestyle Scorecard

Answer "Yes" or "No."



- I carry a reusable water bottle.
- I switch off lights after use.
- I avoid wasting food.
- I use both sides of paper.
- I walk or cycle when possible.
- I encourage my family to save water.
- I help segregate waste.



Count your "Yes" answers.

6–7 = Climate Champion 🌍
4–5 = Green Guardian 🌱
2–3 = Eco Learner 🌿
0–1 = Time to Start! 🌞

Activity 4: Kitchen Garden Planner

Design a small kitchen garden for your home or school.

Include:

🥬 Leafy vegetables
🍅 Seasonal vegetables
🌶️ Spices
🌼 Flowering plants for pollinators

Draw your layout and explain why you chose each plant

Activity 5: Climate Solutions Around My Village

Walk around your village and identify positive environmental practices.

Examples:

☐ Kitchen gardens ☐ Tree plantations
☐ Compost pits ☐ Community ponds
☐ Solar lights ☐ Shared transport
☐ Rainwater harvesting

Discuss how these practices help the environment.

Activity 6: Design a Climate-Friendly Home

Draw a house that includes:

☀️ Solar panels ♻️ Waste segregation bins
🌧️ Rainwater harvesting 🥕 Kitchen garden
🌳 Shade trees 💧 Water-saving features

Present your design to the class.

Activity 7: Renewable Energy Model

Working in groups, prepare a simple model of one renewable energy system using recycled materials.

Ideas:

☀️ Solar cooker 💧 Water wheel
💨 Windmill 🌾 Biogas plant

Explain how it helps reduce pollution.

Climate Action Relay

Divide the class into teams.

Prepare action cards such as:

- Switch off the light.
- Plant a tree.
- Walk to school.
- Burn plastic.
- Waste food.
- Repair a leaking tap.
- Ride a bicycle.
- Throw rubbish into a river.

Students must run, pick a card, and place it under:

🌱 Climate-Friendly ❌ Climate-Harmful

After the relay, discuss each choice.

Fun Corner: Climate Action Bingo

Find someone who:

☐ Uses a bicycle regularly
☐ Has planted a tree
☐ Carries a cloth bag
☐ Helps water plants
☐ Uses compost
☐ Switches off unnecessary lights
☐ Brings a reusable bottle
☐ Has a kitchen garden



The first student to complete four boxes in a row calls out:

"Green Climate Action Champion".

Puzzle: Match the Climate Solution

Action	Benefit
Solar Energy	Absorbs carbon dioxide
Composting	Stores water
Tree Plantation	Improves soil
Rainwater Harvesting	Reduces fossil fuel use
Cycling	Provides fresh local food
Kitchen Garden	Reduces air pollution





Community Challenge: My Green Family Campaign

Choose five climate-friendly habits your family will practise for one month.

Examples:

- ✓ **Carry cloth bags**
- ✓ **Save water**
- ✓ **Grow vegetables**
- ✓ **Switch off unused appliances**
- ✓ **Avoid burning waste**
- ✓ **Repair instead of replacing**
- ✓ **Reduce food waste**

At the end of the month, discuss:

- **Which habit was easiest?**
- **Which was most difficult?**
- **Which saved the most money or resources?**

Reflection

Complete these sentences.

