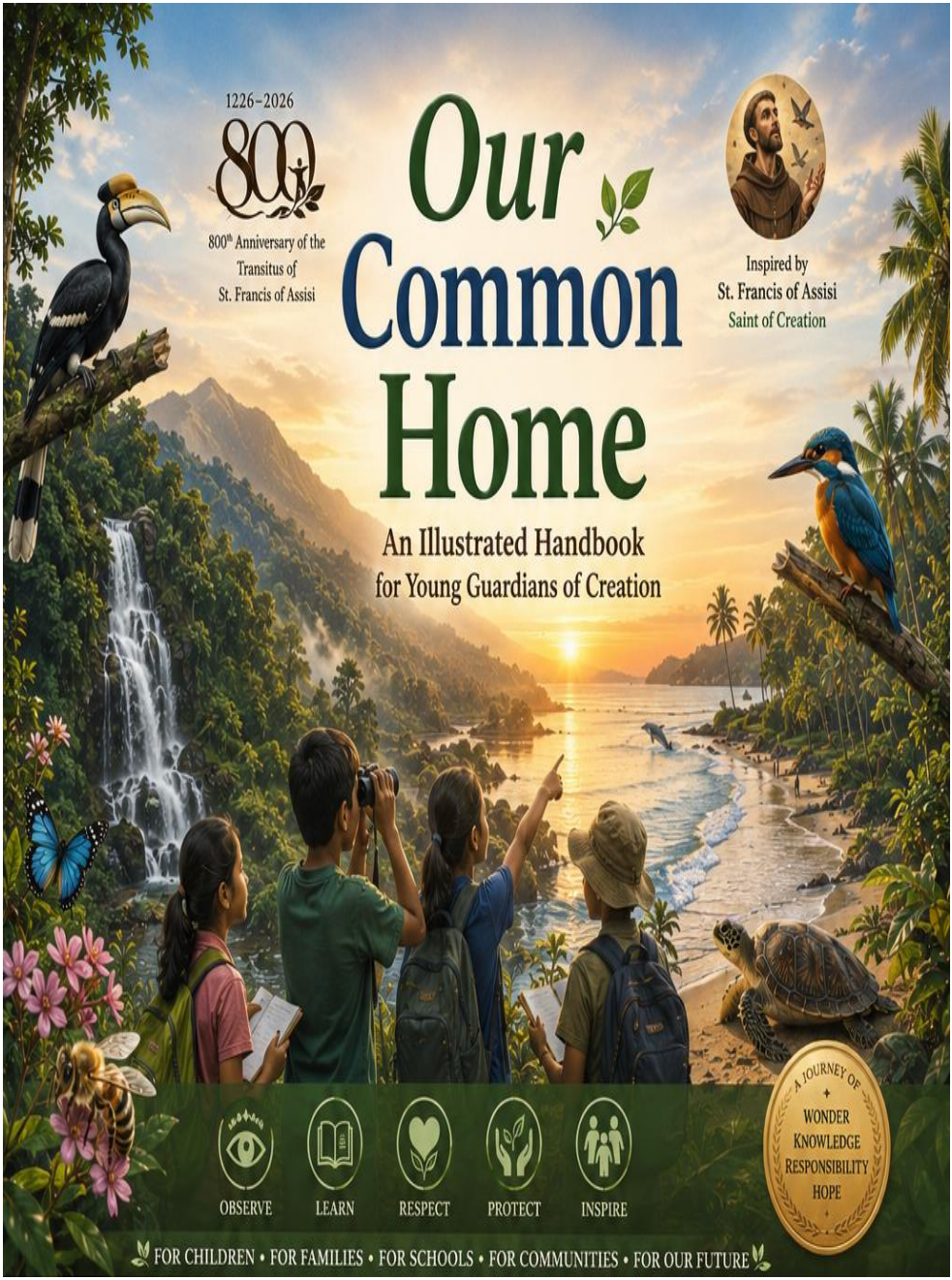
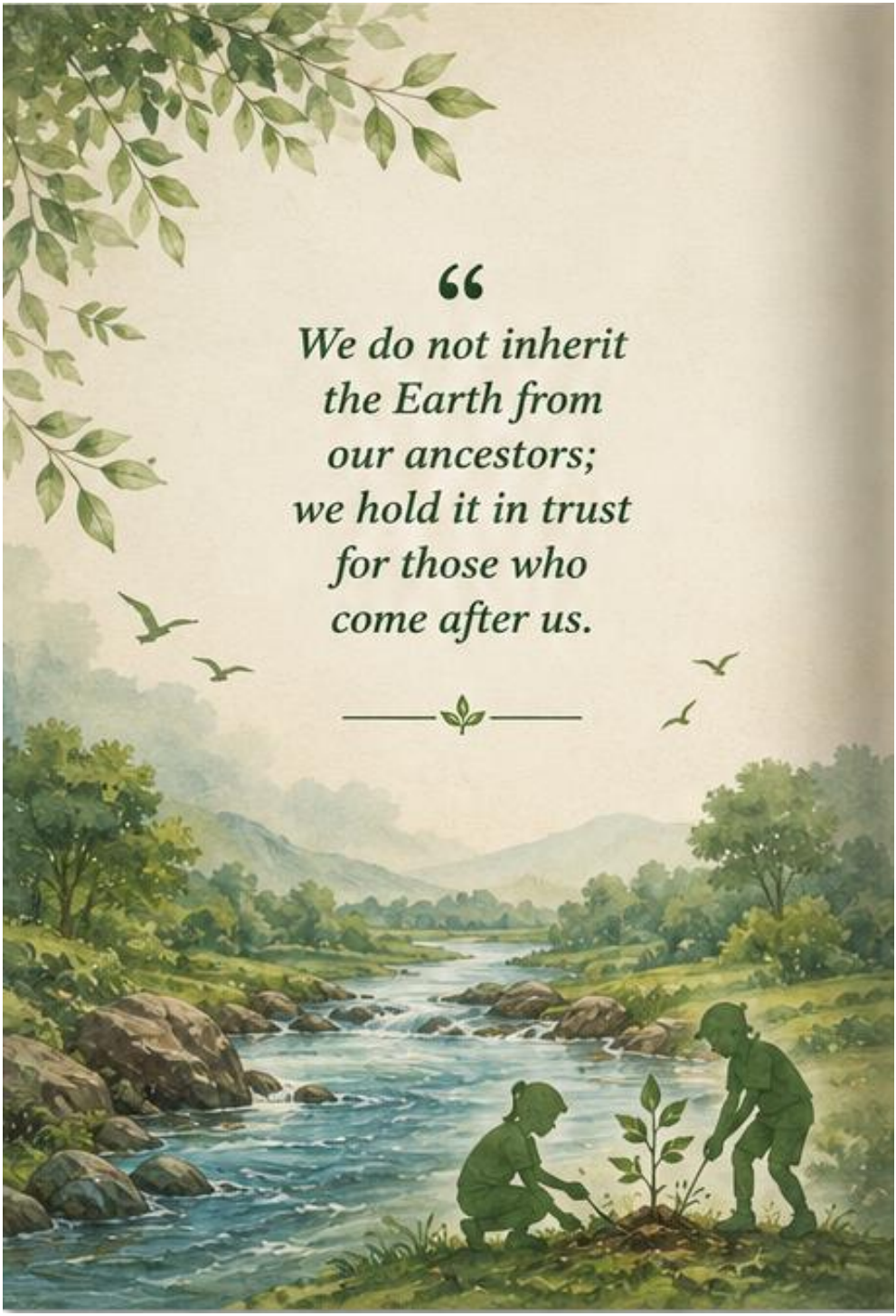

1226–2026
800
800th Anniversary of the Transitus of St. Francis of Assisi
Our Common Home
An Illustrated Handbook for Young Guardians of Creation
Inspired by St. Francis of Assisi
Saint of Creation
OBSERVE
LEARN
RESPECT
PROTECT
INSPIRE
A JOURNEY OF
WONDER
KNOWLEDGE
RESPONSIBILITY
HOPE
FOR CHILDREN • FOR FAMILIES • FOR SCHOOLS • FOR COMMUNITIES • FOR OUR FUTURE


“
We do not inherit
the Earth from
our ancestors;
we hold it in trust
for those who
come after us.

OUR COMMON HOME

An Illustrated Handbook for Young Guardians of Creation

A journey of wonder, understanding, care and action to inspire a greener, healthier and more sustainable world.

Prepared for the

Season of Creation 2026
800th Anniversary of the Transitus of St. Francis of Assisi (1226–2026)

Our Prayer Before Beginning the Handbook

Almighty God, our Creator and Lord, With humble hearts we place before You this work, ***Our Common Home – Ecology Student Handbook***.

You created the heavens and the earth, the mountains and rivers, the forests and oceans, every bird of the air, every creature of the land and sea, and You entrusted this beautiful world to our care. Grant us patience as we write, wisdom as we teach, creativity as we illustrate, and faithfulness as we present the truth. Help us to prepare every page with craftsmanship, integrity and hope, so that it may inspire young minds to love, understand and protect the wonderful gift of creation.

May this handbook become more than a book. May it become a seed planted in the hearts of children—a seed that grows into compassion, responsibility, scientific curiosity, respect for all life, and a lifelong commitment to care for our common home. Bless every student who will read these pages, every teacher who will use them, every parent who will encourage a child, every volunteer who will contribute, every artist who will illustrate, every scientist who will guide us, and every sponsor whose generosity will help make this vision a reality.

As we commemorate the **800th Centenary of the Franciscan Tradition of Caring for Creation (1226–2026)**, may this handbook become an enduring legacy—one that continues to educate, inspire and bear fruit long after we are gone. May future generations discover within these pages a deeper appreciation for the beauty of Your creation and a renewed commitment to protect it with love and responsibility.

May every tree planted, every river restored, every bird protected, every child inspired, and every act of kindness towards nature become a hymn of thanksgiving to You.

We dedicate this work entirely to Your glory and to the service of all people. We make this humble prayer through Jesus Christ our Lord. **Amen.**

Dedication

This handbook is lovingly dedicated to

St. Francis of Assisi (1181/1182–1226)

whose joyful love for all creation continues to inspire people across the world to live with simplicity, gratitude, peace and respect for our common home.

It is also dedicated with deep gratitude to the memory of

Rev. Fr. Dr. Bolmax Pereira

Priest, educator, environmental advocate and passionate guardian of Goa's natural heritage.

Through his vision, scholarship and tireless commitment to protecting creation, he inspired countless people to care for the forests, rivers, fields, coastlines and biodiversity of Goa.

May this handbook encourage every reader to cherish the Earth as our shared home and to become a faithful guardian of creation for generations to come.

Foreword

There are few classrooms more inspiring than the natural world itself.

Every sunrise, every flowing river, every towering tree, every bird in flight and every drop of rain reminds us that life on Earth exists through countless relationships. When we begin to understand these relationships, we also begin to understand our responsibility towards them.

Today, our planet faces unprecedented environmental challenges. Climate change, biodiversity loss, pollution and the unsustainable use of natural resources are affecting communities across the world. Yet, alongside these challenges lies an extraordinary opportunity—the opportunity to educate a generation that is informed, compassionate and prepared to become responsible stewards of our shared future.

Our Common Home is a timely and thoughtful contribution to that mission.

What makes this handbook unique is that it does not merely present scientific facts. It invites young readers to observe, question, explore and appreciate the remarkable world around them. By connecting ecology with everyday life, it encourages children to see themselves not as passive observers, but as active participants in protecting the environment.

The handbook takes readers on a beautiful journey—from understanding air, water, soil and forests to appreciating biodiversity, ecosystems, climate, sustainable living and renewable energy. Throughout its pages, science is presented with clarity, while values such as respect, gratitude, responsibility and hope gently inspire action. These are universal values that transcend cultures, faiths and communities and are essential for building a sustainable future.

I am particularly pleased that this publication has been prepared to commemorate the **800th Anniversary of the Transitus of St. Francis**

of Assisi. Although St. Francis lived eight centuries ago, his profound respect for nature and his vision of living in harmony with all creation continue to inspire people across the world. His example reminds us that caring for the Earth is not simply an environmental responsibility—it is an expression of our shared humanity.

This handbook also honours the memory of **Rev. Dr. Bolmax Pereira**, whose lifelong dedication to protecting Goa's rich natural heritage inspired countless individuals to become advocates for environmental conservation. His commitment to ecological awareness and sustainable development serves as an enduring example of how knowledge, courage and perseverance can bring about meaningful change.

I warmly congratulate the editorial team, educators, artists and all those whose dedication has brought this handbook to life. I hope it finds a place in every school, every library, every home and every community, encouraging children to become curious learners, thoughtful citizens and responsible guardians of our common home.

The future of our planet will not be shaped only by scientific discoveries or technological innovations. It will also be shaped by the choices made each day by informed and caring people. If this handbook helps even one child to look at a tree with greater appreciation, conserve a drop of water, protect a butterfly, plant a sapling or inspire others to care for nature, it will have fulfilled a noble purpose.

May *Our Common Home* awaken wonder, deepen understanding and inspire action for generations to come.

Dr. Roxy Mathew Koll
Climate Scientist
Indian Institute of Tropical Meteorology (IITM), Pune

Preface

Every child is born with a sense of wonder. The first drops of monsoon rain, the song of a bird at dawn, the shade of a great banyan tree, the fragrance of flowers, the rhythm of the waves along our shores and the countless stars that light the night sky awaken within us a natural curiosity about the world we live in. It is this wonder that marks the beginning of learning.

Our Common Home was born from that simple conviction. Prepared to commemorate the **800th Anniversary of the Transitus of St. Francis of Assisi (1226–2026)**, this handbook is an invitation to young learners to discover the beauty, richness and interconnectedness of the natural world. While inspired by the universal values exemplified by St. Francis—wonder, simplicity, gratitude, peace and care for all creation—this handbook has been written for every child, every family, every school and every community, irrespective of faith or background. Our shared home belongs to us all, and its care is a shared responsibility.

The vision of this handbook extends beyond the classroom. We hope it will become a companion for students, a teaching resource for educators, a conversation starter within families, a practical guide for Eco Clubs and nature groups, and an inspiration for communities striving to build a more sustainable future.

Rather than presenting ecology as a collection of scientific facts alone, this handbook seeks to cultivate observation, understanding and responsible action. It encourages children to ask questions, appreciate the diversity of life, recognise the relationships that sustain our planet and discover how even the smallest daily actions can contribute to a healthier Earth.

The eighteen chapters take readers on a journey—from the wonders of air, water, soil and sunlight to forests, wildlife, biodiversity, eco-systems, climate, sustainability, renewable energy and our shared responsibility for the future. Each chapter combines scientific knowledge with practical activities, reflection and hope, helping young readers understand not only how nature works but also why it deserves our care.

This publication is also a heartfelt tribute to the late **Rev. Dr. Bolmax Pereira**, whose unwavering commitment to the protection of Goa's environment inspired countless people. As a priest, educator, environmental activist and visionary leader, he demonstrated that genuine love for one's homeland is expressed through the protection of its rivers, forests, coastlines, biodiversity and communities. His legacy continues to inspire this work.

No meaningful educational resource is ever the achievement of one person alone. This handbook is the result of the generous collaboration of educators, scientists, environmentalists, artists, Church leaders, government officials, volunteers and many friends of creation who have shared their knowledge, experience and encouragement. Before publication, each chapter was reviewed by specialists in its respective field so that the handbook reflects sound science, educational relevance and practical value. I express my sincere gratitude to every contributor who has helped shape this shared endeavour.

I am especially grateful to the Archdiocese of Goa and Daman, the Diocesan Commission for Ecology, St. Anne's Parish, Ponda, our partner institutions and all those who have supported this initiative with their time, expertise and unwavering commitment to caring for creation.

As you turn these pages, I invite you not simply to read this handbook, but to experience it. Observe the world around you. Listen to the songs of birds. Feel the richness of the soil. Watch a butterfly at work. Plant a tree. Protect a river. Reduce waste. Share what you learn with others. Every small act of care strengthens the future of our common home.

The Earth has entrusted us with extraordinary gifts. May we receive them with gratitude, use them wisely and pass them on with love to future generations. I warmly welcome you to this journey.

Dr. Kennedy Joseph D'Silva
Convener

The Five Principles
of Our Common Home

These five principles will guide your journey through this handbook.
Let them inspire the way you see, think, feel and act
every day for our common home.

WONDER – Open your eyes.

Look closely at the beauty of creation.
Listen to the birds, watch butterflies dance among flowers,
feel the cool rain, notice the changing seasons
and marvel at the countless forms of life around you.

Every great discovery begins with wonder.

UNDERSTAND – Open your mind.

Ask questions. Explore. Observe. Learn how forests grow,
rivers flow, bees pollinate flowers and ecosystems
work together.

Knowledge helps us make wise decisions.

CARE – Open your heart.

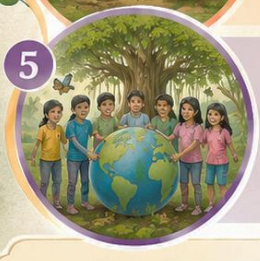
Respect every form of life, whether great or small.
Care for people, animals, plants and the places we all share.

When we care for nature,
we also care for one another.

ACT – Open your hands.

Plant a tree. Save water. Reduce waste.
Reuse what you can. Protect wildlife.
Share what you have learned with others.

Small actions, repeated every day,
can change the world.



INSPIRE – Open the future.

Lead by example. Encourage your family, friends,
classmates and community to care for our common home.
Your choices today can inspire many others tomorrow.

The greatest leaders are those
who inspire hope through their actions.

YOUR PROMISE

I will **WONDER.** | I will **UNDERSTAND.** | I will **CARE.** | I will **ACT.** | I will **INSPIRE.**

Together, we can protect and celebrate our common home
for generations to come.

LET US LOVE • LET US LEARN • LET US CARE • LET US ACT • LET US INSPIRE

OUR COMMON HOME

Introduction
"Every Child. Every School. Every Future."

Our Mission; To inspire young people to understand, appreciate and protect the natural world through scientific knowledge, practical action, universal values and hope. This handbook seeks not merely to inform students, but to nurture a generation of responsible citizens who recognise that caring for our common home is both a privilege and a shared responsibility.

Our Guiding Principles

1. Scientifically Accurate; Every fact will be carefully researched and verified. Students should be able to trust every page.
2. Easy to Understand; Complex scientific ideas will be explained using simple language suitable for students of Classes VIII–X. If a child cannot understand it, we rewrite it.
3. Beautiful to Read; Every chapter should invite curiosity. Children should enjoy turning the next page.
4. Inclusive; This handbook belongs to everyone. Students from every school, every community and every faith tradition should feel welcomed. Nature belongs to all.
5. Hopeful; We will never frighten children into caring. Instead, we will inspire them. Every environmental problem will be accompanied by practical solutions.
6. Practical; Every chapter should encourage action. Not someday. Today.
7. Goa First; Whenever possible we will use examples from Goa. Children protect what they know.
8. India Proud; Students should appreciate India's remarkable biodiversity and environmental heritage.
9. Globally Responsible; Young readers should recognise that they are citizens of one planet.
10. Timeless; This handbook should remain useful ten and twenty years from now.

