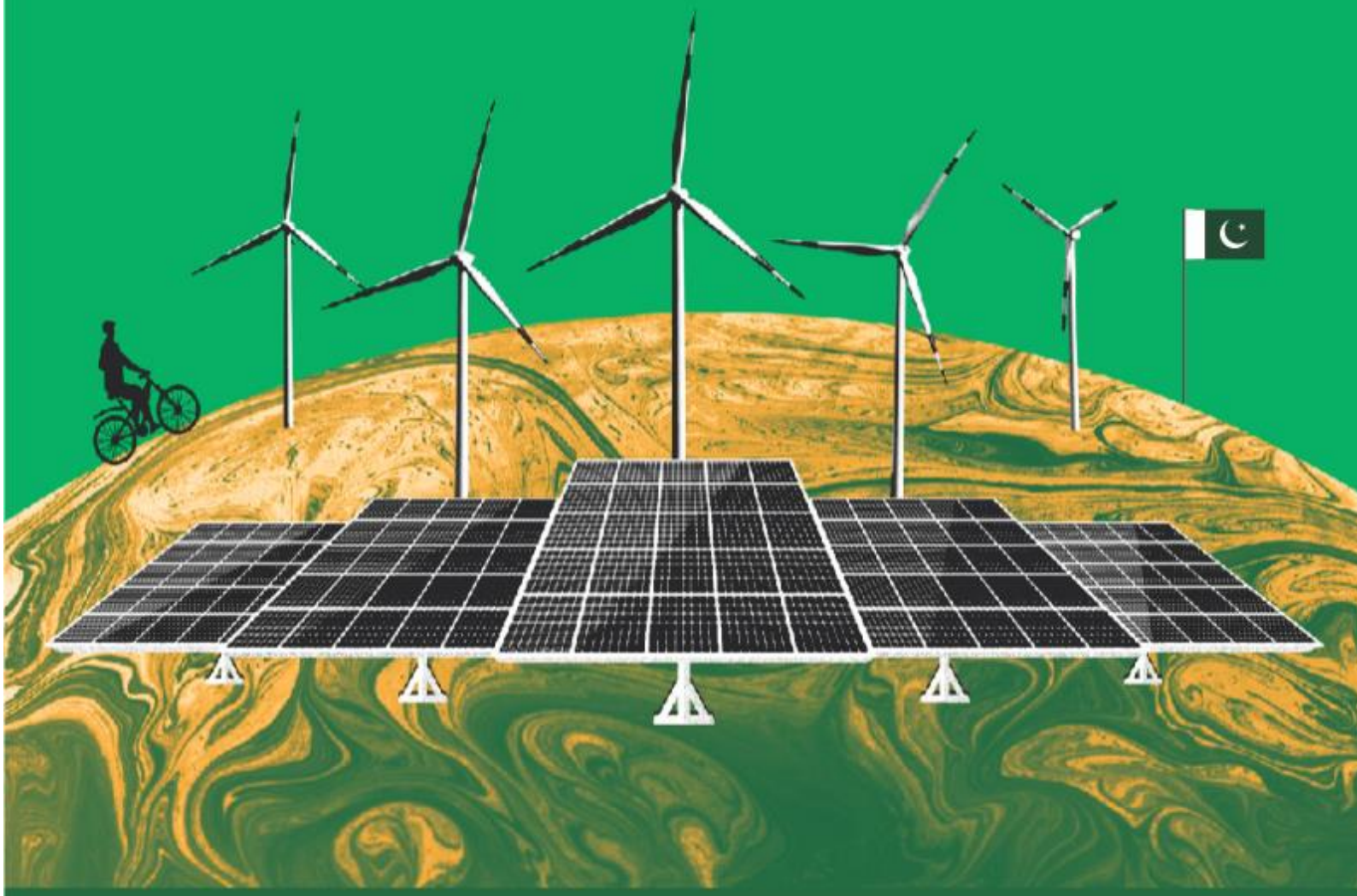
CLIMATE DEFENDERS

Category-3 Guidebook

For students from grades 8 to 12



Green Living Pakistan

About the Guidebooks

Climate Change is no longer a distant concern—it is the reality we live with every day. From intense monsoon rains and cloudbursts to heatwaves and floods, Pakistan is already among the most climate-vulnerable countries in the world. Our classrooms are filled with students whose families, communities, and futures are directly impacted by these changes. This makes climate education not just a subject, but a **lifeline for resilience, awareness, and action.**

As educators, we are entrusted with preparing the next generation not only to excel academically but also to become responsible citizens who can face global challenges with courage and knowledge. By guiding students through understanding the causes, impacts, and solutions, we help them **connect science with everyday life and empower them to be part of the solution**.

A central theme in the guidebooks is the **green energy transition**—shifting from fossil fuels to renewable sources such as solar, wind, and hydropower. This transition is one of the most powerful tools we have to **mitigate Climate Change** by reducing harmful emissions. At the same time, it offers Pakistan new opportunities for innovation, green jobs, and sustainable development. Students must see themselves not only as victims of Climate Change but as **leaders of change**, capable of shaping a cleaner and brighter future for their communities and their nation.

The ***Climate Defenders*** guidebooks are created to present these vital concepts in simple, age-appropriate language, enriched with real-life examples from Pakistan. Each section is carefully structured to build students' understanding—starting from the fundamentals of climate science and moving toward practical actions they can take at home, in school, and within society. Through these lessons, we aim not only to **expand participants' knowledge** but also to nurture their **skills, values, and sense of responsibility** to actively respond to the climate crisis.