One sustainable habit I already practise is

_____.

One new habit I will start this month is

_____.

The climate solution that inspired me most is

_____.

I will encourage my family to

_____.

Chapter 10: Green Champions and Community Action



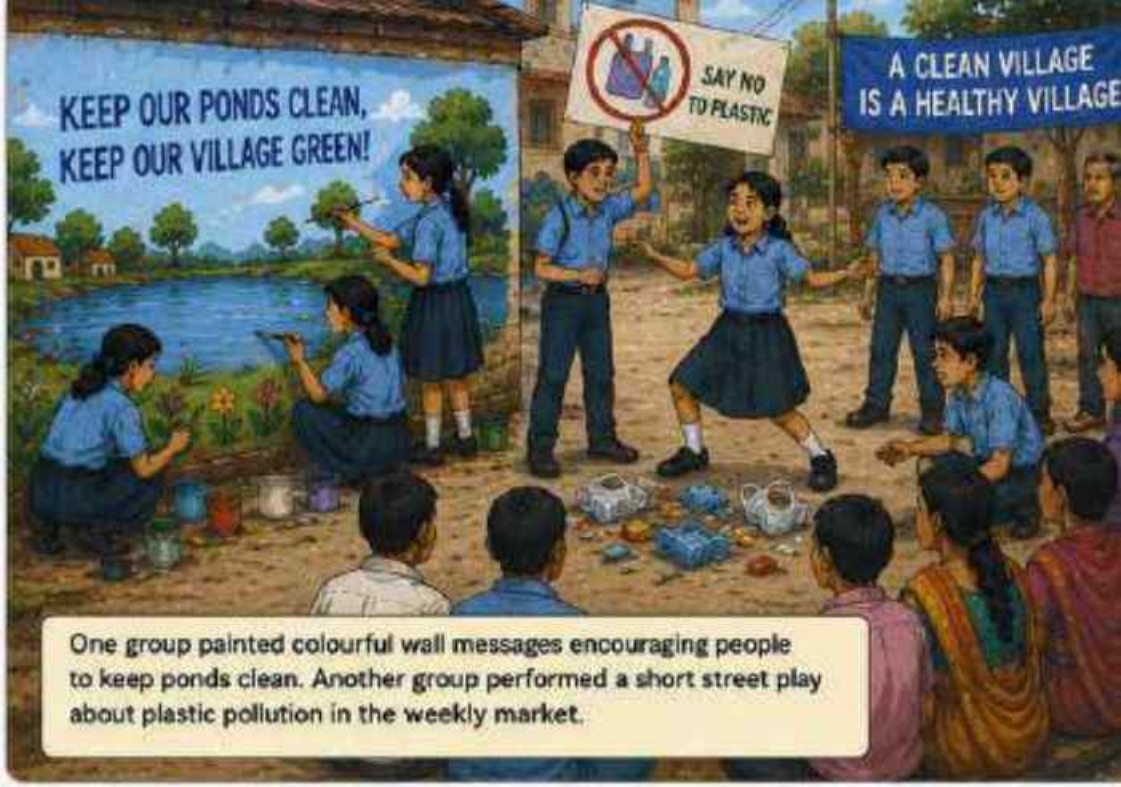
Chapter Overview

One child switching off a light saves a little electricity.
One family planting a tree improves one corner of a village.
One classroom separating waste keeps a school cleaner.
But imagine if every child, every family, and every village worked together.
Small individual actions become powerful when people cooperate.
Many environmental problems cannot be solved by one person alone. Protecting forests, conserving water, reducing waste, planting trees, and keeping villages clean require teamwork, leadership, and community participation.
Children are often the strongest messengers of change. They share ideas with their families, inspire neighbours, organise campaigns, and encourage others to protect the environment.
In this chapter, you will become a **Green Champion,** learning how to communicate environmental messages, organise activities, and lead your community towards a cleaner, healthier, and more sustainable future.

Story Corner



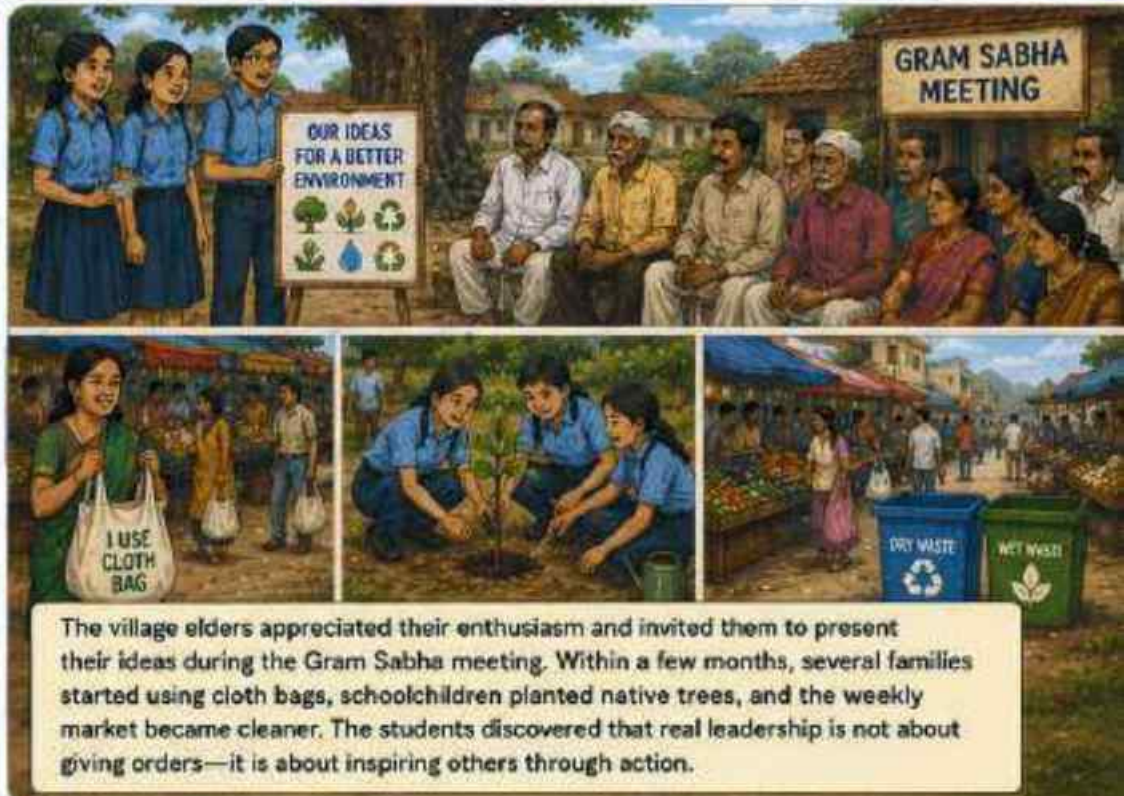
A government middle school in West Singhbhum organised an Environment Week. The students noticed that although they had learned many ways to protect nature, very few people in their village knew about them. Their teacher asked, "If you already know the solutions, how can you help others learn?" The class decided to act.



