

STRIVE TO BE LIMITLESS

HORIZON



OUR PLANET, OUR RESPONSIBILITY

JUNE EDITION

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EDITOR'S MESSAGE

Welcome to this issue of Horizon, where we explore the intricate and vital connection between our environment and the challenges posed by climate change. As we navigate through these critical topics, our aim is to inform, inspire, and ignite action.

In this edition, we delve into the health of our soil, the lifeblood of sustainable agriculture, and the significance of composting in reducing waste. We shed light on biodiversity hotspots and endangered species, emphasizing the importance of preserving our natural world.

Water scarcity and ocean health are pressing issues, demanding our attention and collective effort. We highlight innovative clean water initiatives that pave the way for a sustainable future. Air pollution and renewable energy take center stage, exploring the balance between urban development and environmental preservation.

As wildfires become more frequent, our section on fire management discusses strategies to mitigate their impact, alongside the potential of biomass energy as a renewable resource. We also celebrate local heroes—individuals and communities making significant strides in environmental conservation.

Together, let's be stewards of our planet, fostering a more sustainable and resilient future for all. We hope this issue inspires you to take part in the global effort to combat climate change.

Thank you for joining us on this journey.

SIDDHI SHASTRI

SOIL

SOIL HEALTH AND CONSERVATION

Soil health is fundamental to the vitality of ecosystems. It forms the foundation for plant growth, which supports a myriad of life forms, from insects and microorganisms to larger animals. Healthy soil is crucial for nutrient cycling, ensuring plants receive essential nutrients like nitrogen, phosphorus, and potassium. This nutrient cycling supports robust plant growth, which in turn sustains various life forms and maintains ecological balance.

In addition to its role in nutrient cycling, soil is vital for water retention. Soil rich in organic matter and with good structure retains water effectively, reducing runoff and erosion while maintaining hydration for plants. This water retention capability is essential for preventing soil degradation and ensuring the availability of water during dry periods. Soil also plays a significant role in carbon sequestration, acting as a major carbon sink that helps mitigate climate change by capturing carbon dioxide from the atmosphere. Furthermore, soil health contributes to biodiversity, hosting a wide array of microorganisms such as bacteria, fungi, and earthworms. These organisms enhance soil fertility and support plant health, ultimately contributing to the stability and resilience of ecosystems.

TECHNIQUES FOR SOIL CONSERVATION

Contour Plowing:

Involves plowing along the contour lines of a slope.

This technique reduces soil erosion by slowing water runoff and capturing soil.

Terracing:

Converts steep slopes into a series of flat steps.

Reduces runoff and prevents soil erosion, making farming on hillsides more sustainable.

Cover Crops:

Planting crops like clover, rye, or vetch during off-seasons.

These crops protect the soil from erosion, enhance soil structure, and add organic matter when they decompose.

Crop Rotation:

Alternating different types of crops in the same field across seasons. Prevents depletion of specific nutrients, reduces pest and disease cycles, and improves soil structure.

Agroforestry:

Integrating trees and shrubs into agricultural systems. Trees enhance biodiversity, improve soil fertility, and reduce erosion by stabilizing the soil.

No-till Farming:

Avoids plowing and turning the soil to maintain soil structure. Reduces erosion, preserves organic matter, and enhances soil moisture retention.

Mulching:


Applying a layer of organic material on the soil surface. Conserves soil moisture, regulates soil temperature, and adds nutrients as it decomposes.

Contour Bunding:

Constructing embankments along the contours of the land. Helps in capturing water and reducing soil erosion.

Windbreaks and Shelterbelts:

Planting rows of trees or shrubs to break the force of the wind. Protects soil from wind erosion and provides habitats for wildlife.



There are 12
times more trees
on Earth than
stars in the Milky
Way

**DID YOU
KNOW?**

SUSTAINABLE AGRICULTURE

Sustainable agriculture aims to meet the needs of current and future generations while minimizing environmental impact and ensuring economic viability. Several practices contribute to sustainable farming by promoting soil health and reducing degradation:

1. Integrated Pest Management (IPM):

IPM combines biological, cultural, and chemical methods to manage pests effectively while minimizing environmental impact. It involves techniques like crop rotation, biological control, and the targeted use of pesticides.