Developing the comprehensive project ***'Climate Defenders'*** for Green Ambassadors and their families has been a true challenge, given the need to accommodate students of different educational levels, diverse subjects, and varied institutions. Thanks to the dedicated efforts of **GLP's technical team, our global partners**, and **volunteer associates**, this vision has been successfully realized.

The implementation of this project would not have been possible without the active support of the committed management teams of our **Green Partner Schools and Campuses**, along with the enthusiastic participation of Green Ambassadors and their families. We sincerely thank you for your contribution and look forward to your continued partnership in shaping a **sustainable and dynamic society**, safeguarded against environmental threats.

This guidebook has been established under the ‘Green Studies’ approach, without using the booklet or any of its part as printed material.

Green Living Pakistan

Section 1: Understanding Climate Change

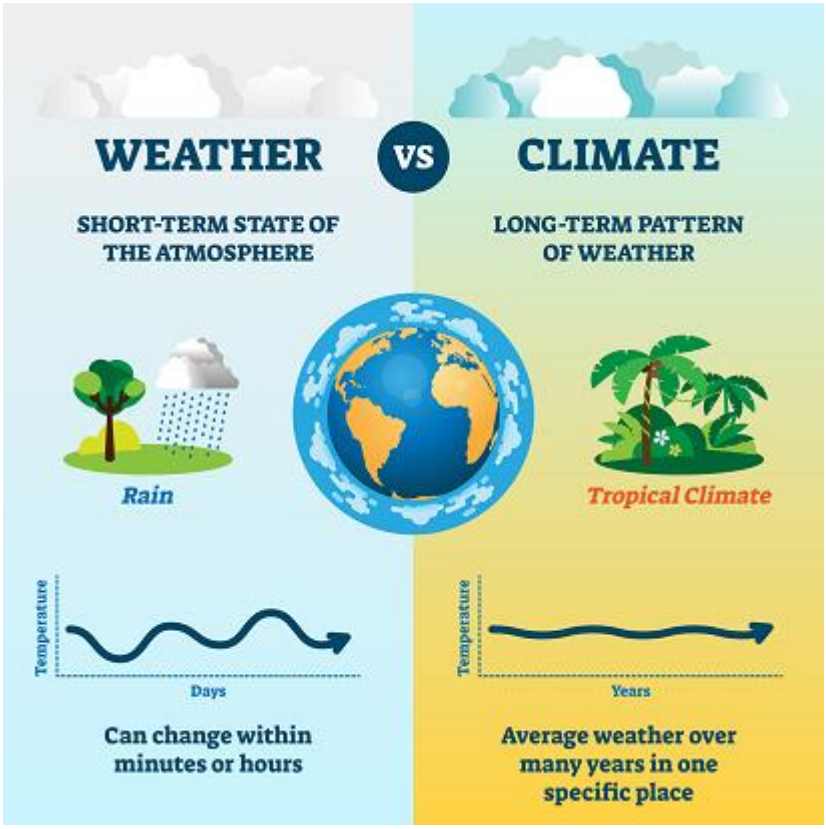
What is Climate Change?

Dear students, picture yourselves playing on a bright, sunny afternoon outdoors. Suddenly, dark clouds roll in and a heavy shower begins. You quickly grab your sports gear and rush for shelter. The sunshine and rain you just experienced are examples of ***weather***—conditions that can shift within minutes or hours.

But what if summers in your city start becoming hotter every year? What if winters are not as cold as they used to be? What if rainfall comes at unexpected times, bringing floods instead of gentle showers? That long-term pattern is what we call ***climate***.

So, **Climate Change** means a lasting shift in the usual weather patterns—temperatures, rainfall, storms, and seasons—over many years. It does not mean that every day will be hot or rainy, but that the **overall balance of nature is changing**.

Difference between Weather and Climate

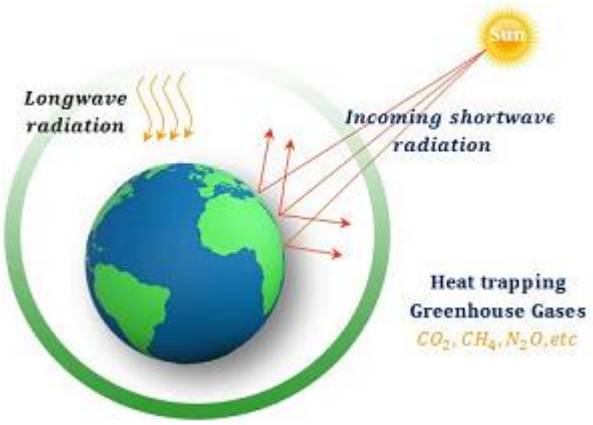


Let's make it simple:

- **Weather** is your mood today. It can be happy (sunny), sad (rainy), or angry (stormy).
- **Climate** is your personality. It is what people know you for over a long time.

For example, the weather in Lahore today may be rainy, but the climate of Lahore is generally hot in summers and mild in winters. Climate is the bigger picture; weather is the short story of the day.