One group painted colourful wall messages encouraging people to keep ponds clean. Another group performed a short street play about plastic pollution in the weekly market.



Some students organised a bicycle rally carrying handmade banners with environmental slogans. Others visited nearby houses, explaining how waste segregation and composting could reduce pollution.



The village elders appreciated their enthusiasm and invited them to present their ideas during the Gram Sabha meeting. Within a few months, several families started using cloth bags, schoolchildren planted native trees, and the weekly market became cleaner. The students discovered that real leadership is not about giving orders—it is about inspiring others through action.

What Is Environmental Leadership?

A leader is someone who encourages others to work towards a common goal.



An environmental leader:

🌱 Leads by example.
🤝 Works with others.
🗣️ Shares useful information.
🎯 Solves problems peacefully.
🌍 Cares for people and nature.

Age does not determine leadership—your actions do.

Why Does Community Action Matter?

Environmental problems affect everyone.
Working together helps communities:

💧 Protect water sources.
🌳 Increase tree cover.
🌾 Improve farming practices.
🧹 Keep villages clean.
🌍 Prepare for climate-related challenges.
♻️ Reduce waste.

When everyone contributes, even small efforts create lasting change.

How Can Students Become Green Champions?

You can:

📢 Speak about environmental issues during school assembly.
🌿 Organise tree planting events.
🎭 Perform educational street plays.
🎨 Paint awareness murals.
📚 Create environmental clubs.
📝 Prepare information leaflets.
📱 Share positive environmental messages through community WhatsApp groups (where appropriate).
🚶 Conduct awareness rallies.
🎤 Interview local leaders and environmental workers.

Good Communication Skills

A Green Champion should communicate clearly and respectfully.
Remember to:

👂 Listen carefully.
🎨 Use pictures and demonstrations.
😊 Speak politely.
🤝 Respect different opinions.
📖 Use simple language.
📢 Encourage participation instead of blaming people.

Positive messages inspire lasting change.

Teamwork Makes Change Possible

Every successful campaign needs teamwork.
Different members can take different responsibilities.
Examples:



🎨 Poster Designers
🎭 Drama Team
📢 Announcement Team
📷 Documentation Team
🌳 Plantation Team
📊 Survey Team

Everyone has an important role.



Activity 1: One-Month Green Champion Campaign

Work in teams to design a community awareness campaign.

Choose one topic:

🌳 Tree Protection
💧 Water Conservation
♻️ Waste Segregation
🚯 Plastic-Free Village
🦋 Biodiversity Conservation
⚡ Energy Conservation

Plan:

- Objective
- Audience
- Activities
- Materials needed
- Expected outcomes

Present your campaign to the class before implementation.

Activity 2: Community Awareness Survey

Interview ten families.

Ask:

- What environmental problem worries you most?
- Do you segregate waste?
- Do you use cloth bags?
- Have you planted trees?
- What changes would you like to see?

Prepare a simple summary of the responses.

Activity 3: Create Environmental Slogans

Write short, catchy messages.

Examples:

- "Clean Village, Healthy Future."
- "Every Drop Matters."
- "Plant Today, Breathe Tomorrow."

Display the best slogans on school notice boards.

Activity 4: Wall Painting Design

Design a mural promoting one environmental message.

Include:

🌳 Trees 🌞 Sun 💧 Water ♻️ Recycling 🐦 Wildlife

Use bright colours and simple messages that everyone can understand.

Activity 5: Street Theatre (Nukkad Natak)

Working in groups, prepare a 5–10 minute play on one topic:

- Plastic pollution
- Saving water
- Forest conservation
- Climate change
- Waste segregation

Perform it during:

- Village meetings
- School functions
- Weekly markets
- Community events

After the performance, ask the audience what actions they will take.

Activity 6: Organise a Green Rally

Prepare:

📢 Slogans
🎨 Placards
🎵 Songs
🚶 Rally route

Invite:

- Parents
- Panchayat members
- Village elders
- Self-help groups
- Farmers

Conclude the rally with a community pledge.