2. Organic Farming:

Organic farming avoids synthetic chemicals such as fertilizers and pesticides. Instead, it relies on natural methods like composting, crop rotation, and biological pest control to maintain soil health and fertility.

3. Cover Cropping:

Planting cover crops during fallow periods helps protect soil from erosion, improves soil structure, and adds organic matter. Cover crops like legumes also fix nitrogen in the soil, reducing the need for synthetic fertilizers.

4. Crop Rotation:

Alternating crops in a specific sequence on the same field helps break pest and disease cycles, improves soil fertility by diversifying nutrient demands, and enhances soil structure.

5. Conservation Tillage:

Practices like minimum tillage or no-till farming reduce soil disturbance, preserve soil structure, and increase organic matter content. This approach improves water infiltration, reduces erosion, and sequesters carbon in the soil.

6. Water Management:

Efficient irrigation techniques such as drip irrigation and precision farming minimize water use, reduce runoff, and enhance soil moisture retention. Proper drainage systems prevent waterlogging and soil degradation.

7. Soil Conservation Techniques:

Techniques like contour plowing, terracing, and strip cropping reduce soil erosion by controlling water flow and protecting soil from wind and water movement.

REDUCING SOIL DEGRADATION

To reduce soil degradation, sustainable agriculture emphasizes practices that maintain soil health and fertility over the long term. These practices include:

Improving Soil Organic Matter: Adding organic matter through composting, cover cropping, and crop residues enhances soil structure, nutrient availability, and water-holding capacity.

Avoiding Overuse of Chemical Fertilizers: Balancing nutrient inputs based on soil testing and using organic amendments to avoid nutrient imbalances and soil acidification.

Promoting Soil Biology: Encouraging beneficial microbial activity through practices like crop diversity, reduced tillage, and maintaining soil cover with cover crops or mulch.

Monitoring Soil Health: Regularly testing soil for nutrient levels, pH, and organic matter content helps farmers make informed decisions about nutrient management and soil conservation practices.

Education and Training: Providing farmers with training and resources on sustainable practices, soil conservation, and the importance of biodiversity in agricultural landscapes.

By adopting these sustainable farming practices, farmers can protect soil health, enhance crop productivity, and contribute to environmental conservation and resilience against climate change impacts.

COMPOSTING AND WASTE MANAGEMENT

Composting is a natural process that decomposes organic materials into a nutrient-rich soil amendment known as compost. It involves the breakdown of organic matter such as food scraps, yard trimmings, and paper into humus-like material through the activity of microorganisms, earthworms, and other decomposers. Composting is not only a sustainable way to manage organic waste but also contributes to soil health and fertility.

Effective waste management strategies encompass a range of practices aimed at minimizing waste generation, maximizing resource recovery, and reducing environmental impact. These strategies include recycling, composting, waste-to-energy technologies, and landfill diversion programs.

BENEFITS OF COMPOSTING

1. Soil Enrichment:

Compost improves soil structure by increasing organic matter content, enhancing nutrient retention, and promoting beneficial microbial activity. This improves plant growth and reduces the need for synthetic fertilizers.

2. Waste Reduction:

Composting diverts organic waste from landfills, where it would otherwise generate methane, a potent greenhouse gas. This helps reduce landfill volumes and associated environmental impacts.

3. Climate Change Mitigation:

By sequestering carbon in the soil, composting helps mitigate climate change. Organic matter in compost is stabilized, preventing its decomposition into methane and carbon dioxide, which would occur in anaerobic landfill conditions.

4. Nutrient Recycling:

Compost recycles nutrients like nitrogen, phosphorus, and potassium back into the soil, closing the nutrient loop and reducing dependency on synthetic fertilizers. This sustainable nutrient management supports long-term agricultural productivity.