Global Warming and the Greenhouse Effect



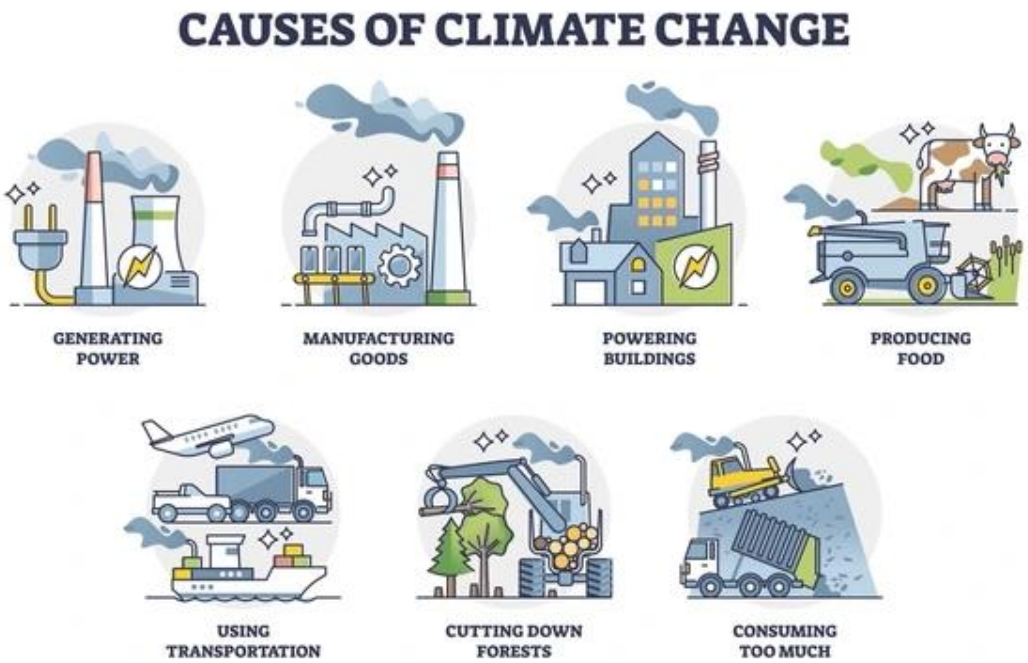
Have you ever sat inside a car parked in the sun? The windows let sunlight in, but the heat gets trapped inside. Within minutes, the car becomes uncomfortably hot. This is exactly what happens to our Earth.

Our planet is surrounded by a thin blanket of gases like carbon dioxide (CO_2), methane (CH_4), and water vapour. This blanket is called the **atmosphere**. Normally, it keeps Earth warm enough for us to live—this is called the **greenhouse effect**. Without it, Earth would be as cold as the moon!

But here's the problem: when humans burn too much coal, oil, and gas, we release extra greenhouse gases. This makes the blanket thicker, trapping more heat. As a result, Earth becomes hotter and hotter. This rise in Earth's average temperature is called **global warming**.

And when Earth gets warmer, the entire climate system—rains, storms, glaciers, seas—gets disturbed. That's **Climate Change**.

Causes of Climate Change



Climate can change naturally, but in today's world, humans are the main drivers. Let's explore both:

Natural Causes

- **Volcanoes:** When a volcano erupts, it releases ash and gases that can cool or warm the atmosphere.
- **Solar changes:** The sun's energy is not always constant. Small changes affect

Earth's temperature.
- **Ocean patterns:** Movements of oceans, like El Niño, can cause temporary warming or cooling.

These natural causes have always existed, but they happen over centuries.

Human-Made Causes

Over the last 175 years, human activities have changed the climate much faster. Here's how:

1. **Fossil Fuels**
    - To drive cars, run factories, and produce electricity, we burn coal, oil, and gas.
    - This releases huge amounts of carbon dioxide (CO_2) into the air.
    - More CO_2 = thicker blanket = hotter Earth.
2. **Deforestation**
    - Trees are nature's air purifiers. They absorb CO_2 and give us oxygen.
    - But when we cut forests for cities, roads, and firewood, we lose this protection.
    - Imagine Earth with fewer trees: the heat remains trapped.
3. **Industrialization**
    - Factories produce smoke, chemicals, and waste.
    - This pollutes air and water while adding greenhouse gases.
    - Many industries in developing countries like Pakistan are still using outdated, harmful technologies.
4. **Population Growth**
    - More people mean more cars, houses, factories, and waste.
    - Pakistan's population has crossed 240 million, putting huge pressure on natural resources.

So, while nature does play a role, humans have become the biggest reason for today's climate crisis.

Climate Change and Pakistan

Now, let's talk about home—**Pakistan**. You may have heard in the news that Pakistan is among the **top 10 most climate-vulnerable countries** in the world. But why?

1. **Geography**
    - Pakistan has mountains with glaciers (Gilgit-Baltistan), deserts (Thar), fertile plains (Punjab), and a long coastline (Karachi, Gwadar).
    - Climate Change affects each of these differently: glaciers melt, deserts face drought, plains face floods, and coastal areas face rising sea levels.
2. **Dependence on Agriculture**
    - About 40% of Pakistan's people depend on farming.
    - When rainfall patterns change or floods destroy crops, millions suffer.
    - The 2022 floods drowned huge farmlands, causing food shortages.

3. **Extreme Weather Events**
    - **Floods:** Monsoon rains are becoming heavier, causing flash floods and urban flooding.
    - **Heatwaves:** Karachi has seen deadly heatwaves in recent years.
    - **Cloudbursts:** Sudden, heavy downpours in northern areas destroy villages and roads.
    - **Glacial lake outburst floods (GLOFs):** As glaciers melt, lakes form and burst, flooding valleys.
4. **Lack of Resources**
    - Unlike richer countries, Pakistan has fewer resources to fight disasters.
    - Our cities are crowded, drains are blocked, and emergency systems are weak.
    - This makes floods, heatwaves, and storms more dangerous.
5. **Population Pressure**
    - With such a large population, more houses are built in risky floodplains and near rivers.
    - When floods come, thousands of families are displaced.

Why Students Should Care

Dear students and supporters, Climate Change is not something far away. It is happening **right now** in our country. You may have seen news about people losing their homes in floods, farmers losing crops, or families struggling with extreme heat. This is real.