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Opening the Journey

Part I – Discovering Our Common Home

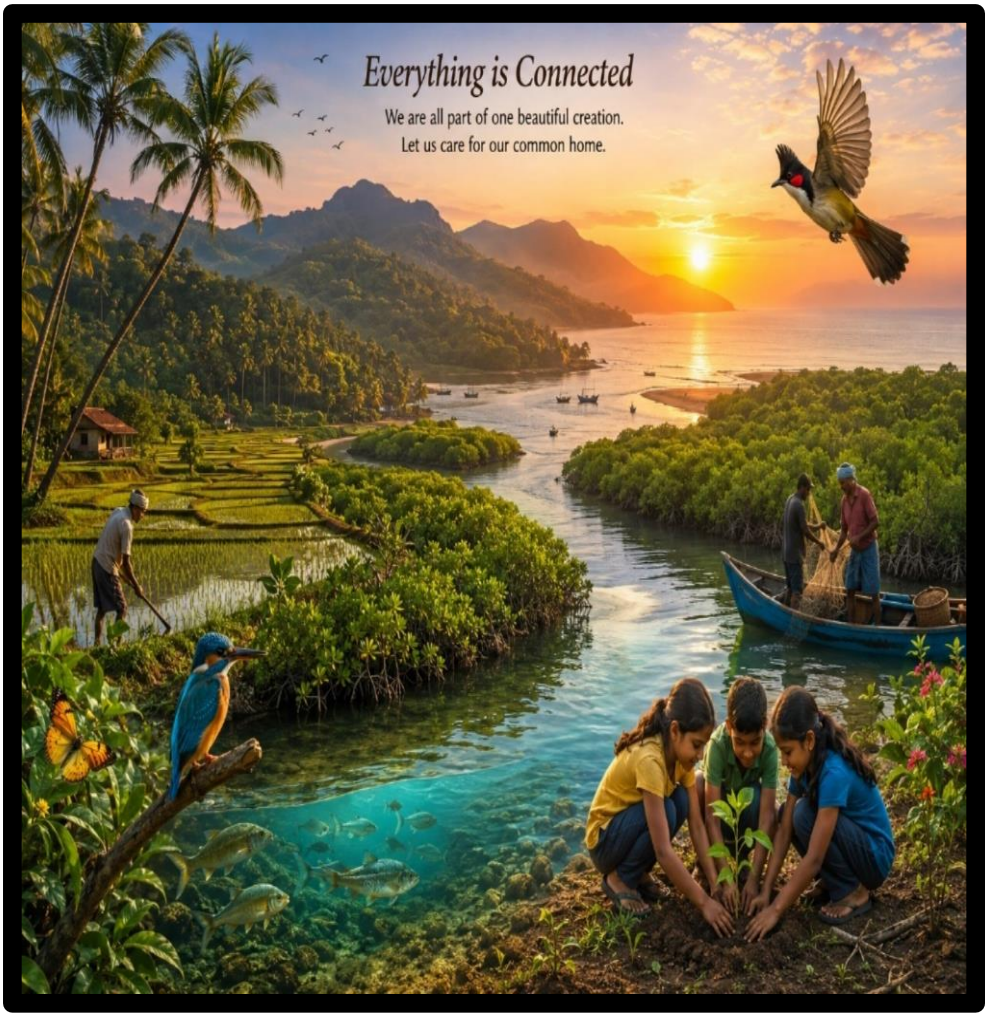
Part II – Celebrating the Diversity of Life

Part III – Caring for Our Common Home

Continuing the Journey

CHAPTER 1
WHAT IS ECOLOGY?

Opening Thought; *"When we care for nature, we are caring for ourselves, because every breath we take, every drop of water we drink, and every meal we enjoy depends upon the health of our common home."*



A Morning Walk

One cool morning during the monsoon, Asha and Rohan walked with their science teacher to the edge of a small river near their village. The air smelled fresh after the night's rain. Dewdrops sparkled on the grass. Tiny spiders had woven beautiful webs between the bushes. Dragonflies skimmed across the water, while a white egret stood patiently in the shallows waiting for a fish. "Listen carefully," their teacher said. The children became quiet. They heard birds singing from the trees. They heard the flowing river. They heard bees buzzing around flowers. They heard the wind gently moving through the leaves. Then their teacher asked a simple question. "Which of these is the most important?" The students looked at one another. "The birds?" one suggested. "The river?" another replied. "The trees?" said someone else. Their teacher smiled. "The answer is... none of them by themselves." The children looked puzzled. She bent down and picked up a fallen leaf. "If there were no trees," she explained, "many birds would lose their homes." "If there were no bees, many flowers would not produce fruits." "If there were no rivers, animals, plants and people would struggle to survive." "If there were no earthworms, the soil would become less fertile." "If there were no tiny insects and fungi, fallen leaves would never decompose and return nutrients to the soil." She gently placed the leaf back on the ground. "Nature is like a great orchestra. Every plant, every animal, every insect, every stream, every cloud and every person has a part to play. When one part is harmed, the whole orchestra is affected." At that moment, the children began to understand something they had never noticed before. **Everything in nature is connected.** That connection is called **ecology**.

The Learning Objectives; By the end of this chapter you will be able to:

✓ Explain what ecology means.

✓ Describe how living and non-living things depend upon one another.

✓ Understand that humans are part of nature.

✓ Recognise why protecting one part of nature helps protect many others.

✓ Identify simple actions you can take to care for your local environment.

What Does the Word "Ecology" Mean? The word **ecology** comes from two ancient Greek words: **Oikos** – meaning *home*. **Logos** – meaning *study* or *understanding*. So, ecology literally means: **"The study of our home."** Our home is not just the house in which we live.

Our real home includes the air we breathe, the rivers that provide water, the forests that produce oxygen, the soil that grows our food, the oceans that regulate our climate, and the countless living creatures with whom we share this planet. Ecology is the science that helps us understand these relationships and teaches us how to care for them.

Ecology in Simple Words; Ecology is the study of **how living things interact with one another and with their environment.** These living things include: People, Plants, Animals, Birds, Fish, Insects, Fungi, Tiny microorganisms. The environment includes: Air, Water, Soil, Sunlight, Temperature, Rocks, Climate. Every living thing depends upon these natural resources to survive.

Think About This; Imagine that one day all the bees disappeared. Would flowers produce as many seeds? Would farmers harvest as many fruits? Would birds and animals find enough food? Would people have enough food? A tiny insect affects an entire ecosystem. That is ecology in action.

Goa Spotlight; The Mangroves of Goa – Nature's Silent Guardians

Illustration; Mangrove roots rising from tidal waters, mudskippers, crabs, kingfishers and fishermen in a canoe. Along the banks of Goa's rivers grow special trees called **mangroves**. These remarkable forests protect the coastline from erosion, provide homes for fish, crabs and birds, improve water quality and store large amounts of carbon. When mangroves are healthy, nearby fishing communities also benefit because many young fish begin their lives among their roots before

moving into rivers and the sea. Protecting mangroves means protecting both nature and people.

Did You Know?

🌿 A single mature tree can support hundreds of different species of insects, birds, fungi and microorganisms.

🌎 Scientists estimate that millions of different species live on Earth, and many have yet to be discovered.

💧 Every drop of water you drink today has been part of Earth's water cycle for millions of years.

🦋 Butterflies "taste" with their feet before laying eggs on plants.

Vocabulary

Ecology – The study of relationships between living things and their environment.

Environment – Everything around us, both living and non-living.

Habitat – The natural home of a plant or animal.

Species – A group of living organisms that can reproduce with one another.

Biodiversity – The variety of living things found in an area.

THE WEB OF LIFE; Everything Is Connected Imagine standing high in the Western Ghats looking towards the Arabian Sea. At the top shines the Sun. Golden arrows show sunlight reaching the forests. Clouds form over the mountains and rain falls into rivers. The rivers flow through villages, farms and mangrove forests before reaching the sea. Along the way we see: Trees producing oxygen, Bees pollinating flowers, Butterflies visiting plants, Earthworms enriching the soil, Birds dispersing seeds, Frogs controlling insects, Fish swimming upstream, Farmers growing rice, Fisherfolk casting their nets, Children planting trees, Families collecting rainwater. Fine

connecting lines show how every part depends upon every other part. **"Nothing in nature lives alone."**

Nature Is Like a Giant Puzzle; Have you ever completed a jigsaw puzzle? Every piece has its own place. If even one important piece is missing, the picture is incomplete. Nature works in a similar way. Every plant, animal, insect, bird, fungus and microorganism has a role to play. Some creatures are easy to notice, such as elephants or dolphins. Others are so tiny that we cannot see them without a microscope. Yet every one of them contributes to keeping ecosystems healthy. Even a fallen leaf lying quietly on the forest floor becomes food for fungi, insects and tiny organisms. These break it down into nutrients that enrich the soil, helping new plants to grow. In nature, nothing is wasted. Everything has a purpose.

Ecology Around Your Home; You do not need to visit a national park to study ecology. Nature is already around you. Look carefully near your home or school. You may discover: Ants carrying food. A spider weaving its web. A squirrel collecting seeds. Butterflies visiting flowers. Bees pollinating plants. Moss growing on walls. Birds building nests. Earthworms in moist soil after rain. Every one of these is part of an ecosystem. The more carefully you observe nature, the more fascinating it becomes.

Why Should We Care? Sometimes people ask, "Why should I care about insects?" "Why should I care about forests?" "What difference can one river make?" The answer is simple. Because our own lives depend upon healthy ecosystems. Forests provide oxygen and store carbon. Rivers provide drinking water. Wetlands reduce flooding. Mangroves protect coast lines. Pollinating insects help produce many fruits and vegetables. Healthy soil grows healthy food. Nature is not separate from us. We are part of nature. When nature becomes healthier, people become healthier too.

Goa Spotlight; The Western Ghats – A Treasure of Life

The Western Ghats stretch for about 1,600 kilometres along the western side of India and pass through Goa. They are recognised as one of the

world's great biodiversity hotspots because thousands of plant and animal species live there, many of which are found nowhere else on Earth. The forests of the Western Ghats help capture rain, feed Goa's rivers, regulate the climate and provide habitat for wildlife. Many of the streams that supply drinking water to Goan towns and villages begin their journey in these forests. Protecting the Western Ghats means protecting Goa's future.

DID YOU KNOW?

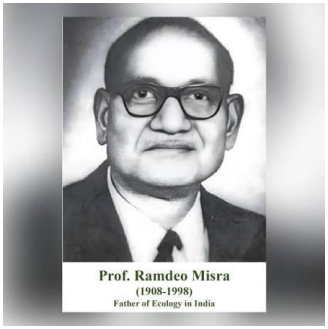
🌳 One mature tree can release enough oxygen each year to support the breathing needs of several people while also providing shade, storing carbon and creating habitat for wildlife.

🪱 A handful of healthy soil contains billions of living microorganisms that quietly recycle nutrients and keep ecosystems functioning.

🐝 Many crops depend on bees and other pollinators for successful fruit and seed production.

🌧️ Forests help influence rainfall by releasing water vapour into the atmosphere through a process called transpiration.

 State animal of Goa is Gaur



MEET AN ECO HERO Dr.Ramdeo Misra widely known as the **Father of Ecology in India**. Born in Uttar Pradesh, he earned his Ph.D. in Ecology from Leeds University, UK, in 1937. He built foundational ecology teaching and research programs at Banaras Hindu University (BHU) and Saugar University, shaping national environmental policies and training generations of scientists. He did a detail studies on grasslands and forests of India. **Eco Lesson; Great discoveries often begin by paying attention to ordinary things.** Take time to watch the biodiversity around your home or school. You may notice something that no one else has observed.

HANDS-ON ACTIVITY; Become a Nature Detective

Visit your school grounds, parish campus or neighbourhood for twenty minutes. Record your observations in a notebook.

What I Observed	Number Seen	Notes
Birds		
Butterflies		
Trees		
Flowering Plants		
Insects		
Other Animals		

After your observations, ask yourself: Which living thing surprised you the most? Why do you think it is important?

FAMILY CHALLENGE

Spend one evening with your family outdoors. It could be in your garden, along a village road, beside a river or in a local park. Together try to identify: Five different birds. Five different trees. Five insects. Three sounds of nature. Discuss how each contributes to the environment. Learning becomes richer when families explore nature together.

REFLECT

Read each statement carefully. Do you agree? Every living thing has value. Healthy forests benefit people. Rivers should remain clean. Small daily actions can protect nature. I can make a difference. If you answered "Yes" to these statements, you have already taken your first step towards becoming an Ecology Guardian.

QUIZ YOURSELF

1. What is ecology?
2. What does the word "ecology" literally mean?
3. Name three living components of an ecosystem.
4. Name three non-living components of an ecosystem.
5. Why are bees important?
6. Why are forests called the "lungs of the Earth"?

7. What is biodiversity?
8. Name one biodiversity hotspot found in Goa.
9. How do mangroves help coastal communities?
10. Write three actions you can begin this week to help protect nature.

"Pause... Look... Wonder..."

Tonight, before you go to bed, step outside for just two minutes. Look up at the stars, listen to the sounds around you, breathe deeply and remember that you are part of an extraordinary web of life that has been growing for millions of years.

CHAPTER 2
EARTH – OUR COMMON HOME

One Planet. One Home. One Future.

Opening Thought; *"Seen from space, Earth has no borders. It is one beautiful home shared by every person, every animal, every forest and every ocean."*

A Letter from Planet Earth

"Dear Young Friend," "For more than four billion years I have been your home." "I have given you mountains to climb, rivers to drink from, forests to breathe for you, oceans filled with life, fertile soil to grow your food, and skies filled with stars to inspire your dreams." "I ask for very little in return." "Protect my rivers." "Care for my forests." "Respect every living creature." "Use my gifts wisely." "If you care for me, I will continue caring for you." "Together, let us build a future filled with hope." - **Your Planet Earth**

A View That Changed the World

On 24 December 1968, three astronauts aboard the **Apollo 8** mission became the first humans to travel around the Moon. As their spacecraft emerged from behind the Moon, they saw something no human had ever seen before. Above the grey, lifeless lunar horizon rose a small, brilliant blue-and-white sphere. ***It was Earth***. One of the astronauts quickly photographed the scene. That famous image became known as **Earthrise**. For the first time, millions of people saw their home from space. There were no visible countries. No political boundaries. No walls. Only one beautiful planet floating in the darkness of space. That photograph inspired people around the world to think differently about the environment. Many historians believe it helped strengthen the modern environmental movement by reminding humanity that we all share one fragile home.

Learning Objectives; By the end of this chapter, you will be able to:

✓ Describe the Earth's place in the Solar System.

✓ Explain why Earth is unique.

✓ Understand the importance of the atmosphere, water and suitable temperatures for life.

✓ Recognise that all people share one common home.

✓ Appreciate why protecting Earth is everyone's responsibility.

Our Place in Space; Earth is one of **eight planets** that orbit the Sun. It is the third planet from the Sun and the fifth largest in our Solar System. From space, Earth appears blue because about **71% of its surface is covered by water**. The remaining **29%** consists of continents, islands, mountains, forests, deserts, rivers and lakes. This combination of land, water and atmosphere creates the conditions necessary for life to flourish.

Why Is Earth So Special? Scientists have discovered thousands of planets beyond our Solar System. Yet, among all those worlds, Earth remains extraordinary. It has the right distance from the Sun, often called the **"Goldilocks Zone"**—not too hot and not too cold. It has abundant liquid water. Its atmosphere contains oxygen for most living organisms and helps protect life from harmful solar radiation. Its gravity is strong enough to hold the atmosphere close. Its magnetic field shields the planet from many charged particles coming from the Sun. Together, these conditions have allowed life to develop and evolve for billions of years. Earth is not just a planet. It is a living world.

The Four Great Spheres of Earth; Everything on Earth is connected through four major systems.

1. The Atmosphere; The blanket of gases surrounding Earth. It provides the air we breathe and helps regulate temperature.
2. The Hydrosphere; All the water on Earth—oceans, rivers, lakes, glaciers, groundwater and water vapour.
3. The Lithosphere; The solid outer layer of Earth, including rocks, mountains, soil and landforms.
4. The Biosphere; The living world—all plants, animals, fungi and microorganisms. Together, these four spheres interact continuously to sustain life.

Goa Spotlight —A Small State with Remarkable Natural Wealth Although Goa is India's smallest state by area, it is rich in natural diversity. Within a relatively short distance, you can travel from the forests of the Western Ghats to fertile farmlands, winding rivers, mangrove ecosystems and the Arabian Sea. This variety of landscapes supports an extraordinary range of plants, animals and livelihoods.

Protecting Goa's natural heritage means protecting clean water, healthy forests, fisheries, agriculture, tourism and the well-being of future generations.

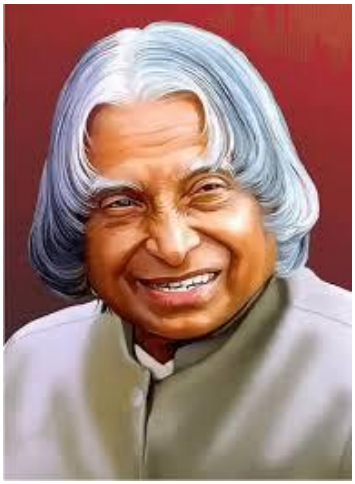
DID YOU KNOW?

🌍 Earth is about **4.54 billion years old**.

🌊 More than two-thirds of Earth's surface is covered by water, but only a small percentage is readily available as fresh water for human use.

🌬️ The atmosphere is only a thin layer compared with the size of the Earth, yet it makes life possible.

🛰️ Hundreds of satellites orbit Earth, helping us communicate, predict weather, study climate and respond to natural disasters.



MEET AN EARTH HERO; Dr. A. P. J. Abdul Kalam Scientist, engineer and former President of India. Dr. Kalam believed that science should improve people's lives and inspire young minds to dream. He encouraged students to remain curious, to ask questions and to work together for a better future. **His Message; "Dream is not that which you see while sleeping; it is something that does not let you sleep."** Let your dream include a healthier planet.

ACTIVITY; Build Your Own Living Earth Using coloured paper or modelling clay, create a model of the Earth showing: Oceans, Continents, Atmosphere, Forests, Rivers, Mountains. Label each of the four Earth systems. Discuss how they work together to support life.

FAMILY CHALLENGE; Stand outside together one evening. Look towards the sky. Imagine how Earth appears from space. Then ask one another: **"If an astronaut visited our neighbourhood tomorrow,**

what would make them proud? What could we improve?" Choose one practical action your family will take this month to care for your common home.

PAUSE... LOOK... WONDER...

Tonight, step outside after sunset. Look at the Moon. Remember that astronauts standing there once looked back and saw Earth rising above the horizon. For them, our planet was not just another world. It was home. Take one deep breath. That breath is a gift from the living Earth. Treasure it.

CHAPTER 3
LIVING WATERS

The Story of Every Drop

"Every drop has a journey. Every drop has a story. Every drop has life." A single crystal-clear drop of water hangs from the tip of a green leaf after the first monsoon rain. Inside the drop, like a tiny mirror, are reflected: Snow-capped mountains, Clouds, Rain, Rivers, Waterfalls, Mangrove forests, Paddy fields, Coconut palms, Fish, Birds, Butterflies, Farmers, Children collecting rainwater, The Arabian Sea. **"Without water, there is no life."**

The Amazing Journey of Tara – A Little Drop of Water

"My name is Tara. I may be tiny, but my journey is older than human history. Millions of years ago, I floated high above the Earth as part of a cloud. The wind carried me across mountains and oceans until one cool morning I fell gently as rain. I landed on a leaf deep inside a forest. Soon I trickled into a stream. The stream joined a river. The river carried me towards the sea. The warm Sun lifted me back into the sky. Again I became a cloud. Sometimes I have been snow upon a mountain. Sometimes I have hidden beneath the ground as groundwater. Sometimes I have travelled through the roots of a great banyan tree. Sometimes I have become part of a juicy mango. Today I may be the water inside your drinking bottle. Tomorrow I may become rain once again. My journey never ends. I am only one little drop, yet every living thing depends on me."

Pause... Think... Wonder...

Hold a glass of water in your hands. Look at it carefully. The water you are holding may once have fallen as rain over the Western Ghats, flowed through the River Mandovi, travelled across the Arabian Sea, rested inside a coconut tree, been part of a cloud over the Himalayas or quenched the thirst of an animal many years ago. Water is always moving. It changes form, but it never stops its journey.

Learning Objectives; By the end of this chapter you will be able to:

✓ Explain why water is essential for life.

✓ Describe the water cycle.

✓ Understand the difference between freshwater and saltwater.