5. Improvement of Soil Health:

Compost enhances soil structure, improves water retention, and reduces soil erosion. It encourages healthy root growth and increases soil biodiversity, fostering resilient and productive ecosystems.

6. Cost Savings:

Using compost reduces input costs for farmers and gardeners by replacing expensive synthetic fertilizers and improving overall soil health. It also reduces municipal waste management costs by diverting organic waste from expensive landfill disposal.

7. Community Benefits:

Community-scale composting initiatives promote local sustainability, educate residents about waste reduction, and create opportunities for community engagement and involvement in environmental stewardship.

8. Resource Conservation:

Composting conserves natural resources by reducing the need for virgin materials in soil amendments and fertilizers. It supports a circular economy where organic waste becomes a valuable resource for agriculture and landscaping.

By integrating composting into waste management strategies, communities and individuals can contribute significantly to environmental conservation, sustainable agriculture, and resilience against climate change while creating local economic opportunities and improving soil health.



**Bananas always
move upwards.**

**DID YOU
KNOW?**

ENDANGERED SPECIES: ON THE BRINK

Our planet is home to an astonishing array of life forms, each playing a vital role in maintaining the delicate balance of ecosystems. However, many species are currently teetering on the brink of extinction due to human activities such as habitat destruction, climate change, and poaching. Preserving these species isn't just about saving charismatic animals; it's about safeguarding biodiversity, which is crucial for our own well-being and the health of the planet.

Sumatran Orangutan (*Pongo abelii*):

Found only on the Indonesian island of Sumatra, habitat loss due to deforestation and palm oil plantations threatens their survival.

Amur Leopard (*Panthera pardus orientalis*):

Native to the temperate forests of Russia and China, the Amur leopard is critically endangered due to habitat loss, poaching, and prey depletion.

Vaquita (*Phocoena sinus*):

A small porpoise found in the Gulf of California, Mexico, the vaquita is critically endangered with only a few dozen individuals left due to bycatch in illegal fishing nets.

California Condor (*Gymnogyps californianus*):

North America's largest bird, the California condor faced extinction in the 1980s due to lead poisoning and habitat loss. Conservation efforts have helped increase their numbers, but they remain critically endangered.

Philippine Eagle (*Pithecophaga jefferyi*):

The national bird of the Philippines, the Philippine eagle is critically endangered due to habitat loss from deforestation and illegal hunting.

Humans are the
only animals that
sleep on their
backs.

**DID YOU
KNOW?**

Tortoise (*Astrochelys radiata*):

Found only in Madagascar, the radiated tortoise is critically endangered due to habitat destruction and illegal pet trade.

Yangtze Giant Softshell Turtle (*Rafetus swinhoei*):

Native to China and Vietnam, this turtle is critically endangered with possibly only three individuals left in the wild due to habitat loss, pollution, and hunting.

WHY DOES IT MATTER?

1. Ecosystem Stability:

Every species, no matter how small or seemingly insignificant, contributes to ecosystem stability. They regulate natural processes like pollination, seed dispersal, and nutrient cycling that are essential for maintaining healthy ecosystems.

2. Cultural Significance:

Many endangered species hold cultural and spiritual significance for indigenous communities around the world. They are part of our shared heritage and identity, offering profound connections to our past and traditions.

3. Economic Value:

Wildlife tourism, centered around endangered species like elephants, tigers, and whales, generates billions of dollars annually and supports local economies. Protecting these species means safeguarding livelihoods and economic opportunities for communities.

4. Scientific Discovery:

Endangered species often hold the keys to medical breakthroughs and technological innovations. Their unique biological adaptations offer insights into potential cures for diseases, advancements in materials science, and sustainable agricultural practices.

The skin of frogs
that throw poison
also contains
dangerous toxic.

**DID YOU
KNOW?**

WHAT CAN YOU DO?

1. Support Conservation Efforts:

Donate to reputable conservation organizations that work to protect endangered species and their habitats. Your contributions can fund research, anti-poaching efforts, and community education programs.

2. Choose Sustainable Products:

Make informed choices when purchasing products made from wildlife or natural resources. Avoid products derived from endangered species or illegally harvested timber and support sustainably sourced alternatives.