But here's the hopeful part: **you are not powerless.** Understanding Climate Change is the first step to fighting it. Every small action—planting trees, saving electricity, avoiding plastic—adds up. And as the future scientists, leaders, and responsible citizens of Pakistan, you can make choices that protect your environment.

Section 2: Impacts around Us

Now that we understand what Climate Change is and why it is happening, let us look at how it is **affecting our lives**. Climate Change is not just about hotter summers or longer winters. It is about how our food, health, homes and future are being put at risk. In this section, we will explore the **impacts of Climate Change around us**, especially in Pakistan.

Monsoon Rains and Cloudbursts

You may have noticed that monsoon rains in Pakistan have become more intense in recent years. Instead of gentle showers that farmers need for crops, we often get **sudden, heavy downpours** that flood cities and villages.

- **Why is this happening?**
  Warmer air holds more moisture. As temperatures rise, more water evaporates from rivers, lakes, and the sea. This leads to heavier rainfall when clouds burst.
- **Monsoon in Pakistan**
  Monsoon usually comes between July and September. Earlier, it used to bring life to crops, fill rivers, and refresh the land. But now, the same monsoon can bring **disaster**:
    - Urban flooding in Karachi, Lahore, and Islamabad.
    - River floods destroying villages in KPK, Sindh and Punjab.
    - Landslides in northern areas like Swat and Gilgit-Baltistan.

- **Cloudbursts**
  Sometimes, clouds release a huge amount of rain in just a few minutes. This is called a **cloudburst**. Imagine standing under a water tank that suddenly empties on you—that's how destructive it can be. In the northern mountains, cloudbursts wash away homes, bridges, and roads in seconds.

Example: In August 2022, Pakistan saw record-breaking rains. Nearly one-third of the country was under water, millions of people were displaced, and thousands of schools were damaged. This was not just a natural disaster—it was worsened by Climate Change.

Impact on Agriculture and Food Security

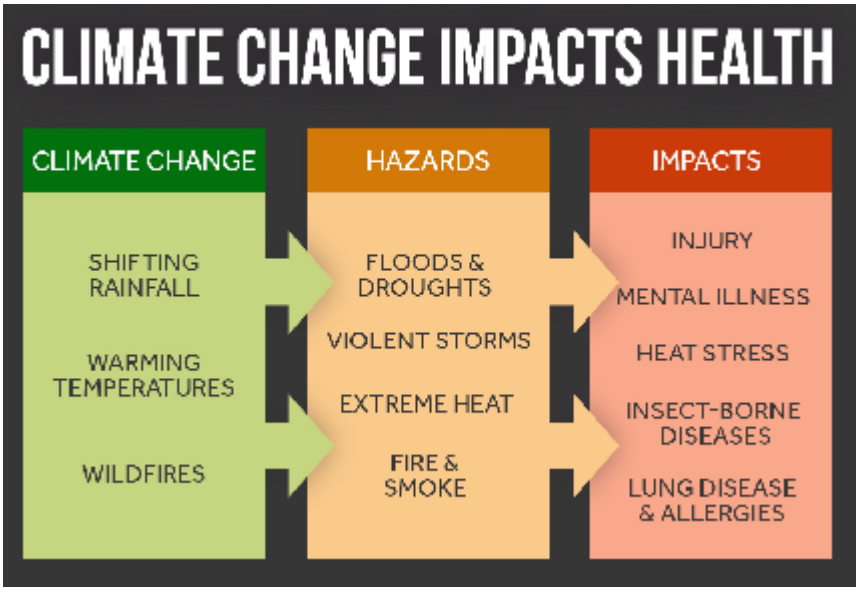
Pakistan is called an **agricultural country**. Almost 40% of our people work on farms, growing wheat, rice, sugarcane, cotton, fruits, and vegetables. But Climate Change is making farming much harder:

- **Unpredictable Rains:** Farmers used to know when the rains would come, but now rains are late, too early, or too heavy. Crops either dry up or drown.
- **Heat Stress:** Some crops like wheat cannot survive extreme heat. If the temperature rises too high, the yield goes down.
- **Pest Attacks:** Warmer weather increases pests and diseases. For example, cotton crops often get ruined by insects during hot and humid weather.
- **Food Prices:** When crops fail, food becomes expensive. Families with low income suffer the most.

Example: During the 2022 floods, around **45% of Pakistan's cropland** was damaged. Millions of farmers lost their harvest. Food prices of onions, tomatoes, and wheat shot up in markets.

So, Climate Change is not just about weather—it affects what we eat every day.

Impact on Health



Our health is directly linked to the climate. When disasters strike, people not only lose homes but also fall sick.

1. **Diseases After Floods:**
    - Floodwater mixes with sewage and spreads bacteria.
    - People get waterborne diseases like diarrhoea, cholera, and typhoid.
    - Mosquitoes breed in standing water, spreading malaria and dengue.
2. **Heatwaves:**
    - Very high temperatures cause heatstroke, dehydration, and exhaustion.
    - The 2015 Karachi heatwave killed more than **1,200 people** in just a few days.
3. **Respiratory Illnesses:**
    - Hotter weather and air pollution cause breathing problems, especially in children and the elderly.
    - Smog in Lahore, Karachi and other cities gets worse in winter due to industrial smoke and vehicle emissions.
4. **Mental Health:**
    - Losing homes and loved ones in floods or disasters causes stress and trauma, especially for children.

Impact on People and Economy

Climate Change does not just damage nature—it changes human lives in big ways.