✓ Recognise the importance of rivers, lakes and wetlands.

✓ Identify ways to conserve water at home, school and in your community.

Why Is Water So Special? Water is the most important natural resource on Earth. Every plant, animal and human being depends upon it. Without water seeds cannot grow, forests cannot survive, animals cannot drink, rivers would disappear, people could not live. Water makes life possible. That is why scientists often search for water when looking for life on other planets. Where there is water, there is the possibility of life.

Water and Our Bodies; Did you know that your body is made mostly of water? Water helps to carry nutrients, regulate body temperature, digest food, remove waste, keep the brain, muscles and organs healthy. Even mild dehydration can make us feel tired and unable to concentrate. Drinking enough clean water each day keeps our bodies healthy.

Water in Nature; Water is everywhere. It exists as Oceans, Rivers, Lakes, Streams, Ponds, Glaciers, Groundwater, Clouds, Rain, Snow, Ice, Water vapour. It is also found inside every living organism. Plants, animals and people all contain water.

Freshwater – A Precious Gift; Although about 71% of Earth is covered by water, nearly all of it is salty ocean water. Only a small portion is freshwater. Much of this freshwater is frozen in glaciers or stored underground. The water available in rivers, lakes and reservoirs is limited. This is why every drop matters. Saving water today helps ensure there is enough for tomorrow.

The Water Cycle; Water is constantly moving around our planet. This never-ending journey is called the **Water Cycle**. It has four main stages.

1. Evaporation; The Sun heats oceans, lakes and rivers. Water changes into invisible water vapour and rises into the atmosphere.

2. Condensation; High in the atmosphere, water vapour cools and forms tiny droplets. These droplets gather to form clouds.

3. Precipitation; When clouds become heavy, water falls back to Earth as rain, snow or hail.

4. Collection; Rainwater collects in rivers, lakes, wetlands, groundwater and oceans. Then the journey begins again. Nature wastes nothing. Water keeps travelling in an endless cycle.

Goa Spotlight; Rivers That Give Life Goa is blessed with many beautiful rivers. Among the most important are Mandovi, Zuari, Khandepar, Chapora, Terekhol, Sal, Talpona, Galgibaga. These rivers provide drinking water, support farming, help fishermen earn their livelihood, nourish mangrove forests, provide habitats for fish, birds and wildlife, enrich Goa's culture and history. Healthy rivers mean healthy communities. Nanda Lake is the first Ramsar site in Goa. It is large wetland situated in Curchorem.

Wetlands – Nature's Water Filters; Wetlands are areas where land remains wet for part or all of the year. They include marshes, ponds, mangroves and floodplains. Wetlands help to store rainwater, reduce flooding, clean polluted water, provide homes for birds and fish, recharge groundwater. They are among the most valuable ecosystems on Earth.

Water Pollution; Water becomes polluted when harmful substances enter rivers, lakes or oceans. Common causes include Plastic waste, Sewage, Industrial waste, Agricultural chemicals, Oil spills, Dumping of garbage. Polluted water harms fish, birds, animals and people. Keeping water clean is everyone's responsibility.

Meet an Eco Hero; Rajendra Singh – The Waterman of India

Rajendra Singh is known throughout India for helping communities restore rivers and harvest rainwater. Working together with villagers, he helped revive many rivers that had almost dried up. His work reminds us that ordinary people can achieve extraordinary results when they work

together. **His Message** *"Protect water, and water will protect life."*

Did You Know?

💧 A person can survive several weeks without food but only a few days without water.

🌧️ The same water that falls as rain today may have been circulating through Earth's water cycle for millions of years.

🐘 An elephant may drink more than 100 litres of water in a single day.

🌳 Forests help protect rivers by slowing rainwater, reducing soil erosion and allowing water to soak into the ground.

Hands-on Activity; Become a Water Detective

For one day, record every time you use water. Think about drinking, cooking, bathing, washing clothes, cleaning, watering plants.

Now ask yourself: Which uses were necessary? Where could I save water? Write down three ways you will reduce water wastage this week.

Family Challenge; As a family:

✓ Check every tap in your house for leaks.

✓ Collect rainwater for watering plants.

✓ Reuse water where it is safe to do so.

✓ Turn off the tap while brushing your teeth.

✓ Water plants early in the morning or late in the evening.

Small actions, repeated every day, make a big difference.

Quiz Yourself

1. Why is water called the source of life?
2. What percentage of Earth's surface is covered by water?
3. What is the difference between freshwater and saltwater?
4. Name the four stages of the water cycle.
5. Why are wetlands important?
6. Name four rivers of Goa.

7. List three causes of water pollution.
8. How do forests help protect water?
9. Name one thing you can do every day to save water.
10. Why is every drop of water valuable?

Pause... Look... Wonder...

The next time it rains, do not rush indoors. Stand quietly for a moment. Listen to the raindrops. Feel the cool breeze. Watch the water flow across the ground. Remember that every river, every lake, every forest and every living creature depends upon this precious gift. Every drop that falls from the sky carries hope. May every drop remind us to care for our common home.

CHAPTER 4
AIR – THE BREATH OF LIFE

The Invisible Gift That Connects Every Living Thing

"The most precious things in life are often the ones we cannot see."

A young girl stands on a hill at sunrise in Goa. She closes her eyes and takes a deep breath. Around her, although invisible, the artist gently illustrates movement in the air, leaves dancing in the breeze, butterflies gliding, birds soaring, seeds floating, clouds drifting, kites flying, windmills turning, waves rolling onto the shore. Soft rays of morning

sunlight pass through the atmosphere, bathing the landscape in warm golden light. **"Every breath is a gift shared by the whole Earth."**

The Boy Who Tried to Catch the Wind

One afternoon, twelve-year-old Aaron stood on the beach at Miramar with his grandfather. The sea breeze was strong. Palm trees swayed gently. Fishing boats rocked upon the waves. Seagulls floated effortlessly in the sky. "Grandpa," Aaron asked, "where is the wind?" His grandfather smiled. "You can feel it," he replied. "You can hear it." "You can see what it does." "But you cannot hold it in your hands."

Aaron stretched out both hands and tried to catch the wind. Nothing. He laughed. Then his grandfather asked another question. "Can you see the air you are breathing?" Aaron shook his head. "No." "Yet without it," Grandpa said softly, "we could not live for more than a few minutes." Aaron suddenly realised something extraordinary. Some of life's greatest gifts are invisible. The air around us is one of them.

Pause... Think... Wonder...

Take one slow, deep breath. Now breathe out. You have just done something your body has been doing every moment since you were born. Without thinking. Without stopping. Thousands of times every day. Each breath reminds us that life is a continuous gift.

Learning Objectives; By the end of this chapter you will be able to:

✓ Explain what air is.

✓ Describe the major gases in the atmosphere.

✓ Understand why oxygen is essential for life.

✓ Explain how plants and animals exchange gases.

✓ Recognise the causes and effects of air pollution.

✓ Discover simple ways to keep the air clean.

What Is Air? Although we cannot see it, air is all around us. It fills our lungs every time we breathe. It surrounds every mountain, forest, river and ocean. Air is a mixture of gases that forms Earth's atmosphere. The atmosphere is like a thin blanket wrapped around our planet. It protects life, keeps Earth warm enough for living things, and filters much of the harmful radiation coming from the Sun. Without this invisible blanket, Earth would be a cold, lifeless world.

What's in the Air? Air is made up of several gases. The main ones are **Nitrogen (about 78%)** – Helps plants grow by becoming part of the natural nitrogen cycle. **Oxygen (about 21%)** – Essential for most living organisms to breathe. **Argon (about 1%)** – A naturally occurring gas that is present in small amounts. **Carbon dioxide (less than 1%)** – Though present in a small quantity, it is vital because plants use it to make food through photosynthesis. Air also contains water vapour, tiny particles of dust and microscopic organisms. Every breath we take is a mixture carefully balanced by nature.

The Amazing Journey of a Breath; When you breathe in Oxygen enters your lungs. It passes into your bloodstream. Your blood carries it to every cell in your body. Your cells use oxygen to release energy from the food you eat.
When you breathe out Carbon dioxide leaves your body. Plants absorb this carbon dioxide. Through photosynthesis, they use sunlight to make food and release fresh oxygen back into the air.
This beautiful exchange reminds us that plants and people depend on one another.

Trees – Nature's Green Lungs; Trees are among our greatest allies. They produce oxygen, absorb carbon dioxide, cool the environment, reduce air pollution, provide shade, support wildlife, help regulate rainfall. Every tree is like a silent worker serving life every day. Planting and protecting trees is one of the simplest and most powerful ways to care for our common home.

Goa Spotlight; Breathing with the Forests The forests of Goa's Western Ghats are often called the "green lungs" of the state. These forests clean the air, protect wildlife, conserve water and help regulate the local climate. They also support many communities by providing clean water, medicinal plants and opportunities for sustainable livelihoods. When forests are healthy, the air we breathe becomes healthier too.

Did You Know?

🌬️ An average person takes around **20,000 breaths every day**.

🌳 A large healthy tree can help improve local air quality by trapping dust and other pollutants on its leaves.

🕊️ Birds often soar on warm rising air currents, using very little energy.

🌍 Earth's atmosphere extends hundreds of kilometres above the surface, but most of the air we breathe is concentrated in the lowest layer, called the **troposphere**.

State tree of Goa is Crocodile bark tree (Terminalia elliptica)

Air Pollution; Air pollution occurs when harmful substances enter the atmosphere. Common sources include vehicle exhaust, burning garbage, factory emissions, forest fires, dust, smoke from burning fuels. Polluted air can affect our lungs, heart and overall health. It also harms plants, animals and ecosystems. Clean air is essential for healthy communities.

Meet an Eco Hero; Dr. Wangari Maathai (1940–2011)

A scientist and environmental leader from Kenya, Dr. Wangari Maathai founded the Green Belt Movement, through which millions of trees were planted to restore degraded landscapes and improve communities. She believed that planting a tree was an act of hope for the future. Her work reminds us that caring for the environment begins with simple actions taken by ordinary people.

Hands-on Activity; Become an Air Explorer Choose two places a busy roadside, a park, school garden or wooded area. Spend ten minutes in each location.

Observe: How does the air feel? What can you smell? What sounds do you hear? How many birds or butterflies do you notice? Discuss why the two places feel different.

Family Challenge; Spend one evening without using a vehicle if possible. Walk or cycle together to a nearby place. Notice the evening breeze, the sounds of birds, the fragrance of flowers, the movement of leaves. Talk about how cleaner air improves everyone's quality of life.

My Clean Air Pledge; I promise to never burn waste unnecessarily, plant and care for trees, walk or cycle whenever possible, help keep my surroundings clean, encourage others to protect the air we all share.

Quiz Yourself

1. What is air?
2. Which gas makes up most of the atmosphere?
3. Why is oxygen important?
4. What do plants use carbon dioxide for?
5. What is photosynthesis?
6. Name three benefits of trees.
7. List four causes of air pollution.

8. Why is the atmosphere often called Earth's protective blanket?
9. What can you do to reduce air pollution?
10. Why should we protect forests?

Pause... Look... Wonder...

Stand beneath a large tree. Close your eyes. Take a slow, deep breath. Imagine the long journey of that breath—from sunlight to leaf, from leaf to air, from air to your lungs. The breath that gives you life is a gift shared with forests, oceans, animals and every person on Earth. Protect the air. Protect life.

CHAPTER 5
SOIL – THE LIVING SKIN OF THE EARTH

The Hidden World Beneath Our Feet

"The greatest treasures of the Earth are often hidden beneath our feet."

A young child kneels in a garden after the first monsoon rain, gently holding a handful of rich, dark soil. The illustration is shown as a "cutaway" view. Above the ground we see towering trees, flowering plants, butterflies, birds, vegetables, children harvesting crops.

Below the ground, a hidden world comes alive earthworms making tunnels, roots reaching deep into the soil, fungi connecting plants, tiny insects, beetles, microorganisms, water moving slowly through the earth, seeds beginning to germinate.

"Healthy soil is the beginning of every healthy forest, every healthy farm and every healthy community."

The Treasure Beneath the Mango Tree

One summer morning, Maya watched her grandfather preparing the soil beneath an old mango tree. He gently mixed fallen leaves, compost and moist earth with his hands. Curious, Maya asked, "Grandpa, why do you spend so much time looking after the soil? Wouldn't it be easier just to water the tree?" Grandfather smiled. He scooped up a handful of dark soil and placed it in her hands. "What do you see?" "Dirt," Maya replied. Grandfather shook his head. "I see a living city." He pointed carefully. "There are tiny insects you cannot easily see." "There are fungi helping the roots." "There are earthworms making tunnels." "There are billions of microscopic organisms breaking down old leaves into nutrients." "This handful of soil is alive." Maya looked more closely. For the first time, she realised that the ground beneath her feet was not lifeless at all. It was one of the busiest places on Earth.

Pause... Think... Wonder...

Walk barefoot on soft ground. Feel the cool earth beneath your feet. Beneath every step lies an entire world of life that quietly feeds forests, farms and families. Most of its workers will never be seen. Yet every meal we eat depends upon them.

Learning Objectives; By the end of this chapter you will be able to:

✓ Explain what soil is.

✓ Understand how soil is formed.

✓ Describe the living organisms found in healthy soil.

✓ Recognise the importance of soil for food, forests and biodiversity.

✓ Identify ways to protect and improve soil.

What Is Soil? Soil is much more than dirt. It is a living mixture of tiny pieces of rock, water, air, minerals, decaying leaves and plants, fungi, bacteria, insects, earthworms, countless other living organisms. Healthy soil provides plants with water, nutrients and support. Without healthy soil, forests cannot thrive, crops cannot grow and many animals lose their habitats. Soil is one of Earth's greatest natural resources.

How Is Soil Formed? Soil forms very slowly. Over hundreds and often thousands of years rocks break down because of wind, rain and changing temperatures, fallen leaves and dead plants decompose, microorganisms recycle nutrients, earthworms and insects mix the soil, roots help hold everything together. Nature patiently builds soil grain by grain. That is why healthy soil should never be taken for granted.

Soil Is Alive; A teaspoon of healthy soil may contain billions of microscopic living organisms. These include bacteria, fungi, algae, protozoa, nematodes, tiny insects. Together they recycle nutrients, break down dead plants, improve soil structure, help roots absorb water, support healthy plant growth. Healthy soil is one of the richest ecosystems on Earth.

Earth's Great Recyclers; One of the heroes of healthy soil is the humble earthworm. Earthworms loosen compacted soil, improve drainage, mix organic matter, increase soil fertility. Because of their valuable work, earthworms are often called **"Nature's Farmers."** Fungi also play an extraordinary role. Their thread-like networks

connect plant roots, helping many plants share water and nutrients. Scientists sometimes call this the **"Wood Wide Web"** because these underground fungal networks help connect forests in remarkable ways.

Why Healthy Soil Matters; Healthy soil gives us food, forests, medicines, clean water, wildlife habitats, beautiful gardens, healthy ecosystems. Almost every meal we eat begins in healthy soil. When we protect the soil, we protect life itself.

Goa Spotlight; Goa's Farms, Forests and Red Earth

Goa's landscape is known for its rich laterite hills, fertile river valleys and lush paddy fields. Farmers carefully prepare the soil before planting rice, vegetables, fruits and spices. The forests of the Western Ghats also depend on healthy soils that store water, nourish trees and support an incredible diversity of life. Traditional practices such as composting, mulching and using natural manure help maintain soil fertility while protecting the environment. Goa laterite plateau are biodiversity hotspot, they act as sky islands-isolated ecosystem with unique flora. They also recharge ground water. Healthy soil is one of Goa's greatest natural treasures.

Soil Under Threat; Healthy soil can be damaged by excessive use of chemicals, deforestation, erosion, littering, plastic pollution, overgrazing, careless construction, burning vegetation unnecessarily. Once fertile soil is lost, nature may need many years to replace it. Protecting soil is far easier than restoring it.

Meet an Eco Hero; Sir Albert Howard (1873–1947)

Often called one of the pioneers of modern organic farming, Sir Albert Howard spent many years studying agriculture in India. He observed that healthy soil produces healthy plants, healthy animals and healthy people. His work inspired farming methods that respect nature by returning organic matter to the soil instead of exhausting it. **His Message** Healthy soil is the foundation of healthy life.

Did You Know?

🪱 Earthworms can improve soil by creating tunnels that allow air and water to reach plant roots.

🍂 Fallen leaves are not waste—they become valuable compost that enriches the soil.

🌾 Healthy soil stores water like a sponge, helping crops survive during dry periods.

🌍 It may take hundreds of years for nature to create just a few centimetres of fertile topsoil.

Hands-on Activity; Become a Soil Scientist Collect a small sample of soil from your garden, a school playground, a farm or beneath a tree. Observe carefully. Can you find roots, tiny stones, leaves, insects, earthworms, moisture. Write down what you discover. What makes one soil sample different from another?

Family Challenge; Start a small compost basket or compost pit at home. Collect vegetable peels, fruit waste, dry leaves, grass cuttings. Watch how nature slowly changes these materials into rich compost. This compost can nourish your garden instead of becoming waste.

My Soil Pledge; I promise to never throw plastic into fields or gardens. Help make compost from organic waste. Plant trees and protect green spaces. Respect farmers and those who care for the land. Protect the soil that feeds my family.

Quiz Yourself

1. What is soil made of?
2. Why is soil called a living ecosystem?
3. Name four living organisms found in healthy soil.
4. How are earthworms helpful?
5. What is compost?
6. Why does soil take so long to form?
7. Name three threats to healthy soil.
8. How do forests benefit from healthy soil?
9. What can families do to improve soil at home?
10. Why is healthy soil important for our future?

The Gift Box - God's Gift to Us: Soil

Soil is a quiet gift. It asks for no applause. Yet from it come our food, our forests, our flowers and many of the medicines that heal us. When we care for the soil, we honour the gift of life that it quietly sustains every day.

Pause... Look... Wonder...

Pick up a handful of soil. Hold it gently. Think of the seeds it has helped to grow. Think of the forests it has supported. Think of the meals it has made possible. Then place it back on the ground with gratitude. The soil beneath your feet is not merely earth. It is the living skin of our common home.

CHAPTER 6
SUNLIGHT – NATURE'S ENERGY

The Light That Powers Life

"Every sunrise is a new beginning, and every ray of sunlight is a gift that keeps our world alive."

The first rays of the morning Sun rise over the Western Ghats. Golden light spreads across forests, rivers, paddy fields and villages. A farmer begins work in the field. Birds leave their nests. Butterflies open their wings. Flowers bloom. Children walk to school. A spider's web glistens

with dew. Solar panels quietly begin producing electricity. Everything seems to awaken together.

"When the Sun rises, the whole Earth comes alive."

The First Sunrise

During the school holidays, Meera stayed with her grandparents in a village near the foothills of the Western Ghats. One morning, her grandmother gently woke her before dawn. "Come," she whispered, "there is something I want you to see." Still sleepy, Meera followed her outside. The world was quiet. The stars slowly faded. The eastern sky changed from deep blue to soft orange. Then, almost silently, the first rays of the Sun appeared above the hills. Within minutes, everything began to change. Birds started singing. Flowers slowly opened. Butterflies fluttered across the garden. Mist rose gently from the fields. The leaves sparkled with tiny drops of dew. Grandmother smiled. "Did you notice?" Meera nodded. "It is as though the whole world has woken up." "Exactly," Grandmother replied. "The Sun does much more than give us daylight." "It wakes life itself."

Pause... Think... Wonder...

Tomorrow morning, wake up just ten minutes earlier than usual. Stand outside. Watch the first sunlight touch the trees. Listen to the birds. Notice how the world slowly comes alive. Every sunrise is a lesson in hope.

Learning Objectives; By the end of this chapter you will be able to:

✓ Explain why the Sun is Earth's main source of energy.

✓ Understand how sunlight supports plants and animals.