3. Spread Awareness:

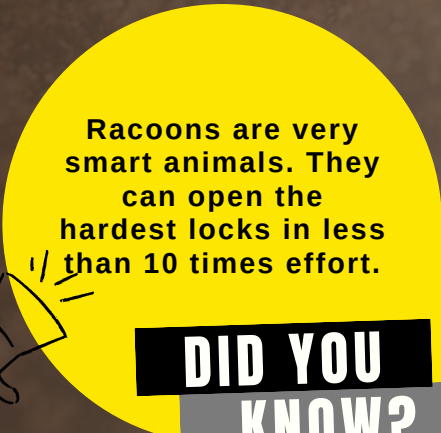
Share stories about endangered species and the importance of biodiversity with your friends, family, and social networks. Education and awareness are crucial in inspiring collective action and advocating for policy change.

4. Adopt Sustainable Practices:

Embrace a sustainable lifestyle by reducing your carbon footprint, conserving water, and minimizing waste. Small changes in daily habits, such as using reusable products and supporting local farmers, can make a significant difference.

5. Get Involved Locally:

Participate in community-based conservation initiatives, volunteer for wildlife monitoring programs, or engage in local habitat restoration efforts. Your active involvement can directly contribute to the preservation of endangered species in your region.



Racoons are very smart animals. They can open the hardest locks in less than 10 times effort.

**DID YOU
KNOW?**

SUSTAINABLE LIVING TIPS

Living sustainably isn't just a trend; it's a commitment to preserving our planet for future generations while enhancing our quality of life today. Here are some unique and practical tips to inspire you on your journey towards a greener lifestyle:

1. Embrace Plant-Based Eating:

Explore delicious plant-based recipes and reduce your consumption of animal products. Plant-based diets have a lower environmental impact and promote better health.

2. Go Zero Waste:

Aim to reduce waste by opting for reusable shopping bags, containers, and water bottles. Embrace composting and recycling to minimize your household's environmental footprint.

3. Support Local Farmers:

Buy locally grown produce and support farmers' markets in your community. By reducing the distance food travels to your plate, you decrease carbon emissions and support local economies.

4. Green Your Commute:

Walk, bike, or use public transportation whenever possible. Consider carpooling or investing in an electric vehicle to reduce air pollution and fossil fuel consumption.

5. Conserve Water:

Install water-efficient fixtures and appliances in your home. Practice mindful water use by fixing leaks, watering gardens in the early morning or late evening, and using rainwater harvesting systems.

6. Create Wildlife Habitat:

Plant native species in your garden to provide food and shelter for local wildlife. Create habitats such as bird feeders, bat boxes, or butterfly gardens to support biodiversity in your own backyard.

7. Energy Efficiency Matters:

Upgrade to energy-efficient appliances and LED lighting. Consider installing solar panels or using renewable energy sources to power your home.

8. Educate and Advocate:

Stay informed about environmental issues and advocate for policies that promote sustainability and protect natural habitats. Your voice and actions can influence positive change on local and global scales.

By incorporating these sustainable living tips into your daily routine, you not only reduce your ecological footprint but also inspire others to join the movement towards a healthier, more resilient planet for all species, endangered or thriving.

**Amazon rainforest
produces 20% of the
world's oxygen gas.**



**DID YOU
KNOW?**

INNOVATIVE SOLUTIONS FOR A GREENER FUTURE

As we face environmental challenges, innovative solutions are emerging that promise a more sustainable future. These groundbreaking ideas not only address pressing issues but also inspire hope and action.

Vertical Farming

Imagine urban skyscrapers filled with lush, thriving farms. Vertical farming uses stacked layers in controlled environments to grow crops year-round, using less water and space. This approach reduces transportation emissions and brings fresh produce to city dwellers, revolutionizing our food system.

Ocean Cleanup Technologies

Our oceans are drowning in plastic, but new technologies are turning the tide. Projects like The Ocean Cleanup use massive floating barriers to capture plastic debris, preventing it from harming marine life. These innovations are crucial in restoring the health of our oceans.