- **Displacement:** Every year, thousands of families are forced to leave their homes because of floods, landslides, or droughts. They move to crowded camps or cities where life is very difficult.
- **Education Loss:** Schools are destroyed or turned into relief shelters during floods. Students in affected areas miss months of classes.
- **Job Loss:** Farmers, shopkeepers, and labourers lose their livelihoods when crops fail or markets close after disasters.
- **Damage to Infrastructure:** Roads, bridges, electricity lines, and water systems are destroyed, costing billions of rupees.

Example: The 2022 floods cost Pakistan more than **30 billion dollars** in damages. That money could have been used for schools, hospitals, and development, but now it has to be used for rebuilding.

Why Pakistan is Hit So Hard

You might be wondering: if Climate Change is a global problem, why is Pakistan suffering more than some richer countries? The answer lies in a few reasons:

1. **Geographical Location:**
    - Pakistan has glaciers in the north, deserts in the south, fertile plains, and a coastline. Climate Change impacts all these areas differently, making us more exposed to risks.
2. **Population Pressure:**
    - With more than 240 million people, there is pressure on food, water, and land. When disasters strike, more people are affected.
3. **Limited Resources:**
    - Rich countries can build advanced flood defences and cooling systems. Pakistan does not have enough resources to prepare for every disaster.
4. **Dependency on Nature:**
    - Our economy depends on farming, which depends on weather. So, when the Climate Changes, our economy suffers directly.

Why Students Should Care About Impacts

Dear students, you may be thinking: "I am just a student, what can I do?" But here's the truth: the future belongs to you. The impacts we discussed—floods, food shortages, diseases—will affect your generation the most. By understanding these issues, you can be more prepared and can also **inspire your families, schools, and communities** to act responsibly.

Quick Recap

- Climate Change causes heavier monsoons and dangerous cloudbursts.
- Agriculture is suffering, which leads to food shortages and higher prices.
- Human health is at risk from diseases, heatwaves, and pollution.
- People lose homes, jobs, and education during disasters.
- Pakistan is among the most vulnerable countries because of geography, population, and limited resources.

Section 3: Actions to Address Climate Change

Climate Change is a challenge that affects the whole world, but we can fight it together through responsible actions at every level – global, national, and local. By acting wisely, we can protect our environment, communities, and future generations.

Global Level

At the international level, all countries, especially the industrialized nations, must:

- **Respect Treaties and Commitments:** Industrialized countries should strictly honour international agreements such as the Paris Agreement and reduce their reliance on fossil fuels.
- **Invest in Green Energy:** Shift towards renewable energy sources like solar, wind, and hydropower.
- **Support Developing Nations:** Provide financial and technical assistance to countries like Pakistan to help them adapt to and mitigate the impacts of Climate Change.

National Level (Pakistan)

Pakistan is highly vulnerable to the impacts of Climate Change, so national-level actions are crucial:

- **Policy and Legislation:** Implement strict environmental protection laws and promote renewable energy nationwide.
- **Reforestation and Afforestation:** Launch large-scale tree-planting campaigns to improve air quality and reduce carbon emissions.
- **Sustainable Agriculture:** Encourage climate-smart farming methods to protect crops and soil health.

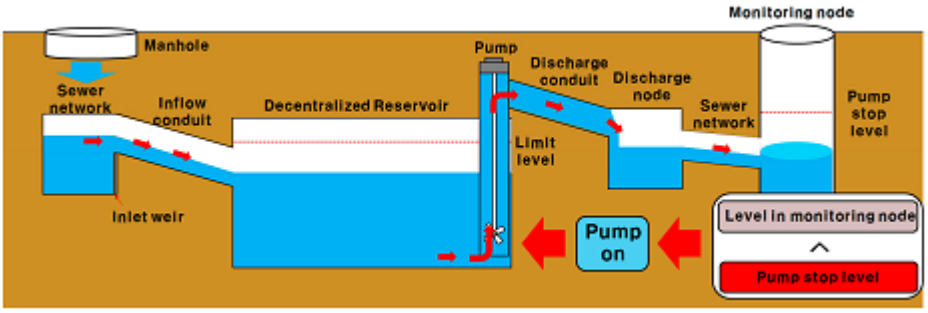
Mountain Areas

The mountain regions of Pakistan face increasing risks from glacial melting, floods, and cloud bursts. Take safeguard measures in these areas:

- **Modern Forecasting Systems:** Install advanced weather forecasting and early warning systems to provide timely alarms to villages about upcoming disasters such as cloud bursts or flash floods.

- **Community Training:** Train local communities on how to respond quickly and safely during emergencies.
- **Protect Forests and Watersheds:** Prevent deforestation to reduce soil erosion and maintain the natural balance of water flow.

Urban Areas



Cities in Pakistan are becoming more vulnerable to heat waves, flooding, and water shortages. To make our urban areas climate-resilient:

- **Efficient Drainage Systems:** Develop modern drainage networks to quickly evacuate rain and floodwater from city streets.
- **Water Reservoirs and Lakes:** Construct large ponds and reservoirs outside cities to store excess floodwater. This stored water can later be treated and supplied for household use.
- **Green Urban Planning:** Increase green spaces, plant trees, and design eco-friendly buildings to reduce heat and pollution.

Remember: Every step, whether taken globally, nationally, or locally, helps us reduce the threats of Climate Change and build a safer, greener future. Students like you can play a leading role by spreading awareness, practicing eco-friendly habits, and inspiring others.

Disaster Preparedness

Since Pakistan faces floods, heatwaves, and storms regularly, it is very important to **be prepared**. Preparedness saves lives.