✓ Describe photosynthesis in simple terms.

✓ Explain how sunlight influences weather and the water cycle.

✓ Recognise the importance of using sunlight wisely through renewable energy.

Our Nearest Star; The Sun is a star—a huge ball of hot gases at the centre of our Solar System. It is about **150 million kilometres** from Earth, yet its light reaches us in just over **8 minutes**. The Sun provides light, warmth, energy. Without it, Earth would be a frozen, dark and lifeless planet. Every day, the Sun generously shares its energy with all living things.

Sunlight and Life; Sunlight helps plants make their own food through a remarkable process called **photosynthesis**. During photosynthesis plants absorb sunlight, roots take in water, leaves absorb carbon dioxide from the air, plants produce food for growth, oxygen is released into the atmosphere. This simple process feeds nearly every food chain on Earth and replenishes the oxygen we breathe. Every leaf is like a tiny solar-powered kitchen.

The Sun and the Water Cycle; Think back to Chapter 3. The Sun gently warms oceans, rivers and lakes. Water evaporates into the atmosphere. Clouds form. Rain falls. Rivers flow. Without the Sun's energy, the water cycle would stop. The chapters of this handbook are now beginning to connect: Sunlight powers the water cycle. Water nourishes the soil. Healthy soil supports plants. Plants produce oxygen. Animals and people breathe that oxygen. Nature works as one interconnected system.

Day, Night and the Seasons; Earth spins on its axis once every 24 hours. As it rotates one side faces the Sun and experiences day, the other side faces away and experiences night. Earth also travels around the Sun once every year. Because Earth's axis is slightly tilted, different parts of the planet receive varying amounts of sunlight during the year, creating the seasons.

In Goa, we experience Summer, Monsoon and Winter. Each season brings its own beauty and importance.

Goa Spotlight; Living with the Sun Goa enjoys abundant sunshine for much of the year. Sunlight supports agriculture, coconut plantations, cashew orchards, drying of spices and fish, tourism, solar energy. Across the state, more homes, schools and public buildings are

beginning to use solar panels to generate clean electricity. Harnessing sunlight wisely helps reduce pollution and protects our common home.

Did You Know?

🌞 The Sun is about **109 times wider than Earth**.

🌿 Nearly every food chain on Earth begins with plants using sunlight.

🐝 Bees are most active during daylight because flowers open in the Sun.

⚡ In one hour, the Sun sends more energy to Earth than humanity uses in an entire year. Learning to capture even a small fraction of this energy can greatly benefit our future.

Meet an Eco Hero; Dr. M. S. Swaminathan (1925–2023)

Known as the "Father of India's Green Revolution," Dr. Swaminathan devoted his life to improving agriculture and food security while encouraging sustainable farming. He believed that science and respect for nature should work together to nourish people without harming the environment. His vision continues to inspire efforts toward sustainable agriculture in India.

Hands-on Activity; Build a Solar Journal For one week, observe the Sun. Record: What time does the Sun rise? Where is the warmest place in your home or school? Which plants receive the most sunlight? How do shadows change during the day? Draw or write what you discover.

Family Challenge; Spend one sunny afternoon identifying ways your family already uses sunlight. Can you: Dry clothes naturally? Grow vegetables? Use daylight instead of electric lights? Explore solar-powered devices? Discuss one additional way your family could make better use of clean solar energy.

The Gift Box; God's Gift to Us: Sunlight The Sun shines on forests and farms. On mountains and oceans. On villages and cities. On every person, without favour or discrimination. Its light reminds us that the greatest gifts are shared freely with everyone. May we receive this gift with gratitude and use it wisely.

Quiz Yourself

1. Why is the Sun important for life on Earth?
2. What is photosynthesis?
3. Which three ingredients do plants need for photosynthesis?
4. What useful gas do plants release during photosynthesis?
5. How does the Sun drive the water cycle?
6. Why do we have day and night?
7. Name the three main seasons experienced in Goa.
8. Give three uses of solar energy.
9. How can your family make better use of sunlight?
10. Why is the Sun called Nature's energy source?

Pause... Look... Wonder...

Tomorrow morning, stand where the first rays of the Sun touch your face. Remember that those rays have travelled across space for more than eight minutes before reaching you. They will warm the soil, lift water into the clouds, feed the green leaves, help flowers bloom, and give energy to every living creature. One sunrise. One world. One continuous gift.

CHAPTER 7
PLANTS – THE GREEN MIRACLE

Nature's Silent Builders of Life

"Every seed carries a promise. Every leaf is a tiny miracle. Every plant is a gift to the Earth."

A magnificent banyan tree stands in the centre of a village. Children read beneath its shade. Birds build nests among its branches. Butterflies dance around colourful flowers. Bees collect nectar. A squirrel climbs the trunk. A farmer rests after working in the fields. A grandmother gathers medicinal leaves. The roots spread deep into the living soil.

Above, the leaves glow in the morning sunlight. Tiny arrows show the invisible gifts the tree provides oxygen, food, shade, rain, shelter, medicines, beauty, life.

"A tree never eats its own fruit, nor drinks its own water. It lives by giving."

The Tiny Seed

One afternoon, twelve-year-old Joseph found a small seed lying beneath a mango tree. It was so small that he almost kicked it aside. His science teacher happened to be walking past. "What have you found?" she asked. "Just a seed," Joseph replied. The teacher smiled. "Just a seed?" She gently placed it in his hand. "Inside this tiny seed sleeps an entire tree." Joseph looked surprised. "A tree?" "Yes," she replied. "One day this little seed could become taller than your house." "It may feed birds." "It may give fruit to hundreds of people." "It may provide shade for travellers." "It may hold the soil together during heavy rains." "It may become home to insects, squirrels and butterflies." "It may even produce enough oxygen to support life around it." Joseph closed his hand around the seed. For the first time, he realised that the smallest things sometimes hold the greatest possibilities.

Pause... Think... Wonder...

Hold a seed in your hand. It may look lifeless. Yet hidden inside is a remarkable design waiting for the right conditions. A little soil. A little water. Warm sunlight. Fresh air. Given time, that tiny seed can become one of nature's greatest gifts.

Learning Objectives; By the end of this chapter you will be able to:

✓ Explain why plants are essential for life.

✓ Describe the parts of a plant and their functions.

✓ Understand photosynthesis in simple terms.

✓ Explain how plants reproduce and spread.

✓ Recognise the many ways plants support people and wildlife.

✓ Appreciate the importance of protecting plant life.

What Makes Plants So Special? Plants are the foundation of almost every ecosystem on Earth. Unlike animals, plants make their own food using sunlight, water and carbon dioxide. This remarkable process is called **photosynthesis**. As plants make food, they also release oxygen into the atmosphere. Without plants there would be very little food, there would be very little oxygen, many animals would lose their homes, the climate would become less stable, life as we know it could not exist. Plants are truly nature's silent builders.

The Amazing Parts of a Plant; Every part of a plant has an important job. **Roots;** Anchor the plant firmly in the soil. Absorb water and minerals. Store food in some plants. **Stem;** Supports the plant. Carries water and nutrients between roots and leaves. **Leaves;** Capture sunlight. Make food through photosynthesis. Release oxygen. **Flowers;** Help the plant reproduce. Attract bees, butterflies and other pollinators. **Fruits;** Protect the seeds. Provide food for animals and people. **Seeds;** Carry the next generation of plants. Spread through wind, water, animals or people. Every part works together like members of a team.

Photosynthesis – Nature's Greatest Kitchen

Imagine every green leaf as a tiny kitchen powered by sunlight. Inside each leaf sunlight provides energy, roots bring water, leaves absorb carbon dioxide, chlorophyll captures the Sun's energy, food is produced for the plant, oxygen is released into the air. This process feeds nearly every living creature, either directly or indirectly. Every meal we eat begins with a green plant.

Plants and People; Plants enrich our lives in countless ways. They provide food – grains, fruits, vegetables, spices. Medicines – many important medicines come from plants. Materials – timber, bamboo, cotton and paper. Clean air – by releasing oxygen and absorbing carbon dioxide. Climate regulation – by cooling the air and supporting rainfall.

Beauty – through flowers, gardens and forests. Plants care for us every day, often without us noticing.

Goa Spotlight; The Green Heritage of Goa Goa is blessed with a remarkable diversity of plant life. Its landscapes include coconut palms along the coast, cashew plantations, paddy fields, spice gardens, mangrove forests, medicinal plants, evergreen forests of the Western Ghats. These plants support wildlife, strengthen livelihoods and shape Goa's cultural traditions. Protecting this green heritage is essential for future generations.

Plant Partnerships; Plants rarely live alone. They work together with many other living creatures. Bees and butterflies pollinate flowers. Birds spread seeds. Fruit bats carry pollen and seeds over long distances. Earthworms improve the soil. Fungi help roots absorb water and nutrients. Nature is built on cooperation.

Meet an Eco Hero; Dr. Janaki Ammal (1897–1984)

Dr. Edavalath Kakkat Janaki Ammal was one of India's pioneering botanists and plant scientists. She made important contributions to the study of plants and helped improve agricultural crops through her research. Her lifelong dedication reminds us that careful study of plants can improve both people's lives and the protection of biodiversity. **Her Legacy;** Knowledge of plants helps us care more wisely for the living world.

Did You Know?

🌳 A mature tree can provide habitat for hundreds of different species of insects, birds and other animals.

🌱 Bamboo is one of the fastest-growing plants on Earth.

🌺 Many flowers open and close at different times of the day to attract their preferred pollinators.

🌿 Some forest trees communicate through underground fungal networks, sharing nutrients and warning neighbouring plants of certain stresses.

Hands-on Activity; Become a Plant Explorer

Choose one plant near your home or school. Observe it for seven days. Record height, leaf shape, flowers or fruits, insects visiting, birds nearby, changes after rain or sunshine. Draw your observations in a nature journal.

Family Challenge; Plant one native tree, fruit tree or medicinal plant together. Take turns watering and caring for it. Measure its height every month. Celebrate each new leaf as a reminder that patient care helps life flourish.

My Green Promise; I promise to respect every plant. Never damage trees unnecessarily. Plant and care for native species. Avoid wasting paper. Help make my school and neighbourhood greener.

Quiz Yourself

1. Why are plants called the foundation of most ecosystems?
2. What is photosynthesis?
3. Name the six main parts of a flowering plant.
4. What is the function of roots?
5. Why are flowers important?
6. Name three ways seeds can spread.
7. List five ways plants help people.
8. How do bees help plants?
9. Name three important plant communities found in Goa.
10. Why should we protect native plants?

The Gift Box; God's Gift to Us: Plants Plants ask for little. A handful of soil. A little water. Fresh air. Sunlight. In return they offer food, oxygen, medicine, shelter, beauty and hope. Every green leaf reminds us that generosity is woven into creation itself.

Pause... Look... Wonder...

Sit quietly beneath a tree. Place your hand gently on its trunk. Think of all that this tree has done today. It has captured sunlight. Lifted water from the soil. Released oxygen into the air. Provided shade. Sheltered birds and insects. Strengthened the ground with its roots. All without asking for anything in return. The green miracle is not only that plants live. The greater miracle is that they help everything else to live.

CHAPTER 8

FORESTS – THE GREAT COMMUNITIES OF LIFE

Where Every Living Thing Has a Place

"A forest is more than a place filled with trees. It is a living community where countless forms of life grow together in harmony."

The illustration opens like a window into a thriving forest in the Western Ghats of Goa. From the forest floor to the highest canopy, life is everywhere. High above towering evergreen trees, hornbills gliding between branches, monkeys swinging through the canopy. In the middle layer orchids blooming, butterflies fluttering, bees collecting nectar, birds building nests. Near the ground deer grazing, mushrooms growing on fallen logs, colourful insects, frogs beside a clear stream, earthworms beneath the leaf litter. Hidden underground roots intertwined, fungi connecting trees, water slowly filtering through the soil. Sunlight filters gently through the leaves, creating dancing patterns on the forest floor.

"In a forest, every life matters."

The Forest That Never Sleeps

During a school nature camp in the Western Ghats, a group of students gathered around their guide before sunrise. "Listen," he whispered. At first, they heard nothing. Then, slowly, the forest began to awaken. A distant bird called. Leaves rustled gently. A stream bubbled over smooth stones. Insects hummed softly. A monkey leapt across the branches. Sunlight slowly filtered through the trees. The guide smiled. "Many people think forests are quiet." "They are never quiet." "They are simply speaking a language we have not yet learned to hear." As the students walked deeper into the forest, they realised that every sound came from a living neighbour. Every tree, bird, insect, fungus and stream was part of one great community.

Pause... Think... Wonder...

Close your eyes for one minute. Imagine standing in the middle of a forest. What do you hear? Birdsong. Flowing water. Leaves dancing in the breeze. The call of insects. The rustle of small animals. A forest speaks through thousands of voices at once.

Learning Objectives; By the end of this chapter you will be able to:

✓ Explain what a forest is.

✓ Describe the different layers of a forest.

✓ Understand why forests are rich in biodiversity.

✓ Recognise the many benefits forests provide.

✓ Identify the threats facing forests.

✓ Suggest ways to protect and restore forests.

What Is a Forest? A forest is much more than a collection of trees. It is a living ecosystem where plants, animals, fungi, insects and microorganisms depend on one another. Forests provide food, shelter, water and protection for countless species. They also support people by providing clean air, fresh water, medicines, timber, fruits and many other resources. Healthy forests are among Earth's greatest treasures.

The Layers of a Forest; Every forest has different layers, each providing unique homes for living things. **Emergent Layer** The tallest trees rise above the rest, receiving the most sunlight. Large birds often rest or nest here. **Canopy** This leafy roof forms the heart of the forest. Many birds, monkeys, insects and reptiles spend most of their lives in this layer. **Understorey** Young trees, shrubs and shade-loving plants grow here. Butterflies, frogs and many birds thrive in this cooler environment. **Forest Floor** Fallen leaves, twigs and branches slowly decompose.

Earthworms, fungi, beetles and many tiny organisms recycle nutrients, creating rich soil that supports new life. Each layer depends on the others. Together they form one living community.

Nature's Teamwork; No living thing in a forest survives alone. Trees provide homes for birds. Birds spread seeds. Bees pollinate flowers. Earthworms improve the soil. Fungi recycle fallen leaves. Streams provide water. The Sun powers photosynthesis. Every species gives something and receives something. This cooperation keeps the forest healthy.

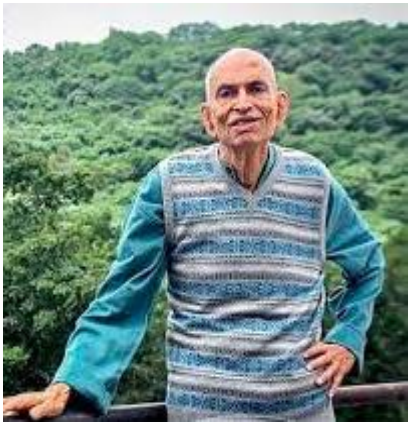
Forests and Climate; Forests help regulate Earth's climate by absorbing carbon dioxide, releasing oxygen, cooling the air through transpiration, protecting the soil, reducing floods, storing water, supporting rainfall. When forests are healthy, people and wildlife benefit alike.

Goa Spotlight; The Forests of the Western Ghats

The Western Ghats, which extend into eastern Goa, are among the world's most important biodiversity regions. These forests are home to majestic trees, colourful butterflies, hornbills, Malabar giant squirrels, frogs, snakes, orchids, medicinal plants, countless insects and microorganisms. They also protect Goa's rivers, recharge groundwater and influence the state's climate. By conserving these forests, we safeguard both wildlife and the well-being of our communities.

Forests and People; For generations, forests have supported human life. They provide clean air, fresh water, food, medicines, sustainable forest products, livelihoods, places for recreation, learning and reflection. Many indigenous and local communities also possess valuable traditional knowledge about living sustainably with forests. Protecting forests means respecting both nature and the people who depend on it.

Threats to Forests; Forests face many challenges. These include illegal logging, forest fires, pollution, invasive species, unsustainable development, habitat fragmentation, climate change. When forests are damaged, many plants and animals lose their homes, and the benefits forests provide to people are reduced.



Meet an Eco Hero; Dr. Madhav Gadgil Dr. Madhav Gadgil is one of India's leading ecologists and a strong advocate for conserving the Western Ghats. Through decades of research, he has shown how biodiversity, local communities and sustainable development are deeply connected. His work reminds us that protecting forests is not only about saving wildlife but also about ensuring a healthy future for people. **His Message** Healthy forests support healthy communities.

Did You Know?

🌳 A single mature tree can be home to hundreds of different species.

🍄 Many fungi form partnerships with tree roots, helping forests share nutrients and water.

🦜 Hornbills help forests regenerate by spreading seeds over long distances.

💧 Many rivers begin in forested hills, where trees help rainwater soak into the ground before it flows into streams.

Hands-on Activity; Become a Forest Observer

Visit a park, grove or forest with an adult or teacher. Spend fifteen minutes observing quietly. Can you find five different leaf shapes? three types of birds? signs of insects? fungi or mushrooms? animal tracks or nests? different tree bark textures? Record your observations in your nature journal.

Family Challenge; Choose one native tree in your neighbourhood. Visit it once every month. Notice how it changes through the seasons. Observe new leaves, flowers, fruits, birds, insects, shade, fallen leaves. You will discover that one tree is a small community in itself.

The Gift Box; God's Gift to Us: Forests

Forests ask for our care, not our applause. They quietly give us clean air, fresh water, rich soil, food, medicines, beauty and homes for wildlife. Their generosity reminds us that the strongest communities are those where every member contributes to the good of all.

Quiz Yourself

1. What makes a forest different from a group of trees?
2. Name the four main layers of a forest.
3. Why are forests important for biodiversity?
4. How do forests help regulate climate?
5. Give four benefits forests provide to people.
6. How do birds help forests?
7. What role do fungi play in a forest?

8. Name three threats to forests.
9. Why are the Western Ghats important to Goa?
10. What can you do to help protect forests?

Pause... Look... Wonder...

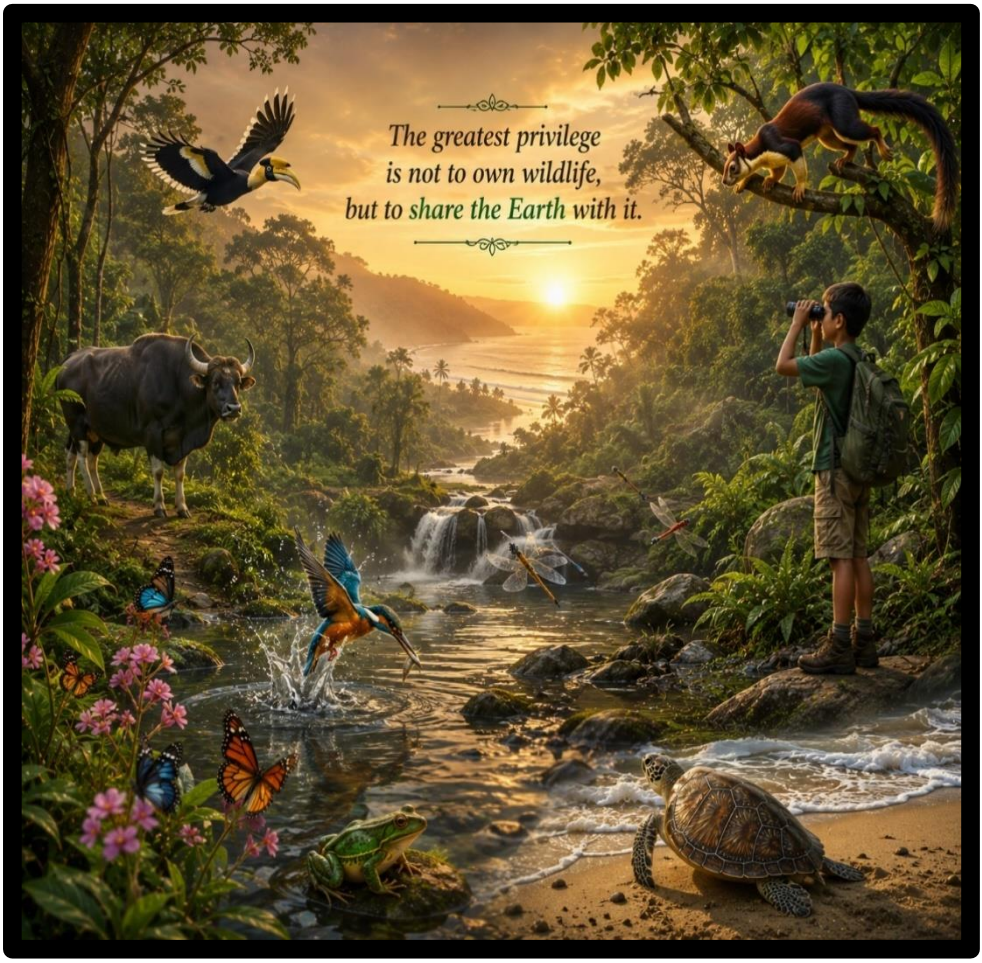
The next time you enter a forest, slow your steps. Look up at the canopy. Listen to the birds. Feel the cool air. Touch the bark of an old tree with gentle respect. Remember that you are standing in a community that has been growing, sharing and renewing itself for generations. Every leaf, every root, every bird and every stream has a story. Together they remind us that life is strongest when it grows in relationship—with one another and with the Earth that sustains us.