Solar-Powered Roads

Picture roads that harness solar energy as you drive. Solar roadways are being developed to generate clean electricity while supporting electric vehicles. This dual-purpose infrastructure could transform our transportation system, reducing reliance on fossil fuels.

Biofabrication

Fabrics grown from mushrooms and algae? Biofabrication creates sustainable materials that replace traditional textiles and plastics. These biodegradable alternatives reduce pollution and promote circular economies, paving the way for eco-friendly fashion and products.

Air-Cleaning Buildings

Buildings that breathe? New architectural designs incorporate materials and plants that absorb pollutants and improve air quality. These structures act as urban lungs, providing cleaner air and enhancing city life.

Renewable Energy Storage

Energy storage is a game-changer for renewables. Innovations like gravity batteries and flow batteries store solar and wind energy efficiently, ensuring a steady power supply even when the sun sets or the wind calms. This advancement is key to a sustainable energy future.

Algae Biofuels

Algae, a humble organism, holds the potential to replace fossil fuels. Algae biofuels produce more energy per acre than traditional crops and absorb CO₂ during growth. This green fuel could power vehicles and reduce greenhouse gas emissions significantly.

Smart Grids

Smart grids revolutionize how we consume energy. By integrating renewable sources and using real-time data, these grids optimize electricity distribution, reduce waste, and empower consumers to make informed energy choices.

Biodegradable Packaging

Goodbye, plastic waste! Biodegradable packaging made from materials like seaweed and cornstarch decomposes naturally, reducing landfill waste and pollution. These eco-friendly alternatives offer sustainable solutions for everyday products.

Wildlife Corridors

To combat habitat fragmentation, wildlife corridors connect isolated animal populations, allowing them to roam safely and maintain genetic diversity. These green pathways support biodiversity and resilience in ecosystems.

Strawberry and
Cashew are the 2
fruits, whose seeds
are outside.

**DID YOU
KNOW?**

BIODIVERSITY HOTSPOTS

Biodiversity hotspots are the planet's most biologically rich yet threatened areas. These regions are teeming with unique species found nowhere else, making them crucial for conservation.

What Makes a Hotspot?

High Endemism:

Hotspots contain a high number of endemic species, which means they exist only in that specific location. For example, Madagascar hosts over 11,000 endemic plant species!

Rich Ecosystems:

From lush rainforests to vibrant coral reefs, these ecosystems support diverse wildlife. The Amazon Rainforest alone is home to about 10% of the known species on Earth.

Why Are They Important?

Ecosystem Services:

Hotspots provide essential services such as water purification, carbon storage, and soil fertility. The forests of the Congo Basin, for instance, act as a massive carbon sink, helping regulate the global climate.

Medicinal Discoveries:

Many medicinal compounds are derived from plants and animals in these regions. The rosy periwinkle from Madagascar has been vital in treating childhood leukemia.

Cultural Significance:

Indigenous communities rely on these ecosystems for their livelihoods and cultural practices, deeply connecting their traditions with the natural world.

EXAMPLES OF BIODIVERSITY HOTSPOTS

The Amazon Rainforest:

Spanning several South American countries, it's known as the "lungs of the Earth." It houses jaguars, anacondas, and millions of insect species, many of which remain undiscovered.

The Coral Triangle:

Located in the Indo-Pacific, this marine hotspot has the highest coral diversity in the world, supporting species like the whale shark and green sea turtle. It's vital for marine biodiversity and local fishing communities.

The Cape Floristic Region:

Found in South Africa, it's the smallest and richest of the world's six floral kingdoms. Home to over 9,000 plant species, it's a botanist's paradise, with many plants used in traditional medicine.

EXAMPLES OF BIODIVERSITY HOTSPOTS

The Amazon Rainforest

The Amazon is often called the "lungs of the Earth," producing about 20% of the world's oxygen. This vast rainforest, spanning several South American countries, is home to millions of species, many yet to be discovered. Its dense canopy supports jaguars, sloths, and vibrant macaws, playing a crucial role in global climate regulation and carbon storage.