1. During Floods

- Move to higher ground quickly if heavy rains cause flooding.
- Do not walk or play in floodwater—it can carry diseases and be very deep.
- Keep important documents, clothes, and food in waterproof bags.

2. During Heatwaves

- Drink plenty of water.
- Wear light-coloured, loose clothing.
- Avoid going outside in the afternoon when the sun is strongest.
- Take care of children and elderly people—they are most at risk.

3. During Storms or Cloudbursts

- Stay indoors if heavy rain or storms are forecast.
- Do not take shelter under trees during lightning.
- Avoid using mobile phones outdoors in heavy lightning.

Flood-Management Using Natural Sand Base of the Indus

1. Natural Sand as a Buffer

- The Indus River carries extensive **sediment loads—sands, silts, and alluvium—especially during monsoon surges**. Naturally, these materials settle on floodplains and riverbanks, forming **natural levees** over time. These ridges increase channel capacity and help contain floodwaters.

2. Reinforcing Natural Levees (Soft Engineering Approach)

- Rather than relying solely on artificial embankments, this approach could involve enhancing **naturally formed levees**—by preserving or augmenting sediment deposition zones—and stabilizing them using **biological techniques** like planting deep-rooted native tree species (e.g., *Acacia nilotica*) to bind soil and reduce erosion.

3. Controlled Sediment Deposition

- Through careful river management—like strategic placement of **spurs or groynes**—we can guide where sediments settle naturally. This helps build up protective barriers over time, using sediment that's already being transported downstream.

4. Avoiding Harmful Sand Extraction

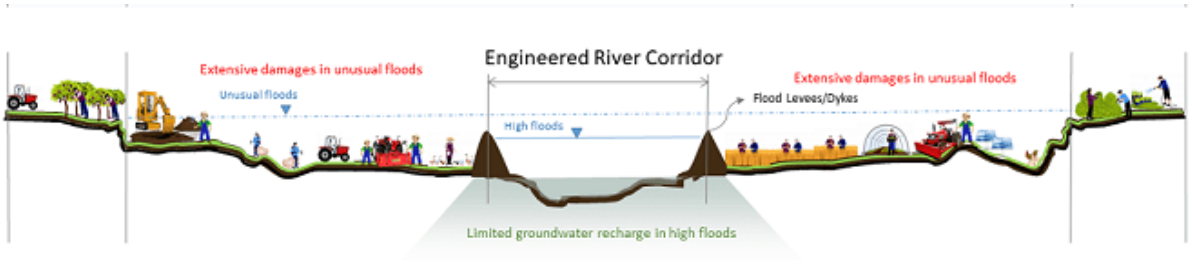
- Extraction of sand from the riverbed weakens embankments and destabilizes the natural flood protection zone. Restricting or regulating sand mining preserves the integrity of the river's natural buffer layers.

5. Integrated, Holistic Planning

- This strategy aligns with **integrated flood management frameworks**, blending natural defences (like sand deposition zones and vegetation) with traditional engineered structures and community planning

Sand–Base Flood Mitigation (Nature-Aligned Strategy)

Benefits:



1. **Cost-Effective**
    - Utilizes the Indus River's *natural sand deposition* instead of billion-dollar infrastructure.
    - Requires relatively low investment compared to massive dams.
2. **Quick Implementation**
    - Natural levees can be reinforced within *seasons*, not decades.
    - Vegetation, controlled sediment guidance, and small-scale engineering can be rolled out rapidly.
3. **Environmentally Friendly**
    - Works *with the river's natural dynamics* instead of altering them.
    - Preserves fish migration, biodiversity, and floodplain ecosystems.
4. **Community-Centric**
    - Protects villages and farmlands with localized solutions.
    - Encourages community participation in levee reinforcement, vegetation planting, and riverbank care.
5. **Sustainable & Adaptive**
    - Continuous replenishment of sand through natural flows makes it self-renewing.
    - Easier to maintain and adapt compared to rigid dam structures.

Using Thermal Technology to Locate Displaced People in Floods

In times of devastating floods, when communication lines are disrupted and visibility is poor, modern technology becomes a lifeline. **Thermal imaging technology**—mounted on drones, helicopters, or even handheld devices—can play a crucial role in **locating displaced people**. Unlike conventional cameras, thermal sensors detect body heat, making it possible to spot individuals stranded on rooftops, in waterlogged areas, or hidden under debris, even in darkness or heavy rain.

Section 4: Green Energy Champions

Dear students and supporters, many may think that the green energy transition is only the responsibility of governments, scientists, or big companies. But the truth is, **every one of us can play a role in this movement**—and in fact, young people and their families in Pakistan are already helping to lead the way! Pakistan has captured global attention with admiration. Despite being a developing country, **Pakistan has taken the lead in green energy transition by importing 17 gigawatts (GW) of solar panels in 2024**, alongside its local production. This remarkable achievement is made possible by the dedication of Climate Defenders like you.

Solar Energy Transition in Pakistan: A Grassroots Movement

Pakistan is blessed with sunlight almost all year round. In fact, our country has one of the **highest potentials for solar power** in the world. Imagine if every rooftop in our villages, towns, and cities was used to capture sunlight and turn it into clean electricity—Pakistan could reduce its dependence on costly fossil fuels, save foreign exchange, and provide affordable power for all.