Activity 7: Environmental Exhibition

Create displays using charts, photographs, recycled models, and local examples.

Suggested themes:

- Climate Change
- Forests of Jharkhand
- Water Conservation
- Biodiversity
- Waste Management
- Renewable Energy

Invite neighbouring schools and community members.

Activity 8: Green Club

Form a school Green Club.

Elect:

🌿 President
📝 Secretary
🎨 Creative Coordinator
📊 Survey Coordinator
🌳 Plantation Leader

The club can meet once every month to plan and review environmental activities.

Game Time: Mission Green

Prepare challenge cards.

Examples:

- Convince a neighbour to use a cloth bag.
- Teach a younger child about composting.
- Plant a native tree.
- Conduct a five-minute awareness talk.
- Help clean a public place.

Students earn one point for every completed mission.

The student or team with the highest score becomes the Green Champion of the Month.

Activity 9: My Community Action Diary

	My Action	Who Participated?	Result
Week 1			
Week 2			
Week 3			
Week 4			

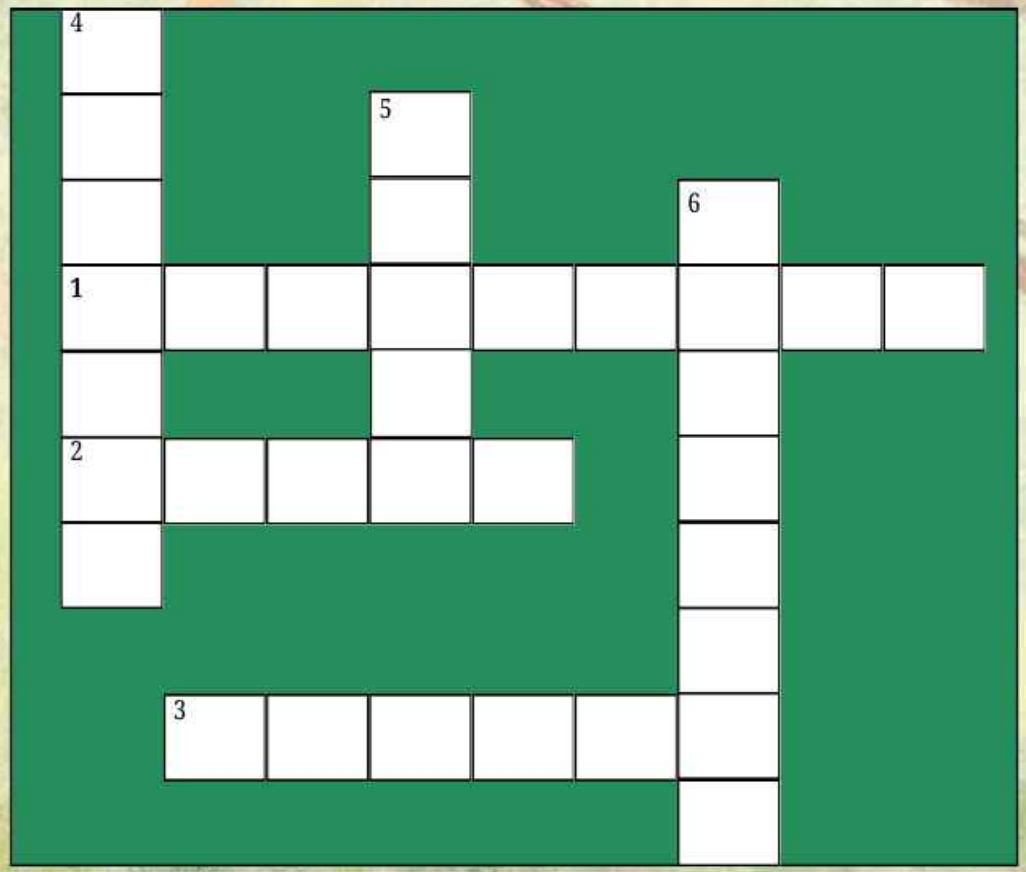
Fun Corner: Eco-Leadership Crossword

Across

1. Speaking to villagers about environmental protection.
2. A public event where people walk together to spread awareness.
3. A person who inspires others to protect the environment.

Down

5. A short performance to educate people in public places.
6. Colourful drawings on public walls carrying messages.
7. Working together towards a common goal.





Reflection

Complete these sentences.

The environmental issue I want to address most is

_____.

The leadership skill I improved is

_____.

The activity I enjoyed the most was

_____.

As a Green Champion, I will continue to

_____.

Answers: 1. Awareness 2. Rally 3. Leader 4. Theatre 5. Mural 6. Teamwork

JAGO FOUNDATION

A Safe Childhood For Every Child

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