CHAPTER 9

WILDLIFE – OUR FELLOW TRAVELLERS ON EARTH

Every Creature Has a Place in Nature's Story

"The Earth is not ours alone. We share it with millions of living creatures, each with its own story and purpose."



A sunrise scene unfolds in the forests and rivers of Goa. An Indian gaur walks quietly through the forest. A Malabar giant squirrel leaps between branches. A hornbill flies above the canopy. A kingfisher dives into a stream. Butterflies gather around wildflowers. A frog sits beside a forest pool. Dragonflies skim over the water. A sea turtle makes its way toward the Arabian Sea. A child stands silently with binoculars, watching rather than disturbing.

"The greatest privilege is not to own wildlife, but to share the Earth with it."

The Injured Kingfisher

One rainy afternoon, Riya noticed a kingfisher sitting quietly near a stream. Usually, it would dart across the water in a flash of brilliant blue. Today, it hardly moved. She called her grandfather, who quietly observed the bird from a distance. "It may be injured," he said. "What should we do?" Riya asked. "We should care," he replied, "but we should also be careful." Together they contacted the local forest authorities, who arranged for trained rescuers to help the bird. A few weeks later, the kingfisher was released back into the wild. Watching it fly away, Riya smiled. Grandfather gently said, "Sometimes loving wildlife means helping it remain wild." That day, Riya learned that respect is one of the greatest forms of care.

Pause... Think... Wonder...

Imagine waking up tomorrow morning... ...and hearing no birds. No butterflies visiting flowers. No frogs calling after the rain. No bees buzzing. How different would our world feel? Wildlife fills our planet with movement, colour, music and life.

Learning Objectives; By the end of this chapter you will be able to:

✓ Explain what wildlife is.

✓ Understand the importance of biodiversity.

✓ Recognise the roles different animals play in ecosystems.

✓ Appreciate the rich wildlife of Goa.

✓ Identify the major threats to wildlife.

✓ Suggest ways to protect wild animals and their habitats.

What Is Wildlife? Wildlife includes all animals living freely in nature. They may be mammals, birds, reptiles, amphibians, fish, insects, spiders and many other fascinating creatures. Wildlife exists in forests, rivers, wetlands, grasslands, mountains, villages, cities and oceans. Every habitat supports different forms of life. Every species has its own place in nature.

Why Does Wildlife Matter? Each animal contributes in its own way. Bees pollinate crops and wildflowers. Butterflies help pollinate many flowering plants and also indicate healthy environments. Birds spread seeds and help control insects. Snakes help regulate populations of rodents and other small animals. Frogs feed on insects and are sensitive indicators of environmental health. Bats pollinate flowers, disperse seeds and consume large numbers of insects. Even the smallest creatures help maintain nature's balance.

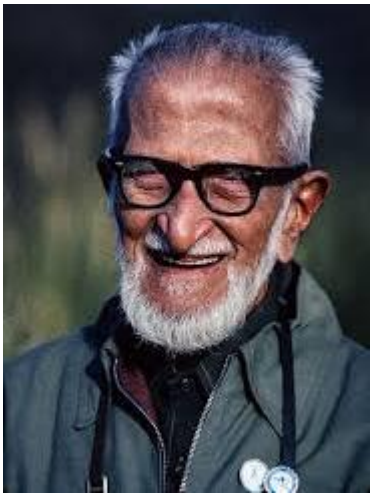
Amazing Adaptations; Animals survive because they are adapted to their habitats. Examples include a gecko's feet help it climb smooth walls. Owls have excellent night vision and hearing. Deer use keen senses to detect danger. Ducks have waterproof feathers. Sea turtles return to sandy beaches to lay their eggs. Every adaptation tells a story of survival over many generations.

Goa Spotlight; Goa's Wildlife Heritage Goa's forests, rivers, wetlands and coastline support an extraordinary variety of wildlife. Some remarkable species include Indian gaur, Malabar giant squirrel, Indian pangolin, smooth-coated otter, hornbills, kingfishers, sea turtles, flying foxes, butterflies, dragonflies, frogs and many more. Protected areas such as **Bhagwan Mahavir Wildlife Sanctuary**, **Mollem National Park**, **Bondla Wildlife Sanctuary**, **Cotigao Wildlife Sanctuary**, **Mhadei Wildlife Sanctuary** and **Salim Ali Bird Sanctuary** help conserve these habitats for future generations.

Wildlife and People; People and wildlife have shared the landscape for thousands of years. Healthy wildlife populations benefit us by supporting agriculture through pollination, spreading seeds that

regenerate forests, helping control pests, maintaining healthy ecosystems, inspiring scientific discoveries, enriching art, culture and storytelling. Protecting wildlife also protects the natural systems that sustain our own lives.

Living Respectfully with Wildlife; Most wild animals avoid people. We can help them by observing from a distance, never feeding wild animals, avoiding litter, driving carefully near wildlife crossings, protecting forests, rivers and wetlands, reporting injured wildlife to the appropriate authorities rather than trying to keep it as a pet. Respect keeps both people and wildlife safe.



Meet an Eco Hero; Dr. Sálim Ali (1896–1987) Known as the "Birdman of India," Dr. Sálim Ali inspired generations of people to observe birds carefully and appreciate their role in nature. His research transformed the study of birds in India and strengthened efforts to conserve important habitats. His work reminds us that careful observation is the first step towards protecting wildlife. **His Message** "When we understand nature, we are more likely to protect it."

Did You Know?

🦋 Butterflies taste with their feet.

🦇 Many bats are important pollinators and seed dispersers, especially at night.

🐘 Elephants can communicate using very low-frequency sounds that travel long distances.

🦉 Some owls can turn their heads remarkably far, helping them look around without moving their bodies.

Flame throated bulbul is state bird of Goa

Malabar tree nymph is the state butterfly of Goa.

Hands-on Activity; Become a Wildlife Watcher

Spend twenty minutes quietly observing nature near your home, school or a local park. Record birds seen, butterflies observed, insects noticed, animal sounds heard, signs of wildlife such as feathers, nests or footprints. Remember observe do not disturb.

Family Challenge; Choose one local bird or butterfly. Together, learn its name, where it lives, what it eats, how it helps nature, what threats it faces. Share your discovery with another family or your classmates.

The Gift Box; God's Gift to Us: Wildlife Every creature has a place. Some fly. Some crawl. Some swim. Some run. Some sing before sunrise. Others awaken after sunset. Together they make our world richer, healthier and more beautiful. To care for wildlife is to honour the diversity of life itself.

Quiz Yourself

1. What is wildlife?
2. Name four different groups of wild animals.
3. How do bees help people and plants?
4. Why are frogs considered indicators of environmental health?
5. Give three examples of animal adaptations.
6. Name four protected areas in Goa.
7. Why should we never feed wild animals?
8. How do birds help forests?
9. What are two threats to wildlife?
10. What can you do to help protect wildlife?

Pause... Look... Wonder...

The next time you see a butterfly resting on a flower... ...or hear a bird singing outside your window... ...or watch a crab scurry across the beach... pause for a moment. Remember that you are not looking at something separate from your life. You are meeting a fellow traveller on the same planet. Every creature has its own journey. Every creature has its own purpose. And together, we share one extraordinary home.

CHAPTER 10

BIODIVERSITY – NATURE'S MAGNIFICENT TAPESTRY

The Beauty of Life in All Its Diversity

"Nature is strongest when life flourishes in many different forms."

A panoramic scene stretches from the peaks of the Western Ghats to the Arabian Sea. Within one breathtaking landscape we see evergreen forests, rivers, waterfalls, paddy fields, mangroves, sandy beaches, rocky shores, coral communities beneath the sea, butterflies, bees, hornbills, kingfishers, frogs, deer, monkeys, fish, sea turtles, crabs, wildflowers, towering trees, tiny mushrooms, children exploring with notebooks and binoculars. The illustration is linked with delicate threads of light showing that every living thing is connected.

"The beauty of nature lies not in one form of life, but in the harmony of many."

The Woven Shawl

Grandmother sat quietly weaving a colourful shawl. Her granddaughter Anya watched with curiosity. "So many different colours," Anya said. "Wouldn't it be easier to use only one?" Grandmother smiled. She held up a single thread. "Can this one thread become a shawl?" "No," Anya replied. She then held up dozens of threads woven together. "What about these?" "Now it is beautiful," Anya smiled. Grandmother nodded. "A forest is woven like this." "A river is woven like this." "Our Earth is woven like this." "Every bird, butterfly, frog, tree, flower and fungus is one thread." "If too many threads are removed..." "...the whole tapestry becomes weaker." Anya looked at the finished shawl with new eyes. Nature, she realised, was the greatest tapestry ever woven.

Pause... Think... Wonder...

Imagine a garden with only one kind of flower. Now imagine a garden with roses, lilies, sunflowers, orchids, jasmine and wildflowers buzzing with bees and butterflies. Which garden would attract more life? Which would bring more colour, fragrance and joy? Nature celebrates diversity because diversity brings strength.

Learning Objectives; By the end of this chapter you will be able to:

✓ Explain what biodiversity means.

✓ Describe the three main levels of biodiversity.

✓ Understand why biodiversity is important.

✓ Recognise Goa's rich biodiversity.

✓ Identify threats to biodiversity.

✓ Suggest practical ways to conserve biodiversity.

What Is Biodiversity? The word **biodiversity** means the incredible variety of life on Earth. It includes all plants, all animals, fungi, microorganisms and the ecosystems in which they live. Scientists often describe biodiversity at three levels: **Genetic Diversity** The differences within the same species. For example, different varieties of rice, mangoes or coconuts have unique characteristics that help them survive different conditions. **Species Diversity** The variety of living organisms. From butterflies and frogs to giant trees and microscopic fungi, each species has its own role in nature. **Ecosystem Diversity** The variety of habitats such as forests, rivers, wetlands, grasslands, mangroves and coral reefs. Each ecosystem supports its own unique community of life. Together, these three levels make our planet resilient and vibrant.

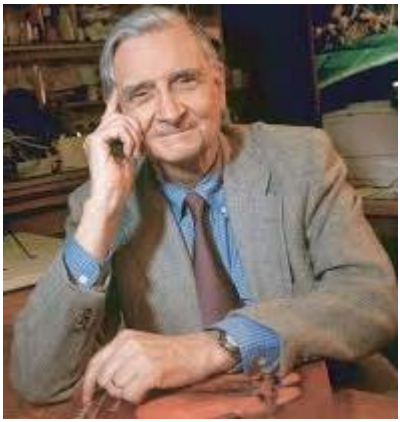
Why Biodiversity Matters; Every species contributes to the health of our planet. Biodiversity provides food security through diverse crops. Medicines from plants, fungi and other organisms. Pollination by bees, butterflies, birds and bats. Healthy forests that regulate climate. Clean water through healthy ecosystems. Greater resilience to environmental change. A world rich in biodiversity is a world better able to adapt, recover and thrive.

Nature's Web of Relationships; No living organism exists alone. Flowers depend on pollinators. Pollinators depend on flowers. Birds spread seeds. Trees provide food and shelter. Fungi recycle nutrients. Earthworms enrich the soil. Streams nourish forests. Forests protect rivers. Every connection strengthens the whole. When one part is damaged, many others are affected. This is why biodiversity is often described as the web of life.

Goa Spotlight - A Treasure of Biodiversity; Though small in size, Goa is rich in biodiversity. Its varied landscapes include evergreen forests, moist deciduous forests, rivers, estuaries, mangroves, wetlands,

grasslands, beaches, coastal waters. These habitats support thousands of species, including many found only in the Western Ghats. Protecting Goa's biodiversity means protecting the natural heritage that supports our water, climate, agriculture, fisheries and tourism.

Biodiversity Under Threat; Biodiversity faces many challenges. These include habitat loss, pollution, invasive species, climate change, overexploitation of natural resources, illegal wildlife trade. When species disappear, ecosystems become less stable and less able to support life. Conservation helps ensure that future generations inherit a living planet rich in diversity.



Meet an Eco Hero; Dr. E. O. Wilson (1929–2021)

Known as the "Father of Biodiversity," Dr. Edward O. Wilson helped the world appreciate the importance of protecting Earth's astonishing variety of life. He believed that every species, no matter how small, contributes to the health of our planet. His work inspired people across the world to value and conserve biodiversity. **His Message** "The little things that run the world are often the ones we overlook."

Meet a Goan Neighbour; The Southern Birdwing Butterfly

Scientific Name: *Troides minos*

Where it lives: Forests and wooded areas of the Western Ghats.

Favourite food: As a caterpillar, it feeds on specific host plants; as an adult, it drinks nectar from flowers.

Why it matters: It helps pollinate flowering plants and is an indicator of healthy forest habitats.

Amazing Fact: It is India's largest butterfly, with a wingspan that can exceed 15 centimetres.

How can we help?

- Protect native forests.
- Grow nectar-rich flowering plants.
- Avoid unnecessary pesticide use.
- Never collect butterflies from the wild.

Did You Know?

🧬 Scientists estimate that millions of species may still be undiscovered.

🍄 A single handful of healthy forest soil contains an extraordinary diversity of microscopic life.

🐝 Many of the fruits and vegetables we enjoy depend on animal pollinators.

🌊 Mangroves support fish, crabs and birds while also protecting coastlines from erosion and storms.

Hands-on Activity; Become a Biodiversity Explorer

Visit your school garden, neighbourhood park or a nearby natural area. Create a biodiversity checklist. Can you find: five different trees? five kinds of insects? three bird species? flowering plants? fungi? signs of animal life? Discuss why every species you observed contributes to the ecosystem.

Family Challenge; Create a **Biodiversity Corner** at home. Plant a mixture of flowering plants, herbs, native tree if space allows, nectar plants for butterflies. Observe over several weeks. Which insects, birds and butterflies visit? Record your discoveries together.

The Gift Box; God's Gift to Us: Biodiversity Creation is not monotonous. It is wonderfully varied. Different colours. Different songs. Different shapes. Different habitats. Different gifts. The richness of life reminds us that diversity is not something to fear. It is something to celebrate, protect and cherish.

Quiz Yourself

1. What is biodiversity?

2. Name the three levels of biodiversity.
3. Why is biodiversity important for food security?
4. How do pollinators contribute to biodiversity?
5. Give four examples of ecosystems found in Goa.
6. What are two threats to biodiversity?
7. Why are mangroves important?
8. What role do fungi play in ecosystems?
9. How can families encourage biodiversity at home?
10. Why is every species valuable?

Pause... Look... Wonder...

Look at a patch of grass. At first glance, it may seem ordinary. Now look more closely. You may notice tiny flowers, busy ants, butterflies, beetles, spiders, worms, birds searching for food and seeds waiting to grow. What first appeared simple is actually full of life. Nature rewards those who take time to observe. The more carefully we look, the more we discover that every living thing is part of one magnificent tapestry.

CHAPTER 11

ECOSYSTEMS – NATURE'S PERFECT BALANCE

Where Every Living Thing Is Connected

"An ecosystem is nature's way of showing that life flourishes through relationships."

A panoramic view of Goa stretches from the mist-covered Western Ghats to the Arabian Sea. Golden arrows gently connect: Sunlight → Trees → Oxygen → Children. Rain → Rivers → Farms → Food. Fallen leaves → Earthworms → Rich soil → Healthy plants. Flowers → Bees → Fruits → Birds. Rivers → Estuaries → Mangroves → Sea. Nothing stands alone. Every part is connected.

"Nature is not built upon isolation. It is built upon relationships."

The Broken Wheel

A village carpenter showed his grandson an old wooden cart. One wheel had lost a single spoke. "It is only one piece," the boy said. The carpenter smiled and invited him to pull the cart. The wheel wobbled badly. Soon another spoke bent. Then another. Before long, the wheel could no longer carry the cart. The carpenter gently said, "Sometimes people think one missing part does not matter." "But every part supports another." He pointed towards the nearby forest. "The same is true there." "If one species disappears..." "...many others are affected." "The strength of the forest is found not in one tree but in all its relationships." The boy looked towards the forest with new understanding. Nature was like a beautifully crafted wheel. Every part mattered.

Pause... Think... Wonder...

Think about your own family. Each person has different gifts. Someone cooks. Someone teaches. Someone earns a living. Someone encourages others. Together your family becomes stronger. Nature works in much the same way. Every living thing has its own role.

Learning Objectives; By the end of this chapter you will be able to:

✓ Explain what an ecosystem is.

✓ Identify the living and non-living parts of an ecosystem.

✓ Understand how energy flows through ecosystems.

✓ Describe simple food chains and food webs.

✓ Recognise the importance of ecological balance.

✓ Suggest ways to protect ecosystems.

What Is an Ecosystem? An ecosystem is a community of living organisms interacting with one another and with their physical environment. The living (biotic) parts include plants, animals, fungi, bacteria, insects, people. The non-living (abiotic) parts include sunlight, air, water, soil, rocks, temperature. Life depends on the interaction

between both. An ecosystem is not simply a location—it is a network of relationships.

Nature's Team; Every member of an ecosystem has a role. **Producers;** Green plants make food using sunlight. They form the foundation of nearly every ecosystem. **Consumers;** Animals obtain energy by eating plants or other animals. Different animals occupy different places in the food chain. **Decomposers;** Fungi, bacteria and earthworms break down dead plants and animals. They return nutrients to the soil, allowing new life to grow. Without decomposers, ecosystems would soon be overwhelmed by waste.

The Journey of Energy; Everything begins with the Sun. Sunlight provides energy for plants. Plants feed herbivores. Herbivores feed carnivores. When organisms die, decomposers recycle nutrients back into the soil. The cycle begins again. Nothing in nature is wasted.

Food Chains and Food Webs; A food chain shows one pathway through which energy moves. Example: Sun → Grass → Grasshopper → Frog → Snake → Eagle. In reality, nature is much more connected. Most organisms eat and are eaten by several different species. These interconnected feeding relationships form a **food web**. Food webs make ecosystems more stable because many species are linked together.

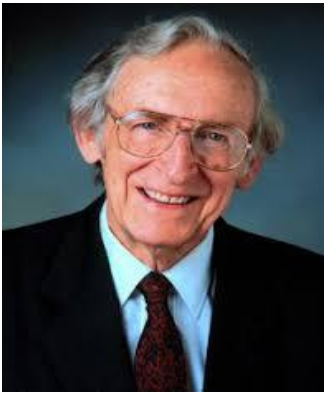
Ecosystems Around Us; Ecosystems exist everywhere. Some examples include: Forest ecosystems, Grassland ecosystems, Freshwater ecosystems, Marine ecosystems, Mangrove ecosystems, Wetlands, Urban ecosystems. Even a small garden or school pond is an ecosystem filled with interacting forms of life.