This is not just a dream—it is already happening at the grassroots level:

- **Solar Rooftops in Villages and Cities**: Thousands of families, both in rural and urban areas, have started installing small solar panels on their rooftops. In villages, solar systems are bringing light to homes that were once in darkness after sunset. Children can now study at night, and small businesses can stay open longer.
- **Solar-Powered Schools**: Many schools across Pakistan, especially our Green Partner schools, are shifting to solar power. This not only reduces electricity bills but also provides a cleaner learning environment for students.
- **Community Solar Projects**: In some areas, families are pooling their resources to buy solar systems for shared use. These grassroots projects show the power of **working together for clean energy**.
- **Women and Solar Energy**: In many rural communities, women are using solar-powered sewing machines, fans, and water pumps, improving both their daily lives and family incomes.
- **Solar Water Pumps for Farmers**: Across Pakistan's villages, farmers are now installing **solar-powered water pumps and tube wells**. In areas where electricity is unreliable or unavailable, solar water pumps are becoming a lifeline. They help farmers irrigate their fields without depending on expensive diesel generators or irregular grid supply. As a result, barren lands are turning green, crops are growing

more reliably, and communities are achieving greater food security. For many families, this means not only better harvests but also more stable incomes and healthier diets.

These efforts, though small at first, are **building a national momentum**. Every solar panel installed at a home, school, farm, or shop adds to Pakistan's energy independence and climate resilience.

Role of Students and Families in Keeping the Pace

The transition to solar energy must grow faster, and **you—students and families—are the driving force.** Here's how:

1. **Awareness and Advocacy**
   Students can learn about the benefits of solar energy and explain them to their families, neighbours, and communities. Many families hesitate to install solar panels because they don't know how they work or think they are too expensive. By spreading awareness that solar panels are a **long-term investment** (saving money on bills for decades), students can change minds.

2. **Encouraging Neighbourhoods to Go Solar**
   Students can write petitions, run campaigns, or start eco-clubs to convince their neighbourhoods to adopt solar systems. A solar-powered community becomes a living example of sustainability.
3. **Supporting Family Choices**
   Families making the shift to solar need encouragement. Students can help by researching affordable solar options, identifying government programs, and even suggesting ways to save energy so that the solar system works efficiently.
4. **Community Leadership**
   Students can organize neighbourhood awareness drives, spreading the message that **solar energy is not just for the rich**—small, affordable solar kits are available that can power basic needs like lights and fans in homes.
5. **Strengthening Farming Families**
   For students from farming backgrounds, spreading knowledge about solar-powered tube wells and water pumps is a great way to support their communities. By convincing elders to consider solar irrigation, they can help make their villages greener and more productive.
6. **Innovating for the Future**
   Many Pakistani students are already working on science projects involving solar-powered cars, lamps, and water purifiers. By nurturing creativity, students can design new tools that make solar energy even more accessible for families.

Becoming Green Energy Champions of the World

Pakistan has the chance to become a global leader in the solar energy transition—and you, the young generation, are at the heart of it! Here's how you can grow into a **Green Energy Champion**:

- **Learn and Share Knowledge**: The more you learn about solar and renewable energy, the more you can inspire others.
- **Take Action Daily**: Save energy at home, encourage solar solutions, and practice habits that reduce wastage.
- **Start Local Projects**: Organize a "Solar Awareness Day" at school, help a neighbour explore solar options, or design small solar gadgets as science fair projects.
- **Think Big, Dream Big**: Imagine Pakistan where every school, hospital, farm, and home runs on clean energy. Imagine your community producing its own solar power instead of depending on fossil fuels.
- **Stay Committed**: Champions never stop. Even if progress feels slow, remember that every solar panel installed is a step closer to a cleaner, brighter Pakistan.

Green Energy – The Future of the World

The world is moving away from dirty fuels like coal and oil and shifting to **green energy**—energy that comes from natural, clean sources.

- **Solar Energy:** Using sunlight to make electricity.
- **Wind Energy:** Using wind turbines to generate power.
- **Hydropower:** Using river water to produce energy.
- **Biogas & Biomass:** Using waste and plants to create fuel.

Countries like Germany, China, and the UAE have invested billions in renewable energy. The goal is to have a world where homes, schools, cars, and even factories run on clean power instead of fossil fuels.

Saving Our Environment Locally

When we talk about Climate Change, the first thought that comes to mind is often "What can a student like me really do?" The truth is, you can do a lot. Let's look at some simple but powerful actions.

1. Planting and Protecting Trees

- Trees are our best friends in the fight against Climate Change.
- They absorb carbon dioxide and release oxygen.
- They provide shade, reduce heat, prevent soil erosion, and help control floods.

What you can do:

- Take part in tree plantation drives in your school or neighbourhood.
- Plant local species that grow well in your area, like neem, amaltas, or moringa.
- Protect existing trees—don't let anyone cut them unnecessarily.

Remember: "One student, one tree" could change the face of our cities.

2. Water Conservation

Water is life, and Pakistan is becoming a **water-stressed country**. Wasting water is like wasting life itself.

Tips for saving water:

- Turn off taps while brushing your teeth.
- Collect rainwater for watering plants.
- Report leaking taps or pipes in your home or school.
- Reuse water where possible, for example, using water from washing vegetables to water plants.

3. Managing Waste and Plastics

Plastic is choking our rivers, seas, and cities. Most plastics don't decompose and release harmful chemicals.

What you can do:

- Carry a reusable water bottle instead of buying plastic ones.
- Use cloth bags instead of plastic shopping bags.
- Recycle paper, glass, and metal wherever possible.
- Avoid littering—keep your classroom, school, and neighbourhood clean.