The Great Barrier Reef

The world's largest coral reef system, located off Australia's coast, is a dazzling underwater world. Home to thousands of marine species, it supports vital fishing and tourism industries. Coral reefs act as natural barriers, protecting coastlines from storms and erosion, while also hosting a plethora of organisms, from tiny clownfish to majestic sea turtles.

The Serengeti

This vast African savanna is renowned for the Great Migration, where millions of wildebeest and zebras traverse its plains. The Serengeti's grasslands support a diverse range of wildlife, including lions, elephants, and cheetahs. It's a living example of predator-prey dynamics and the importance of maintaining natural habitats for ecological balance.

Madagascar

An island nation rich in biodiversity, Madagascar is home to unique species like lemurs and baobab trees. Over 80% of its wildlife is found nowhere else on Earth. The island's diverse ecosystems, from rainforests to dry spiny forests, provide essential ecosystem services, including soil fertility and water regulation.

The Galápagos Islands

Famed for inspiring Charles Darwin's theory of evolution, the Galápagos is a living laboratory of unique species, such as marine iguanas and blue-footed boobies. These volcanic islands demonstrate the importance of isolation in species diversification, showcasing evolutionary processes in real-time.

The Arctic Tundra

This cold, treeless region is crucial for climate regulation, as it stores vast amounts of carbon in its permafrost. Home to polar bears, arctic foxes, and migratory birds, the tundra is a delicate ecosystem vulnerable to climate change. Its unique adaptations, like the insulating properties of snow, support life in extreme conditions.

IMPORTANCE OF UNIQUE ECOSYSTEMS

Biodiversity Reservoirs:

These ecosystems are hotspots of biodiversity, providing habitat for countless species and genetic diversity crucial for adaptation and resilience.

Ecosystem Services:

They offer services like pollination, water filtration, and carbon sequestration, essential for human survival and environmental health.

Cultural Significance:

Many ecosystems hold deep cultural and spiritual values for indigenous peoples, offering insights into sustainable living and conservation practices.

Scientific Research:

Unique ecosystems serve as natural laboratories for scientists, helping us understand ecological interactions, evolution, and the impacts of climate change.

The amount of tropical rain forest cut down each year is an area the size of Tennessee.



**DID YOU
KNOW?**

CLIMATE CHANGE: A GLOBAL CHALLENGE

Climate change represents one of the most significant and pressing challenges of our time. As the Earth's climate continues to warm, the consequences of human activities are becoming increasingly evident, impacting every aspect of our lives. This complex issue demands immediate and concerted efforts from all sectors of society to mitigate its effects and adapt to its inevitable changes.

THE CAUSES OF CLIMATE CHANGE

At the heart of climate change is the increase in greenhouse gases (GHGs) in the atmosphere. Carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) are the primary culprits, and their concentrations have risen dramatically due to human activities. The burning of fossil fuels for energy, deforestation for agriculture, and various industrial processes have significantly contributed to the accumulation of these gases.

When we burn fossil fuels like coal, oil, and natural gas, we release large amounts of CO₂ into the atmosphere. This gas, along with others, forms a 'blanket' that traps heat from the sun, leading to the greenhouse effect. While this effect is natural and necessary for life on Earth, human activities have enhanced it to dangerous levels.

ENVIRONMENTAL IMPACTS OF CLIMATE CHANGE

The consequences of climate change are widespread and profound, affecting natural systems and human societies alike.

Rising Temperatures: Since the late 19th century, the average global temperature has risen by approximately 1.1 degrees Celsius. This may seem like a small increase, but it has far-reaching effects. Heatwaves are becoming more frequent and intense, posing significant risks to human health, agriculture, and natural ecosystems.

Melting Ice and Rising Sea Levels: The polar ice caps and glaciers around the world are melting at unprecedented rates. This melting contributes to rising sea levels, which threaten coastal communities and ecosystems. Small island nations and low-lying areas are particularly vulnerable, facing the prospect of becoming uninhabitable.