Goa Spotlight – A Mosaic of Ecosystems; Goa's remarkable natural heritage includes many different ecosystems. Among them are evergreen forests, rivers, waterfalls, mangroves, estuaries, beaches, sand dunes, paddy fields, laterite plateaus, coastal waters. Each supports unique plants, animals and ecological processes. Together they create one of India's richest natural landscapes. Protecting one ecosystem often helps protect many others connected to it.

Ecological Balance; Healthy ecosystems remain balanced because different species perform different roles. Predators help regulate prey

populations. Pollinators help plants reproduce. Decomposers recycle nutrients. Trees protect the soil. Wetlands filter water. Every role matters. When one important part is removed, the balance may be disturbed. This is why conserving biodiversity is essential for healthy ecosystems.

Ecosystems Under Pressure; Many ecosystems face increasing challenges. These include habitat destruction, pollution, invasive species, climate change, overuse of natural resources, fragmentation. Fortunately, ecosystems can recover when given time, protection and wise management. Nature has remarkable resilience.



Meet an Eco Hero; Dr. Eugene P. Odum (1913–2002)

Dr. Eugene Odum is often called the **Father of Modern Ecology**. He helped scientists understand ecosystems as interconnected living systems rather than isolated plants and animals. His work transformed ecology into the study of relationships, energy flow and the balance of nature. **His Message** To understand nature, we must understand relationships.

Meet a Goan Neighbour; The Mangrove Tree

Where it lives: Along Goa's estuaries and tidal creeks.

Why it is important:

- protects the coastline,
- prevents erosion,
- filters water,
- provides nurseries for fish and crabs,
- supports many birds.

Amazing Fact; Mangroves can survive in salty water by using remarkable adaptations that allow them to manage salt and breathe through specialised roots.

How can we help?

- Never dump waste into estuaries.
- Protect mangrove habitats.
- Participate in coastal clean-up programmes.
- Learn about the wildlife that depends on mangroves.

Did You Know?

🌍 Even a fallen tree continues to support life by becoming food and shelter for fungi, insects and many other organisms.

🦅 Birds of prey help maintain ecological balance by controlling populations of small animals.

🌱 Decomposers quietly recycle nutrients that keep ecosystems productive.

🌿 A healthy ecosystem is usually more resilient to storms, droughts and other environmental changes.

Hands-on Activity; Build Your Own Mini Ecosystem

Fill a clear glass jar or bottle with small stones, a little soil, moss or a tiny plant, a few drops of water. Seal it lightly or cover it as instructed by your teacher. Observe it for several weeks. Notice how water condenses, plants grow and tiny changes occur. Discuss how living and non-living parts interact inside your miniature ecosystem.

Family Challenge; Visit a nearby natural area—a beach, riverbank, park or forest. Together make two lists. **Living things you observed. Non-living things that support them.** Then ask: "What would happen if one important part disappeared?" Discuss how everything depends on everything else.

The Gift Box; God's Gift to Us: Ecosystems Nature teaches us that life is strongest when relationships are healthy. Every species gives. Every species receives. Every ecosystem reminds us that cooperation is not weakness—it is the wisdom of creation. When we protect ecosystems, we protect the intricate relationships that make life possible.

Quiz Yourself

1. What is an ecosystem?
2. What is the difference between biotic and abiotic components?
3. Name the three main groups of organisms in an ecosystem.
4. Why are decomposers important?
5. What is the difference between a food chain and a food web?
6. Name five ecosystems found in Goa.
7. How do mangroves protect coastal areas?
8. What are three threats to ecosystems?
9. How can ecosystems recover?
10. Why is ecological balance important?

Pause... Look... Wonder...

The next time you stand beside a river... ...walk through a forest... ...sit under a tree... ...or watch waves reach the shore... remember that you are not looking at separate pieces of nature. You are witnessing an ecosystem at work. Countless relationships, patiently woven together over thousands of years. Every drop of water. Every grain of soil. Every leaf. Every insect. Every bird. Every breath. Together they reveal one extraordinary truth: **Life flourishes when creation lives in harmony.**

CHAPTER 12

HUMAN BEINGS – STEWARDS OF OUR COMMON HOME

Caring for the Earth with Wisdom, Gratitude and Responsibility

"The Earth is not a gift from us to the next generation. It is a gift entrusted to us, to be cared for with love and passed on with gratitude."

The Borrowed Garden

A wise grandmother owned a beautiful garden filled with fruit trees, flowers and birds. Before leaving on a long journey, she gave the key to her granddaughter, Asha. "This garden is now in your care," she said. "You may enjoy its fruits and flowers. You may invite others to enjoy it too. But remember..." "...it does not belong to you." "When I return, I hope to find it even more beautiful than when I left." Months passed. Asha watered the plants. She removed weeds. She planted new flowers. She protected young trees. She shared fruit with her neighbours. When her grandmother returned, the garden was flourishing. She smiled warmly. "You understood something important." "You were not its owner." "You were its steward." In many ways, our Earth is like that garden. It is a gift entrusted to us. Our responsibility is not only to enjoy it but also to care for it so that those who come after us may receive it with joy.

Pause... Think... Wonder...

Imagine that someone gives you a beautiful book from their family library. Would you tear its pages? Would you write on every page? Would you throw it away? Or would you treasure it and return it in even better condition? Our common home deserves the same care.

Learning Objectives; By the end of this chapter you will be able to:

✓ Explain what stewardship means.

✓ Understand why caring for creation is everyone's responsibility.

✓ Recognise how everyday choices affect the environment.

✓ Discover practical ways to live sustainably.

✓ Inspire others to become stewards of nature.

What Does It Mean to Be a Steward? A steward is someone who cares responsibly for something that has been entrusted to them. A steward does not own everything. A steward protects, nurtures and uses resources wisely. In the same way, human beings are called to care for the Earth. We depend on clean air, fresh water, fertile soil, healthy forests and thriving wildlife. By caring for creation, we also care for ourselves and for future generations.

Our Place in Nature; Human beings are remarkable. We can think, learn, invent and make choices. These abilities bring great opportunities—but also great responsibilities. Unlike other living creatures, we can decide whether to conserve or waste, restore or pollute, plant or destroy, cooperate or ignore. Every choice shapes the future of our common home.

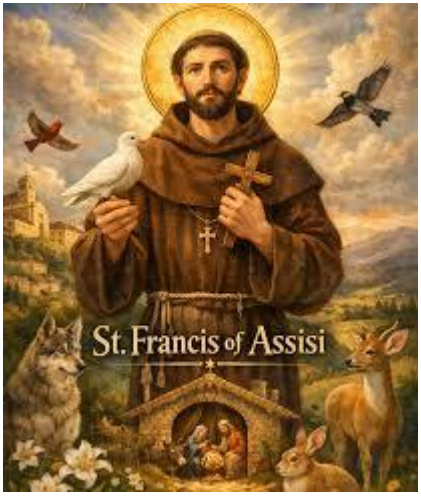
Small Choices, Big Impact; Many environmental problems begin with small actions repeated many times. The good news is that positive habits work the same way. Every day we can choose to save water. Plant and care for trees. Walk or cycle when possible. Use reusable bags and bottles. Reduce, reuse and recycle. Respect wildlife. Switch off lights and fans when not needed. Keep our surroundings clean. Thousands of small actions together create lasting change.

Caring for Our Community; Looking after the environment also means caring for people. Healthy neighbourhoods have clean streets, safe drinking water, green spaces, clean rivers, healthy food, respect for one another. Environmental stewardship and community well-being go hand in hand.

Goa Spotlight; Young Stewards Across Goa Across Goa, many students, schools, parishes, youth groups and local communities

are already caring for the environment. They participate in tree planting, beach clean-ups, river restoration, biodiversity surveys, kitchen gardens, composting, rainwater harvesting, wildlife awareness, waste segregation. These efforts show that age is never a barrier to making a difference. Every student can become a steward of Goa's natural heritage.

Stewardship at Home and School; At Home Save water and electricity. Segregate waste. Compost kitchen scraps. Grow herbs or flowering plants. Avoid single-use plastics. **At School** Keep classrooms clean. Care for school gardens. Save paper. Start an Eco Club. Encourage recycling. Stewardship grows wherever people work together.



Meet an Eco Hero; St. Francis of Assisi (1181/1182–1226)

St. Francis looked at creation with wonder and gratitude. He spoke of the Sun, Moon, water, fire and all living creatures as part of one great family of creation. His life reminds us that caring for nature begins with humility, gratitude and love. He inspires people around the world to see the Earth not as something to exploit, but as a gift to cherish. **His Message** "Take care of creation, and creation will continue to care for you."

Did You Know?

🌍 Every person leaves an environmental footprint through the choices they make.

🌳 A single tree planted today may provide shade, clean air and habitat for decades.

💧 Fixing a leaking tap can save thousands of litres of water over a year.

🌿 Young people around the world are leading inspiring environmental projects in their schools and communities.

Hands-on Activity; My Stewardship Plan Choose three actions you will practise this month. Save water every day. Carry a reusable water bottle. Plant and care for one native plant. Walk or cycle short distances. Teach one younger child about caring for nature. Write about your experience at the end of the month. What changed? How did your actions help others?

Family Challenge; Hold a **Family Stewardship Meeting**. Together discuss: What do we already do well? Where do we waste resources? What one new habit can we begin this week? How can every family member contribute? Create a simple family pledge and display it where everyone can see it.

The Gift Box; God's Gift to Us: Responsibility

Every gift carries a responsibility. The gift of water calls us to protect rivers. The gift of forests calls us to plant trees. The gift of wildlife calls us to respect life. The gift of understanding calls us to act with wisdom. Stewardship is love made visible through everyday choices.

Quiz Yourself

1. What is a steward?
2. Why are human beings called to be stewards of the Earth?
3. Name five everyday actions that protect the environment.
4. How does caring for nature also help people?
5. What environmental activities are taking place in Goa?
6. What can schools do to become more environmentally friendly?
7. Why are small actions important?
8. What is an environmental footprint?
9. How can your family become better stewards?
10. What stewardship action will you begin today?

My Steward's Promise; I promise to care for the Earth with gratitude. I will protect water. I will plant and care for trees. I will respect wildlife. I will reduce waste. I will encourage others through my

example. I will remember that our common home is a gift entrusted to all of us.

Pause... Look... Wonder...

Stand outside your home at sunrise or sunset. Look at the trees. Listen to the birds. Feel the breeze. Think about everything you have learned in this handbook. The Earth has been quietly caring for you every day of your life. Perhaps the greatest way to say "thank you" is not simply with words, but with the way you choose to live.

CHAPTER 13

CLIMATE CHANGE – UNDERSTANDING A CHANGING WORLD

Learning About One of the Greatest Challenges of Our Time

"Climate has always changed over Earth's history, but today human activities are contributing to changes that are happening much more rapidly. Understanding these changes helps us respond with wisdom, responsibility and hope."

Grandfather's Monsoon Diary

Every year, Grandfather carefully wrote the date of the first monsoon rain in his old diary. One evening, his grandson Aarav looked through its pages. "For many years," Grandfather explained, "the rains usually arrived around the same time." "But look at these recent entries." Some years the rains came much later. Some years they arrived suddenly with very heavy downpours. Some years there were long dry spells even during the rainy season. Aarav looked puzzled. "Is the weather changing?" Grandfather smiled gently. "The weather changes every day." "But when the usual pattern changes over many years..." "...we begin to talk about changes in climate." Aarav closed the diary. He realised that understanding climate meant paying attention not only to today, but also to many tomorrows.

Pause... Think... Wonder...

Think about your own experiences. Have you noticed: hotter summer afternoons? heavier rain in a short time? stronger waves during storms? streams that dry earlier than before? Share your observations with your family or classmates. Careful observation is the first step in understanding our changing world.

Learning Objectives; By the end of this chapter you will be able to:

✓ Explain the difference between weather and climate.

✓ Understand what climate change means.

✓ Recognise some human activities that contribute to climate change.

✓ Identify possible impacts on people and nature.

✓ Discover practical ways to reduce our impact and adapt wisely.

Weather and Climate; Weather describes the conditions we experience over a short period. It changes from hour to hour or day to day. Examples include today's temperature, today's rainfall, today's wind. Climate describes the average pattern of weather over many years. It helps us understand what conditions are generally expected in a particular region. Weather tells us what is happening today. Climate helps us understand long-term patterns.

What Is Climate Change?

Climate change refers to significant long-term changes in Earth's climate. Scientists have found that human activities—especially the burning of coal, oil and natural gas, large-scale deforestation and some industrial processes—have increased the amount of heat-trapping gases in the atmosphere. These gases strengthen the natural greenhouse effect, causing the Earth's average temperature to rise. As the climate changes, rainfall patterns, temperatures and some weather extremes may also change. Understanding these processes helps communities prepare and respond.

How Does Climate Change Affect Us? Climate change can influence many parts of life. Possible impacts include hotter days and more frequent heatwaves, heavier rainfall in some places, water shortages during dry periods, rising sea levels affecting coastal areas, challenges for agriculture, changes in habitats for wildlife, increased health risks during extreme weather. Different places experience these changes in different ways. Communities can reduce risks by planning wisely and caring for natural ecosystems.

Nature Helps Us Respond; Healthy ecosystems are among our greatest allies. Forests absorb carbon dioxide and cool the environment. Mangroves protect coastlines from storms and erosion. Wetlands reduce flooding and store water. Healthy soils retain moisture during dry periods. Protecting nature is one of the most effective ways to build resilience.

Goa Spotlight; Climate Change and Goa Goa's location along the Arabian Sea makes it especially important to understand changing climate conditions. Communities may notice warmer summers, changing monsoon patterns, coastal erosion in some areas, pressures on fisheries, impacts on agriculture, increased importance of protecting rivers, forests and mangroves. Local knowledge, scientific research and community action all play important roles in preparing for the future.

Hope in Action; Around the world, people are responding with creativity and determination. They are planting trees, restoring forests, protecting wetlands, improving public transport, using renewable energy, designing energy-efficient buildings, reducing waste, conserving water, developing climate-smart farming methods. Every positive action contributes to a healthier future.

Meet an Eco Hero; Dr. Sunita Narain

Dr. Sunita Narain is one of India's leading environmental thinkers and advocates for sustainable development. She has encouraged practical solutions that combine environmental protection with fairness for communities. Her work reminds us that climate action should improve both the health of the planet and the well-being of people. **Her Message** The best environmental solutions are those that protect both people and nature.

Meet a Goan Neighbour; The Mangrove Forest Mangrove ecosystems are among nature's strongest climate partners.

Why they matter:

- store large amounts of carbon,
- reduce coastal erosion,
- protect communities during storms,
- provide nurseries for fish and crabs,
- support birds and other wildlife.

Protecting mangroves is one practical way to strengthen both biodiversity and climate resilience in Goa.

Did You Know?

🌎 The Earth has experienced natural climate changes throughout its history, but today's rapid warming is strongly linked to increased greenhouse gas concentrations from human activities.

🌳 Trees help remove carbon dioxide from the atmosphere while providing shade and cooling.

🚲 Walking or cycling short distances can reduce air pollution and greenhouse gas emissions while improving health.

🌞 Solar and wind energy generate electricity without burning fossil fuels during operation.

Hands-on Activity; Become a Climate Observer Keep a **Climate Journal** for one month. Record daily temperature (warm, hot or cool), rainfall, cloud cover, bird or butterfly activity, any unusual weather events. Compare your observations with those of classmates. Discuss how careful records help scientists and communities understand long-term changes.

Family Challenge; Carry out a **Home Climate Check**. Together identify three ways your family can reduce its environmental impact. Examples include switching off unused lights, using reusable bags, reducing food waste, planting native trees, saving water, walking short distances when practical. Choose one new habit to continue throughout the year.

The Gift Box; God's Gift to Us: Hope Climate change is a serious challenge. But history shows that people can solve difficult

problems when they work together with wisdom, science and compassion. Hope is not waiting for others to act. Hope begins when each of us chooses to become part of the solution.

Quiz Yourself

1. What is the difference between weather and climate?
2. What is climate change?
3. Name three human activities that contribute to climate change.
4. Give four possible impacts of climate change.
5. How do forests help reduce climate change?
6. Why are mangroves important for Goa?
7. What can families do to reduce their environmental impact?
8. Why is careful observation important for understanding climate?
9. How can communities adapt to changing climate conditions?
10. Why is hope an important part of climate action?

The Steward's Challenge; This week, become a **Climate Champion**. Choose one action that reduces greenhouse gas emissions or strengthens your community's resilience. Perhaps you will plant a native tree, walk or cycle instead of using a vehicle for a short trip, switch off unused electrical appliances, help care for a mangrove or riverbank, encourage your family to save energy. At the end of the week, write one paragraph answering: **"How did my actions help care for our common home?"**

Pause... Look... Wonder...

The next time rain falls... ...or you feel the warmth of the Sun... ...or stand beside the sea... remember that climate is more than a scientific idea. It is the rhythm of life that connects clouds, forests, rivers, oceans, wildlife and people. By understanding those rhythms, we become wiser caretakers of the Earth. The future is not written by fear. It is written by the choices we make today.

CHAPTER 14

WATER CONSERVATION – EVERY DROP MATTERS

Protecting the Gift That Sustains All Life

"Water is life's most precious shared resource. Every drop we save today helps sustain people, wildlife and the Earth tomorrow."

The Last Cup of Water

One hot afternoon, a teacher placed a single cup of clean water on a table. The students looked at it curiously. "What do you see?" she asked. "A cup of water," one student replied. The teacher smiled. "Look again." She invited the class to imagine the journey of that water. Perhaps it had fallen as rain on the Western Ghats. It had flowed through forests. It had seeped into the soil. It had travelled through streams and rivers. It had been carefully cleaned before reaching their homes. "So," she asked gently, "is it just a cup of water?" The classroom became silent. One child quietly answered, "It is the journey of nature." The teacher nodded. "And because it has travelled so far to reach us, every drop deserves our respect."

Pause... Think... Wonder...

Before you drink your next glass of water, pause for a moment. Ask yourself: Where did this water come from? How many people helped bring it to me? How many living things depended on it before I did? Gratitude is the first step towards conservation.

Learning Objectives; By the end of this chapter you will be able to:

✓ Explain why fresh water is precious.

✓ Describe where our water comes from.

✓ Recognise threats to water resources.

✓ Understand the importance of water conservation.

✓ Practise simple ways to save water every day.

Why Is Water So Precious? Although Earth is often called the "Blue Planet," most of its water is salty and found in oceans. Only a small portion is fresh water, and much of that is locked away in glaciers, ice caps or deep underground. The fresh water available in rivers, lakes, wetlands and groundwater must meet the needs of people, agriculture, wildlife and ecosystems. That is why clean fresh water is one of our most valuable natural resources.

The Journey of a Drop; A drop of rain begins an amazing journey. Clouds release rain. Forests slow the falling water. Soil absorbs it. Groundwater stores it. Springs and streams carry it onward. Reservoirs and treatment plants prepare it for homes. We use it carefully. Eventually, it returns to rivers and the sea, ready to begin the water cycle again. Every stage of this journey deserves our care.

Threats to Our Water; Fresh water can be affected by many challenges. These include pollution, littering, untreated sewage, industrial waste, excessive use of chemicals, wasting water, destruction of forests and wetlands, climate change. Protecting water means protecting the entire journey from cloud to sea.

Every Drop Counts; Simple daily actions make a difference. Turn off taps while brushing your teeth. Use a bucket instead of a running hose when appropriate. Take shorter showers. Report leaking taps and pipes. Collect rainwater where suitable and safe. Plant trees to help protect water sources. Avoid throwing waste into rivers, drains or lakes. Thousands of small actions together save millions of litres of water.