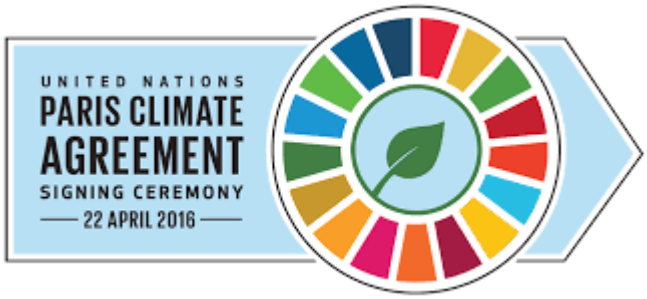
Remember: A clean Pakistan is a strong Pakistan.

Section 5: Climate Action

Dear students and supporters, by now you understand what Climate Change is, how it impacts our lives, and what we can do locally. But remember, Climate Change is a **global problem**. The greenhouse gases released in one country spread across the whole world's atmosphere. That is why all countries must work together to find solutions.

In this section, we will learn what the world is doing to fight Climate Change and how **Pakistan can play a leading role in the green energy transition.**

Global Agreements on Climate Action



Since Climate Change is a worldwide problem, countries meet regularly to discuss and agree on solutions. These meetings are called **climate conferences**.

- **The Paris Agreement (2015):** Almost every country in the world, including Pakistan, promised to reduce greenhouse gas emissions and try to keep global warming below 1.5°C.
- **COP (Conference of Parties):** Each year, world leaders, scientists, and activists meet to check progress and push for stronger action.

The main goals are:

1. Reduce pollution by cutting fossil fuel use.
2. Protect forests and plant more trees.
3. Develop clean, renewable energy like solar and wind.
4. Support poorer countries (like Pakistan) to cope with disasters.

Success Stories from Pakistan and Beyond

To give you hope, here are some real examples of sustainability in action:

1. **Urban Forests in Lahore and Karachi**
   - Using the Miyawaki method, small plots of land are being turned into dense mini-forests.
   - These forests cool the city, clean the air, and provide homes for birds.
2. **Solar Villages in Sindh**
   - Entire villages are now powered by solar energy,

reducing dependence on expensive fuels.

3. **Green Schools Projects**
    - Many schools in Pakistan, especially our Green Partners, are teaching students gardening, recycling, and clean energy skills.
4. **International Success**
    - In Costa Rica, nearly **100% of electricity** comes from renewable energy.
    - In Bhutan, the country absorbs more carbon than it produces, making it a "carbon-negative" nation.

These stories show that sustainability is not just a dream—it is happening right now. Pakistan can and should be part of this global success.

The Vision: Pakistan in 2050

Let's imagine together what a sustainable Pakistan could look like in the year 2050 if we all play our part:

- Cities full of green spaces, with clean air and safe water.
- Homes powered by solar energy, reducing electricity bills and pollution.
- Electric buses and trains transporting millions of people without smoke or noise.
- Farmers using smart irrigation, growing enough food for everyone.
- Students proud to live in a Pakistan that is seen as a **global climate leader.**

Final Message

Dear students and supporters, Climate Change is the greatest challenge of our time, but it is also the greatest opportunity. It challenges us to become more responsible, more united, and more creative. As Pakistanis, we have suffered from floods, heatwaves, and droughts, but we also have the courage, knowledge, and determination to build a better future.

Always remember: **You are not just students—you are Climate Defenders, future leaders, and builders of a sustainable Pakistan.**

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Glossary of Climate Change Terms

Adaptation: Adjusting our lives, homes, and farming to live with the effects of Climate Change. Example: building flood walls or planting drought-resistant crops.
Agriculture: The practice of growing crops and raising animals for food and income.
Biodiversity: The variety of living things—plants, animals, insects, and microorganisms—that live in an environment.
Carbon Dioxide – CO_2: A greenhouse gas released when we burn coal, oil, or gas. Too much CO_2 in the air causes global warming.
Climate: The long-term pattern of weather in an area (hot, cold, rainy, dry).
Climate Change: Long-term changes in temperature, rainfall, and weather patterns caused mostly by human activities.
Cloudburst: Very heavy rainfall in a short time, usually in mountainous areas, causing flash floods.
Deforestation: Cutting down forests without planting new trees.
Disaster Preparedness: Actions we take before a disaster to stay safe—like making emergency kits or drills in schools.
Drought: A long period without rain, causing water shortages and crop failures.
Ecosystem: A community of plants, animals, and their environment, all living and working together.
Emissions: Gases released into the air, usually from factories, vehicles, and burning fuels.
Fossil Fuels: Coal, oil, and gas formed from dead plants and animals millions of years ago. They produce pollution when burned.
Global Warming: The rise in Earth's average temperature due to more greenhouse gases in the atmosphere.
Green Energy: Clean energy from natural sources like sunlight, wind, and water that doesn't harm the environment.
Greenhouse Effect: The natural process that keeps Earth warm by trapping some of the sun's heat. Too much trapping causes overheating.
Heatwave: A period of very high temperatures lasting days or weeks.
Hydropower): Electricity made from flowing water, like dams and rivers.
Mitigation: Actions to reduce the causes of Climate Change, like using renewable energy or planting trees.
Monsoon: The rainy season in South Asia, especially between July and September in Pakistan.
Renewable Energy): Energy that comes from sources that never runs out, like the sun, wind, and water.
Resilience: The ability of people or communities to recover after a disaster.
Smog: Thick, dirty air caused by smoke and pollution, common in cities like Lahore during winter.
Sustainability): Living in a way that protects resources for future generations.
Urban Flooding: Flooding that happens in cities because drains are blocked or rains are too heavy.
Vulnerability: How exposed or at risk people or places are to the impacts of Climate Change.
Weather: The condition of the air and sky at a specific time and place (rainy today, sunny tomorrow).

Green Living Pakistan