Goa Spotlight; Goa's Rivers and its water: Goa receives annual rainfall of 3000 to3500mm, mainly during the southwest Monsoon season from June to September; this heavy rainfall makes the state rich in both surface water and groundwater resources.

Most of Goa rivers originate in the Western Ghats which act as a major catchment area. The rainwater that falls on the mountain and hills flows down under the influence of gravity joining together to form small

streams and tributaries forming main rivers in Goa, because the western Ghats are located close to the Arabian sea , Goa rivers are short, fast-flowing and west-flowing. The major rivers of Goa include the Mandovi, Zuari, Terekhol, Chapora and Sal. Thus, the combination of heavy monsoon rainfall and presence of the Western Ghats makes Goa rich in river system,

Rainwater – Nature's Free Gift; Rainwater harvesting is one of the oldest and wisest ways of conserving water. Rain falling on rooftops can be collected and stored or allowed to recharge groundwater. Benefits include reducing water shortages, replenishing wells, supporting gardens, reducing pressure on public water supplies. Every rainy season offers an opportunity to save water for drier months.

Meet an Eco Hero; Dr. Rajendra Singh – The Waterman of India

Dr. Rajendra Singh has worked with communities across India to restore rivers, revive traditional water-harvesting systems and improve water security. His efforts have shown that when people work together, even rivers that have stopped flowing can come back to life. **His Message** "When we save water, we save life."

Meet a Goan Neighbour; The Khandepar River

Flowing through eastern Goa, the Khandepar River supports villages, farms, wildlife and downstream ecosystems before joining larger river systems.

Why it matters; supplies water for agriculture, supports fish and aquatic life, nourishes nearby forests, contributes to the health of Goa's river network.

How can we help? Never dump waste into rivers. Reduce plastic pollution. Protect riverbanks with native vegetation. Participate in community river clean-up programmes.

Did You Know?

💧 A dripping tap can waste hundreds or even thousands of litres of water over time if not repaired.

🌳 Forests help rainwater soak into the ground, replenishing wells and springs.

🐸 Healthy ponds and wetlands provide homes for frogs, fish, insects and birds.

🚰 Safe drinking water depends not only on treatment but also on protecting rivers and watersheds from pollution.

Hands-on Activity; Become a Water Detective At home or in school, spend one day observing how water is used. Create a simple checklist: Drinking, Cooking, Washing hands, Bathing, Cleaning, Watering plants. Can you identify one way to reduce unnecessary water use without affecting hygiene or health? Share your ideas with your family or classmates.

Family Challenge; Conduct a **Water Audit** at home. Together check for leaking taps, measure how many buckets are used for bathing, collect rainwater if possible, water plants in the early morning or evening, discuss ways to reduce water waste. Create one new family water-saving habit and continue it for a month.

The Gift Box; God's Gift to Us: Water asks for nothing. Yet it gives everything. It nourishes forests. It fills rivers. It grows food. It refreshes people. It sustains every living creature. The greatest way to honour the gift of water is to use it wisely and protect it faithfully.

Quiz Yourself

1. Why is fresh water considered a limited resource?
2. Describe the journey of a drop of water from cloud to home.
3. Name four threats to clean water.
4. Why are forests important for water conservation?
5. What is rainwater harvesting?
6. Name four rivers of Goa.
7. How can leaking taps affect water conservation?
8. What is one way your family can save water?
9. Why are wetlands important?
10. What will you do today to protect every drop?

The Steward's Challenge; For one week, become a **Water Guardian**. Keep a daily record of one water-saving action you practised. At the end of the week, ask yourself: How much water might my family have saved? Which new habit was easiest to continue? Which habit should become a lifelong practice? Remember: Saving water is not about using less life—it is about wasting less of life's greatest gift.

Pause... Look... Wonder...

The next time you hold a glass of water, do not see only a drink. See the clouds that carried it. The forests that welcomed it. The soil that filtered it. The rivers that guided it. The people who protected it. The wildlife that depended on it. Every drop has travelled a long way to reach your hands. Treat it with gratitude. Use it with wisdom. Share it with generosity.

CHAPTER 15

WASTE AND POLLUTION – TURNING PROBLEMS INTO POSSIBILITIES

Learning to Reduce Waste, Protect Nature and Build a Cleaner Future

"The cleanest environment is not created by cleaning alone, but by creating less waste and using resources wisely."

The Two School Gardens

Two neighbouring schools each had a small garden. At the first school, fallen leaves were swept into plastic bags and thrown away. At the second school, students collected the same leaves and placed them in a compost pit. Months later, the first garden needed expensive fertiliser. The second garden was flourishing with rich, dark compost made from what others had called "waste." One student smiled and said, "We didn't throw our garden away." "We helped it become soil again." Their teacher replied, "Nature teaches us that today's waste can become tomorrow's resource."

Pause... Think... Wonder...

Look around your classroom or home. Choose one object. Ask yourself: Where did it come from? How long will I use it? What will happen when I no longer need it? Could it be repaired, reused, shared or recycled? Good environmental choices begin with thoughtful questions.

Learning Objectives; By the end of this chapter you will be able to:

✓ Explain what waste and pollution are.

✓ Identify different types of waste.

✓ Understand how pollution affects people and nature.

✓ Practise the principles of reducing, reusing and recycling.

✓ Discover ways to help keep communities clean and healthy.

What Is Waste? Waste is any material that people no longer need or choose to discard. Some waste breaks down naturally. Examples include leaves, fruit peels, garden trimmings. Other materials may remain in the environment for many years if not managed properly. Examples include plastic bottles, metal cans, some packaging materials, electronic waste. Good waste management helps protect both people and nature.

What Is Pollution? Pollution occurs when harmful substances or excessive waste enter the environment and reduce the quality of air, water or land. Pollution can affect Air, Water, Soil, Sound, Even light at night. Reducing pollution helps create healthier communities and healthier ecosystems.

The Three Rs—and Beyond; One of the simplest ways to reduce waste is to remember the **Three Rs**.

Reduce; Buy only what you need. Avoid unnecessary packaging. Choose durable products.

Reuse; Repair broken items. Use reusable bottles, lunch boxes and shopping bags. Share books, toys and clothes whenever possible.

Recycle; Sort recyclable materials so they can be made into new products. Recycling saves energy and reduces the need for new raw materials.

Recover and Rethink; Where possible, recover useful materials or energy from waste. Before buying something new, ask *"Do I really need this?"* Thoughtful choices prevent waste before it is created.

Composting – Nature's Recycling Factory; Fruit peels, vegetable scraps, dry leaves and garden waste can be turned into nutrient-rich compost. Compost improves soil, helps retain moisture, reduces the need for chemical fertilisers, keeps organic waste out of landfills. Nature has been composting for millions of years. We can learn from its wisdom.

Goa Spotlight; Keeping Goa Clean Goa's beautiful beaches, rivers, forests and villages attract visitors from around the world. Keeping these places clean requires everyone's participation. Many schools, local communities, parishes, resident groups and volunteers organise beach clean-ups, river clean-ups, waste segregation drives, recycling programmes, composting initiatives, awareness campaigns. Every citizen can help preserve Goa's natural beauty.

Pollution and Wildlife; Waste does not stay where we throw it. Plastic carried by rivers may reach the sea. Animals sometimes mistake plastic for food. Polluted water affects fish, frogs and birds. Smoke from burning waste can affect both people and wildlife. By reducing pollution, we help protect the many species that share our common home.

Meet an Eco Hero; Afroz Shah

Afroz Shah inspired thousands of volunteers to restore Mumbai's Versova Beach through regular community clean-up efforts. His work demonstrated that determined citizens working together can transform polluted places into cleaner, healthier environments. **His Message** Small actions become extraordinary when communities work together.

Meet a Goan Neighbour; The Olive Ridley Sea Turtle

Every year, Olive Ridley sea turtles return to India's coastline, including parts of Goa, to nest. **Why they matter:** they are important members of marine ecosystems, they help maintain healthy ocean food webs. **Challenges they face:** plastic pollution, disturbance at nesting beaches, accidental capture in fishing gear, habitat loss. **How can we help?** Keep beaches clean. Reduce plastic waste. Respect nesting areas. Support local conservation efforts.

Did You Know?

♻️ Recycling aluminium uses much less energy than producing new aluminium from raw materials.

🍃 Composting returns valuable nutrients to the soil instead of sending organic waste to landfill.

🐢 Marine animals can be harmed when they mistake floating plastic for food.

🚮 Waste thrown into drains may eventually reach rivers, estuaries and the sea.

Hands-on Activity; Conduct a Waste Audit With your teacher or family, observe one day's waste. Sort it into organic waste, recyclable materials, reusable items, other waste.

Discuss: Which category was largest? Which waste could have been avoided? Which items could have been reused or recycled? Create one practical plan to reduce waste next week.

Family Challenge; Start a **Zero Waste Week**. As a family carry reusable shopping bags, avoid single-use plastic bottles, compost kitchen waste, repair one broken item, donate useful items instead of throwing them away. Celebrate every small success together.

The Gift Box - God's Gift to Us: Wisdom Nature teaches us that nothing is meant to be wasted. When we reduce waste, reuse what we can and recycle wisely, we honour the gifts we have received. A cleaner environment begins not with bigger bins, but with wiser choices.

Quiz Yourself

1. What is waste?
2. What is pollution?
3. Name five kinds of pollution.
4. Explain the Three Rs.
5. Why is composting beneficial?
6. How can plastic pollution affect wildlife?
7. Why should waste be segregated?
8. Name three ways your family can reduce waste.

9. How does recycling conserve natural resources?
10. What action will you begin today to reduce pollution?

The Steward's Challenge; Become a **Waste Wise Champion**. For seven days: Carry a reusable water bottle. Use a reusable shopping bag. Separate waste correctly. Compost fruit or vegetable scraps if possible. Refuse one unnecessary single-use plastic item each day. At the end of the week, reflect: *"Did I create less waste than last week?"*

Pause... Look... Wonder...

Walk through a garden after the rain. Notice the fallen leaves slowly becoming part of the soil. Watch birds collecting small twigs for their nests. See earthworms quietly turning old leaves into fertile earth. Nature does not hurry. Nature does not waste. Everything has a purpose. As stewards of our common home, we are invited to learn the same wisdom—to use what we have with gratitude, to avoid waste whenever we can and to leave our surroundings cleaner and healthier than we found them.

CHAPTER 16

SUSTAINABLE LIVING – SMALL CHOICES, LASTING IMPACT

Living Today with Tomorrow in Mind

"Sustainability begins with everyday choices that care for people, nature and future generations."

The Mango Tree That Fed Three Generations

Outside an old Goan home stood a magnificent mango tree. Grandfather remembered planting it as a young boy. His children had climbed its branches. Now his grandchildren played beneath its shade. Every summer the tree still produced sweet mangoes. One afternoon his granddaughter asked, "Who planted this tree?" "I did," Grandfather smiled. "But I planted it knowing that others would enjoy its fruits long after I was gone." The little girl looked up at the wide branches. "So sustainability," she whispered, "is planting something that someone else will enjoy." Grandfather nodded. "Exactly."

Pause... Think... Wonder...

Look around your home. Which things have been used for many years? Perhaps a wooden table, a bicycle, a favourite book, a family recipe, a fruit tree, a traditional well. Some of the most valuable things are those that are cared for and passed on. That is sustainability in everyday life.

Learning Objectives; By the end of this chapter you will be able to:

✓ Explain what sustainable living means.

✓ Recognise how daily choices affect the environment.

✓ Understand the importance of conserving resources.

✓ Identify practical ways to live more sustainably.

✓ Inspire others through your own example.

What Is Sustainable Living? Sustainable living means making choices that meet our needs while protecting nature and ensuring that future generations also have the resources they need. It means using resources wisely, avoiding unnecessary waste and caring for the world around us. Sustainability is not about living with less joy. It is about living with greater wisdom.

The Three Pillars of Sustainability; A sustainable future depends on balancing three important areas. **Caring for the Environment;** Protect forests, rivers, wildlife, soil and clean air. **Caring for People;** Build healthy, fair and caring communities where everyone has opportunities to thrive. **Caring for Prosperity;** Use resources responsibly, support livelihoods and encourage innovation without harming the environment. When these three pillars work together, communities become stronger and more resilient.

Everyday Sustainable Choices; Small actions practised consistently make a lasting difference. You can walk or cycle short distances. Carry a reusable water bottle. Bring reusable shopping bags. Avoid wasting food. Repair, reuse and recycle whenever possible. Plant native trees and flowering plants. Switch off lights and fans when not in use. Share books, toys and clothes. Choose durable products that last longer. Each small choice becomes part of a more sustainable future.

Food and Sustainability; Our food choices also affect the environment. We can help by reducing food waste, supporting local farmers, growing herbs or vegetables at home, composting food scraps, appreciating seasonal produce. Food is not only nourishment—it is also a precious gift that should never be wasted.

Goa Spotlight; Sustainable Traditions of Goa Long before the word "sustainability" became popular, many Goan families practised sustainable living. Examples include collecting rainwater, using clay pots to keep water cool, repairing household items, sharing seeds, maintaining kitchen gardens, planting coconut, mango and jackfruit trees, making compost, celebrating community harvests. Modern sustainability often builds upon this traditional wisdom while

embracing new technologies such as solar energy and efficient water use.

Sustainable Schools and Communities

Schools and communities can become models of sustainability by planting native trees, practising waste segregation, conserving water, saving energy, creating butterfly gardens, composting organic waste, encouraging environmental education, involving families and the wider community. Every campus can become a living classroom for sustainability.

Meet an Eco Hero; Dr. Gro Harlem Brundtland

Dr. Gro Harlem Brundtland chaired the international commission whose report helped introduce the modern concept of sustainable development to the world. Her work encouraged countries to balance environmental protection, economic progress and social well-being. **Her Message** Development should improve lives today while safeguarding opportunities for tomorrow.

Meet a Goan Neighbour; The Coconut Palm

Often called the "Tree of Life," the coconut palm has supported Goan communities for generations. **Why it is sustainable:** provides food and drink, supplies fibre for ropes and mats, offers leaves for traditional crafts, provides wood for construction, supports local livelihoods. It reminds us that one well-cared-for tree can benefit many people in many different ways.

Did You Know?

🌎 Choosing to repair an item instead of replacing it often saves resources and reduces waste.

🚲 Walking or cycling short journeys helps reduce air pollution while improving health.

🌿 Native plants usually support more local insects, birds and butterflies than many non-native ornamental species.

💡 Energy-efficient appliances can help reduce electricity use over time.

Hands-on Activity; My Sustainable Living Diary For seven days, keep a diary of your sustainable choices. Each day record saved water, saved electricity, walked or cycled, reduced waste, reused something, helped nature. At the end of the week, reflect on which habits were easiest and which you would like to continue.

Family Challenge; Create a **Family Sustainability Plan**. Choose five goals for the next month. Examples reduce electricity use, save water, compost kitchen waste, plant a native tree, buy fewer single-use plastics, grow herbs at home. Review your progress together every week. Celebrate every improvement.

The Gift Box; God's Gift to Us: Wisdom for Tomorrow

The Earth provides enough for our needs when we use its gifts responsibly. Sustainable living is an expression of gratitude. It reminds us that we are borrowing this world from future generations and caring for it on their behalf. Every wise choice becomes a gift that reaches beyond our own lifetime.

Quiz Yourself

1. What is sustainable living?
2. What are the three pillars of sustainability?
3. Name five sustainable habits you can practise every day.
4. Why is reducing food waste important?
5. How did traditional Goan families practise sustainability?
6. Why are native plants valuable?
7. How can schools become more sustainable?
8. Why is repairing items often better than replacing them?
9. What is one sustainability goal your family could begin this month?

10. How does sustainable living benefit future generations?

The Steward's Challenge; Become a **Sustainability Ambassador**. For the next seven days, choose one new sustainable habit and practise it every day. Then encourage one friend or family member to join you. At the end of the week, ask yourself: Which habit was easiest? Which habit made the biggest difference? Which habit will I continue for the rest of the year? Remember: Real change begins when one person's good habit becomes a community's shared way of life.

Pause... Look... Wonder...

Stand beneath a tree that is older than you. Think of the person who planted it. Perhaps they never sat in its shade. Perhaps they never tasted its fruit. Yet because they cared for tomorrow, you benefit today. Now imagine someone standing beneath a tree that you planted many years from now. Sustainable living is built on acts of generosity like this. It is choosing to leave behind cleaner rivers, healthier forests, richer soil, clearer skies and stronger communities—not because we will enjoy all the rewards ourselves, but because caring for the future is one of the greatest expressions of love.

CHAPTER 17

RENEWABLE ENERGY – POWERING A GREENER FUTURE

Using Nature's Gifts Wisely for Tomorrow

"Renewable energy allows us to meet our needs by working with the rhythms of nature rather than exhausting the Earth's limited resources."

The Village That Followed the Sun

In a small village, power cuts often interrupted evening study. One day, the school installed solar panels on its roof. Soon the classrooms had reliable lighting. Students could read after sunset. The computer room stayed open longer. Electricity bills became lower. One evening a young student asked her teacher, "Where does this electricity come from?" The teacher pointed toward the setting sun. "Every morning," she said, "the Sun gives us more energy than we could ever use in a single day." "We are simply learning how to receive that gift wisely." The student smiled. "The Sun shines on everyone." "Yes," the teacher replied, "and that is one reason renewable energy gives us hope."

Pause... Think... Wonder...

Stand outside on a sunny morning. Feel the warmth of the Sun. Notice the breeze. Listen to flowing water. Watch the waves along the shore. These are not only beautiful experiences. They are also powerful sources of clean energy. Nature quietly provides them every day.

Learning Objectives; By the end of this chapter you will be able to:

✓ Explain what renewable energy is.

✓ Distinguish between renewable and non-renewable energy sources.

✓ Identify different forms of renewable energy.

✓ Understand why renewable energy is important for the future.

✓ Discover how families, schools and communities can use energy more wisely.

What Is Energy? Energy is the ability to do work and make things happen. We use energy every day to cook food, travel, light our homes, power schools, run hospitals, operate machines, communicate with others. Modern life depends upon energy. The important question is: **Where does that energy come from?**

Renewable and Non-Renewable Energy; Some energy sources can be replaced naturally within a human lifetime. These are called **renewable energy sources**. Examples include sunlight, wind, flowing water, ocean tides and waves, biomass from plant material and organic waste. Other sources, such as coal, oil and natural gas, formed over millions of years and are used much faster than they can be replaced. These are called **non-renewable energy sources**. Using renewable energy more often can help reduce pollution and conserve finite resources.

The Gifts of Renewable Energy;

Solar Energy The Sun's energy can be converted into electricity using solar panels and into heat using solar water heaters. Goa's sunny climate provides many opportunities to use solar energy in homes, schools and public buildings.

Wind Energy Moving air turns the blades of wind turbines, producing electricity. Wind is a clean source of energy where suitable conditions exist.

Hydroelectric Energy Flowing water can generate electricity. Carefully planned hydroelectric projects can provide renewable energy, while also considering ecological and community impacts.

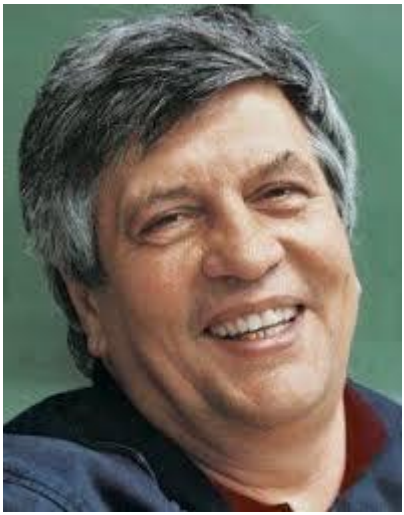
Biomass Energy Organic materials such as agricultural residues and certain types of biodegradable waste can be used to produce useful energy when managed sustainably.

Ocean Energy The movement of tides and waves also contains energy. Scientists continue to develop technologies that can safely harness these natural forces in appropriate locations.

Why Renewable Energy Matters; Renewable energy can reduce greenhouse gas emissions, improve air quality, strengthen energy security, reduce energy costs over time in many situations, support a healthier environment. Using energy efficiently alongside renewable energy creates even greater benefits.

Saving Energy Is Also Important; The cleanest energy is often the energy we do not waste. Simple habits include switching off unused lights, using natural daylight whenever possible, improving ventilation, choosing energy-efficient appliances, walking or cycling short distances. Every unit of energy saved helps conserve resources.

Goa Spotlight; Renewable Energy in Goa; Goa is well placed to expand renewable energy through rooftop solar systems, solar street lighting, solar-powered schools, efficient public buildings, improved energy conservation, research into sustainable coastal energy solutions. By combining traditional wisdom with modern technology, Goa can continue building a cleaner and more resilient energy future.



Meet an Eco Hero; Dr. Hermann Scheer (1944–2010)

Dr. Hermann Scheer was an international advocate for renewable energy. He inspired governments and communities to recognise that clean energy could help protect the environment while creating opportunities for sustainable development. His work encouraged many countries to invest in renewable energy technologies. **His Message** The energy of the future should work in harmony with nature.

Meet a Goan Neighbour; The Coconut Palm and the Sun

Every coconut palm quietly demonstrates the power of renewable energy. Through photosynthesis, it captures sunlight and transforms it into food, fibre, timber and countless products that support families and

livelihoods. The coconut tree reminds us that the Sun has always been one of humanity's greatest partners. Nature has been using solar energy long before we learned to build solar panels.

Did You Know?

🌞 The Sun provides the Earth with far more energy each day than humanity uses.

🌬️ Wind forms because the Sun heats different parts of the Earth unevenly.

💧 Flowing rivers carry energy created by the water cycle, which is also powered by the Sun.

🌿 Plants store solar energy through photosynthesis, making biomass another indirect form of solar energy.

Hands-on Activity; Become an Energy Detective Walk around your home or school. Look for places where energy can be saved. Tick each one you discover. Lights left on unnecessarily. Fans running in empty rooms. Windows that could provide natural light. Appliances switched on but not in use. Opportunities to dry clothes in sunlight instead of using machines. Prepare an "Energy Saving Plan" for your family or class.

Family Challenge; Choose one **Energy Wise Week**. As a family switch off unnecessary lights, make greater use of daylight, reduce unnecessary appliance use, discuss the possibility of future solar energy, walk short distances together when practical. Record how these simple changes helped reduce energy use.

The Gift Box; God's Gift to Us: Renewing Creation

Every sunrise reminds us that creation is continually renewed. Renewable energy invites us to live with gratitude rather than greed. Instead of exhausting the Earth's treasures, we learn to receive wisely, use responsibly and leave enough for those who follow. Clean energy is not only about technology. It is about choosing a future that respects both people and the planet.

Quiz Yourself

1. What is energy?
2. What is the difference between renewable and non-renewable energy?
3. Name five renewable energy sources.
4. Why is solar energy especially suitable for many parts of India?
5. How does wind energy generate electricity?
6. Why is saving energy important?
7. Name three ways families can reduce electricity use.
8. How is biomass connected to sunlight?
9. How can schools encourage renewable energy?
10. What renewable energy project would you like to see in your community?

The Steward's Challenge; Become an **Energy Guardian**. For one week use natural daylight whenever possible. Switch off lights when leaving a room. Turn off fans and appliances when not needed. Walk or cycle one short journey. Keep a record of your energy-saving actions. At the end of the week, ask yourself: *"How did my small choices help care for our common home?"*

Pause... Look... Wonder...

Tomorrow morning, wake up just before sunrise. Watch the first light spread across the sky. Listen to the birds begin their songs. Feel the gentle breeze. Notice how the Earth awakens without smoke, noise or pollution. The greatest source of energy arrives quietly every single day. Nature reminds us that the strongest power is often the gentlest. When we learn to work with these gifts instead of against them, we take another step towards living in harmony with our common home.

CHAPTER 18

HOPE FOR OUR COMMON HOME – BECOMING GUARDIANS OF CREATION

Living with Faith, Wisdom and Love for God's Creation

"Every person can become a guardian of creation by choosing hope, living responsibly and inspiring others to care for our common home."

The Torch of Hope

At the end of the school year, each graduating student received a small candle. The principal lit the first candle and said, "This flame is not a reward." "It is a responsibility." One by one, every student's candle was lit from the first flame. Soon the entire hall glowed with warm light. The principal smiled. "One candle has shared its light with hundreds." "But its own light has not grown weaker." "In the same way, every act of kindness towards creation inspires another." "When you leave this school today, carry this light into the world." The students realised that hope grows brighter when it is shared.

Pause... Think... Wonder...

Think about everything you have discovered throughout this handbook. Which chapter inspired you most? Which new habit have you begun? Which place in nature has become more precious to you? Learning changes the mind. Living changes the world.

Learning Objectives; By the end of this chapter you will be able to:

✓ Reflect on your journey through creation.

✓ Recognise that every person can become a guardian of creation.

✓ Understand the importance of working together.

✓ Make a personal commitment to care for the Earth.

✓ Inspire hope through everyday actions.

What Is Hope? Hope is believing that tomorrow can be better because of the choices we make today. Hope is not pretending that problems do not exist. Hope is planting a tree even though it grows slowly. Hope is cleaning a river even if it takes many hands. Hope is protecting wildlife even when it requires patience. Hope is choosing kindness towards creation every single day.

Becoming a Guardian of Creation; A guardian is someone who protects something precious. We become guardians of creation whenever we plant and care for trees, conserve water, reduce waste, protect wildlife, choose sustainable transport, save energy, work together with others, thank God for the gifts of creation. Being a guardian is not about doing extraordinary things. It is about doing ordinary things with extraordinary care.

We Can Achieve More Together; When families, schools, parishes, neighbourhoods and communities work together, remarkable changes become possible. Together we can restore rivers, plant forests, reduce pollution, create butterfly gardens, protect biodiversity, conserve water, support sustainable farming, inspire future generations. Hope grows strongest in communities.

The Legacy We Leave; Every generation leaves something behind. We can leave cleaner rivers, healthier forests, richer soil, cleaner air, thriving wildlife, stronger communities, wiser habits, grateful hearts. The greatest inheritance we can give future generations is a healthy planet filled with hope.

Goa Spotlight – A Land of Hope; Goa is blessed with mountains, rivers, forests, wetlands, beaches, mangroves and rich biodiversity. Its future depends upon citizens who value these gifts and work together to protect them. Young people have an especially important role. Their ideas, enthusiasm and leadership will shape the Goa of tomorrow.

Meet an Eco Hero; St. Francis of Assisi More than eight hundred years ago, St. Francis reminded the world that every creature reflects the goodness of God. He called the Sun his brother. He called

the Moon his sister. He praised God for water, fire, earth and every living creature. His life continues to inspire millions of people to live simply, love deeply and care joyfully for creation. **His Message** Where there is gratitude for creation, there is hope for the future.

Meet a Goan Neighbour; The Banyan Tree The banyan tree begins as a single seed but grows into a vast shelter for birds, insects, animals and people. Its branches spread wide, sending roots back into the ground, growing stronger with every passing year. It reminds us that one small beginning can grow into a lasting legacy. Like the banyan tree, every good action has the power to grow far beyond what we first imagine.

Did You Know?

🌍 More than eight billion people share one common home—the Earth.

🌱 A single mature tree can support countless forms of life, from insects and birds to fungi and mammals.

🤝 Community action often achieves far more than individual effort alone.

💚 Hope grows whenever people work together to solve problems with creativity and compassion.

Hands-on Activity; My Guardian of Creation Plan Write your own plan. This year I will: Plant _____ trees. Save water by _____. Reduce waste by _____. Protect wildlife by _____. Teach others about _____. Volunteer in _____. Keep your plan somewhere visible and review it throughout the year.

Family Challenge; Hold a **Creation Celebration Evening**. As a family share what each person has learned, choose one environmental project to support, plant a tree or begin a small garden, pray together in thanksgiving for creation, make one family promise for the coming year. Let your home become a place where care for creation is practised with joy.

The Gift Box; God's Gift to Us: A Shared Home God has entrusted us with a world filled with beauty, diversity and abundance. We honour this gift when we protect it with wisdom, share it with generosity and pass it on in better condition than we received it. Creation is not only a place where we live. It is a family to which we belong.

Quiz Yourself

1. What is hope?
2. What does it mean to be a guardian of creation?
3. Name five ways you can care for the environment.
4. Why is community action important?
5. How does St. Francis of Assisi continue to inspire people today?
6. Why is the banyan tree a symbol of hope?
7. What legacy would you like to leave?
8. How can your family care for creation together?
9. What is one project your school could begin?
10. What promise will you make to God and to future generations?

The Steward's Challenge; Become a **Guardian of Creation** for life. Choose one environmental action that you will continue throughout the coming year. Invite at least one friend or family member to join you. Remember that every great movement begins with one person willing to take the first step.

My Guardian of Creation Pledge

With gratitude to God, I promise to respect every form of life. I will protect water, air, soil and forests. I will use the Earth's gifts wisely. I will reduce waste and live simply. I will care for animals and plants. I will encourage others to protect our common home. I will never lose hope. With God's help, I will strive each day to become a faithful Guardian of Creation. Amen.

Pause... Look... Wonder...

As you close this handbook, step outside for a moment. Look at the sky above you. Listen to the birds. Feel the breeze. Touch the soil. Watch a tree swaying gently in the wind. Remember that every one of these gifts

has been placed into our care. The story of creation did not end when this book reached its final page. It continues every morning with the sunrise, every season with the rain and every time someone chooses kindness over carelessness.

The next chapter is not written in this handbook. It will be written by you. May your hands plant hope. May your words inspire others. May your life become a song of gratitude for God's beautiful world. Go forward with courage. Go forward with joy. Go forward as a Guardian of Creation.

The Journey Continues...

"The Earth does not belong to us.

We belong to the Earth.

May what you have learned

in these pages become visible

in the way you live."

The one final sentence

The next chapter of this handbook

is the one you will write

through your own life.

My Guardian of Creation Pledge

A Promise to Care for Our Common Home

Today, with gratitude for the beautiful world we share, I make this promise. I will open my eyes to the wonder of creation. I will respect every person, every animal, every plant and every living thing. I will use water, food, energy and all natural resources wisely, remembering that they are precious gifts. I will reduce waste, reuse what I can and recycle whenever possible. I will keep my home, school, neighbourhood and community clean. I will protect trees, rivers, forests, beaches, wildlife and all places that give life to our planet. I will choose kindness over carelessness and responsibility over convenience. I will continue to learn about nature and share what I discover with my family and friends. I will encourage others to care for our common home through my words and my actions. With hope in my heart and respect for all creation, I promise to do my part in building a cleaner, greener, healthier and more peaceful world for present and future generations.

My Promise; I will Wonder…. I will Understand…. I will Care…. I will Act…. I will Inspire.

This is my promise as a Guardian of Creation.

100 Simple Ways to Care for Our Common Home

Small Actions • Big Difference

"Never believe that one small action cannot change the world. Every great forest begins with a single seed."

🌳 THEME 1 ; Love Trees

1. Plant a native tree.
2. Water a young sapling regularly.
3. Protect an old tree in your neighbourhood.
4. Learn the names of five native trees.
5. Grow a flowering plant for butterflies and bees.
6. Never carve or damage tree bark.
7. Collect seeds and grow new plants.
8. Celebrate Van Mahotsav by planting a tree.
9. Thank someone who cares for trees.
10. Inspire a friend to plant a tree.

💧 THEME 2; Save Water

11. Turn off dripping taps.
12. Use only the water you need.
13. Collect rainwater for plants.
14. Water plants during the cool hours.
15. Never throw waste into rivers or streams.
16. Protect wells and ponds.
17. Report leaking pipes.
18. Reuse water whenever safe.
19. Learn where your drinking water comes from.

20. Value every drop of water.

🦋 THEME 3; Protect Wildlife

21. Watch birds quietly.
22. Never disturb nests.
23. Protect butterflies and caterpillars.
24. Observe insects without harming them.
25. Learn about local wildlife.
26. Keep beaches clean for turtles.
27. Protect mangroves.
28. Help injured wildlife through authorised rescuers.
29. Leave wild animals in the wild.
30. Celebrate Wildlife Week.

♻️ THEME 4; Reduce Waste

31. Carry a reusable water bottle.
32. Carry a cloth shopping bag.
33. Avoid single-use plastics.
34. Compost kitchen waste.
35. Recycle paper and cardboard.
36. Repair instead of replacing.
37. Donate books and toys.
38. Refuse unnecessary packaging.
39. Separate wet and dry waste.
40. Think before throwing something away.

🌞 THEME 5; Save Energy

41. Switch off lights when leaving a room.

42. Use natural daylight whenever possible.
43. Turn off fans and appliances when not in use.
44. Walk short distances.
45. Ride a bicycle whenever possible.
46. Use public transport.
47. Plant shade trees around buildings.
48. Learn about solar energy.
49. Reduce unnecessary electricity use.
50. Encourage your family to save energy.

🏡 THEME 6; Care at Home

51. Keep your home clean.
52. Help separate household waste.
53. Grow herbs or vegetables.
54. Avoid wasting food.
55. Feed birds responsibly.
56. Plant flowers for pollinators.
57. Use eco-friendly cleaning products where possible.
58. Celebrate Earth Hour.
59. Help with household chores.
60. Be thankful for nature's gifts.

🏫 THEME 7; Care at School

61. Keep your classroom clean.
62. Never litter.
63. Respect school gardens.
64. Save paper.

65. Share books with classmates.
66. Join your Eco Club.
67. Protect trees on the school campus.
68. Switch off classroom lights and fans.
69. Help younger students care for nature.
70. Lead by example.

🌎 THEME 8; Care for Your Community

71. Join a community clean-up.
72. Plant trees in public spaces.
73. Celebrate Earth Day.
74. Celebrate World Environment Day.
75. Celebrate World Water Day.
76. Support local farmers.
77. Respect sanitation workers.
78. Protect public parks.
79. Volunteer for an environmental activity.
80. Encourage your neighbours to care for nature.

💔 THEME 9; Care for People

81. Be kind to everyone.
82. Share what you have.
83. Respect people from every background.
84. Help older people when needed.
85. Listen carefully to others.
86. Forgive quickly.
87. Work together as a team.

88. Encourage someone every day.

89. Share a smile.

90. Build peace wherever you are.

🌟 THEME 10; Inspire Others

91. Read a book about nature.

92. Keep a nature journal.

93. Observe birds regularly.

94. Photograph nature responsibly.

95. Learn one new environmental fact each week.

96. Teach a younger child about nature.

97. Start a small eco-project.

98. Share good environmental ideas.

99. Never stop asking questions.

100. Live every day as a Guardian of Creation.

My Progress

☐ I have completed 10 actions.

☐ I have completed 25 actions.

☐ I have completed 50 actions.

☐ I have completed 75 actions.

☐ I have completed all 100 actions.

Congratulations! Every small action makes our common home greener, healthier and more beautiful.

Creation Calendar

A Year of Caring for Our Common Home

"Every season teaches us something. Every month gives us a new opportunity to care for creation."

JANUARY; New Beginnings - Theme: Begin with Gratitude

Important Days; • 26 January – Republic Day (India)

Ideas for Action; ✓ Plant a tree in your home or school. ✓ Start a Nature Journal. ✓ Learn the names of five local birds.

Family Challenge; Spend one hour outdoors together observing nature.

FEBRUARY; Celebrating Biodiversity - Theme: Every Living Thing Matters

Ideas for Action; ✓ Observe butterflies. ✓ Visit a local garden. ✓ Grow flowering plants for pollinators.

Family Challenge; Create a butterfly-friendly corner at home.

MARCH; Water Is Life - Theme: Every Drop Counts

Important Days 3 March – World Wildlife Day, 21 March – International Day of Forests, 22 March – World Water Day

Ideas for Action; ✓ Save water every day. ✓ Clean a neighbourhood water source if organised safely. ✓ Learn about Goa's rivers.

Family Challenge; Reduce your household water use this month.

APRIL; Caring for Our Planet - Theme: Our Common Home

Important Days; 22 April – Earth Day

Ideas for Action; ✓ Organise a clean-up drive. ✓ Walk or cycle whenever possible. ✓ Reduce plastic use.

Family Challenge; Celebrate an Earth-Friendly Day at home.

MAY; Celebrating Life - Theme: Protect Biodiversity

Important Days; 22 May – International Day for Biological Diversity

Ideas for Action; ✓ Observe insects and birds. ✓ Visit a nature trail. ✓ Learn about native trees.

Family Challenge; Photograph five different living things near your home.

JUNE; Greener Tomorrow - Theme: Restore Nature

Important Days; 5 June – World Environment Day, 8 June – World Oceans Day, 17 June – World Day to Combat Desertification and Drought

Ideas for Action; ✓ Plant native trees. ✓ Avoid single-use plastics. ✓ Protect beaches and rivers.

Family Challenge; Plant and care for a native tree together.

JULY; Monsoon Wonders - Theme: Life Begins with Rain

Ideas for Action; ✓ Observe rainwater harvesting. ✓ Watch frogs and dragonflies. ✓ Record rainfall.

Family Challenge; Grow vegetables or herbs during the monsoon.

AUGUST; Green Communities - Theme: Working Together

Ideas for Action; ✓ Keep your surroundings clean. ✓ Support local farmers. ✓ Reduce food waste.

Family Challenge; Prepare a meal using locally grown produce.

SEPTEMBER; Season of Creation - Theme: Hope for Our Common Home

Important Days; 1 September – World Day of Prayer for the Care of Creation, 16 September – World Ozone Day, Third Saturday – International Coastal Cleanup Day, Fourth Sunday – World Rivers Day

Ideas for Action; ✓ Celebrate the Season of Creation. ✓ Join a beach or river clean-up. ✓ Plant native species.

Family Challenge; Complete ten acts of care for creation together.

OCTOBER; Living Like Guardians - Theme: Caring Through Action

Important Days; 2 October – Gandhi Jayanti, 4 October – Feast of St. Francis of Assisi & Conclusion of the Season of Creation

Ideas for Action; ✓ Feed your compost. ✓ Protect wildlife. ✓ Inspire others to care for nature.

Family Challenge; Make a family pledge to continue caring for creation throughout the year.

NOVEMBER; Gratitude for Nature - Theme: Sharing Nature's Gifts

Ideas for Action; ✓ Visit a forest or nature park. ✓ Learn about migratory birds. ✓ Thank people who care for the environment.

Family Challenge; Write five things you are thankful for in nature.

DECEMBER; Hope for the Future - Theme: Looking Ahead

Important Days; 5 December – World Soil Day, 11 December – International Mountain Day

Ideas for Action; ✓ Care for soil. ✓ Review your year's achievements. ✓ Plan next year's environmental goals.

Family Challenge; Celebrate your family's "Guardian of Creation" achievements and plan one new environmental commitment for the coming year.

Our Family's Annual Creation Promise

Throughout this year, our family will continue to: Protect nature, save water, plant trees, reduce waste, care for wildlife, inspire others.

"Every month is another opportunity to care for our common home."

Our Common Home

An Illustrated Handbook for Young Guardians of Creation

This handbook is an invitation to every child to explore, understand and care for the beautiful world we call home.

May each page help you discover the wonder of creation and inspire you to become a faithful guardian of our Earth.

Archdiocese of Goa & Daman

St. Anne Parish Ponda

DIOCESAN COMMISSION FOR ECOLOGY

CARE FOR CREATION

Let us walk together. Let us care together. Let us heal together.

Our Common Home.