Extreme Weather Events: Climate change is making extreme weather events more frequent and severe. Hurricanes, droughts, floods, and wildfires are becoming more common, causing widespread destruction and loss of life. These events strain emergency response systems and lead to significant economic losses.


Ocean Acidification: The world's oceans absorb a large portion of the CO₂ emitted into the atmosphere. This process, while helpful in slowing atmospheric warming, leads to ocean acidification. The increased acidity affects marine life, particularly organisms like coral reefs and shellfish that rely on calcium carbonate to form their shells and skeletons.

SOCIOECONOMIC IMPACTS

Climate change doesn't just impact the environment; it has profound socioeconomic consequences that affect millions of people around the globe.

Food Security: Changes in climate patterns, such as altered rainfall and increased temperatures, directly affect agricultural productivity. Crops may fail, and livestock may suffer, leading to food shortages and higher prices. This situation exacerbates hunger and malnutrition, especially in vulnerable communities.

Health Risks: The health impacts of climate change are numerous. Increased air pollution, heatwaves, and the spread of vector-borne diseases like malaria and dengue fever pose significant risks to human health. Additionally, extreme weather events can lead to injuries and loss of life.



Economic Disruption: The economic costs of climate change are staggering. Extreme weather events cause billions of dollars in damage to infrastructure, homes, and businesses. The costs of adapting to these changes, such as building resilient infrastructure and relocating communities, further strain economies, particularly in developing countries.

Displacement and Migration: As sea levels rise and extreme weather events become more frequent, people are forced to leave their homes. This displacement leads to migration issues, as individuals and families seek safer and more stable environments. The resulting social and economic pressures can lead to conflicts and further instability.

MITIGATION AND ADAPTATION STRATEGIES

Addressing climate change requires a multi-faceted approach that includes both mitigation and adaptation strategies.

Reducing GHG Emissions: Transitioning to renewable energy sources, such as wind, solar, and hydroelectric power, is crucial to reducing GHG emissions. Increasing energy efficiency in buildings, transportation, and industry also plays a significant role. Sustainable agricultural practices, such as reducing methane emissions from livestock and improving soil management, are also essential.

Carbon Sequestration: Enhancing natural carbon sinks, such as forests and wetlands, can help sequester atmospheric CO₂. Reforestation and afforestation projects, along with the restoration of degraded lands, are vital strategies. Additionally, developing technologies for carbon capture and storage (CCS) can help reduce CO₂ emissions from industrial sources.

Adaptation Measures: As some impacts of climate change are now unavoidable, adaptation measures are necessary. Building resilient infrastructure, such as flood defenses and climate-resilient buildings, is critical. Developing early warning systems for extreme weather events and adopting sustainable water management practices are also essential for adapting to changing conditions.

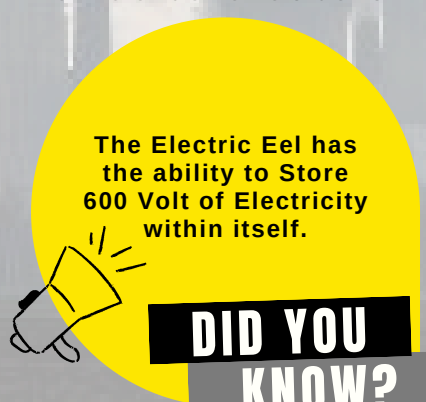
International Cooperation: Climate change is a global problem that requires global solutions. International agreements, such as the Paris Agreement, aim to unite countries in their efforts to combat climate change. Nations commit to reducing their GHG emissions through nationally determined contributions (NDCs) and providing financial support to developing countries to help them adapt and mitigate climate impacts.

THE ROLE OF INDIVIDUALS AND COMMUNITIES

While governments and businesses play a significant role in addressing climate change, individual actions and community initiatives are equally important. Simple changes in our daily lives can collectively make a big difference. Reducing energy consumption, using public transportation, recycling, and supporting sustainable products are all steps that contribute to the fight against climate change.

Communities can also take action by implementing local sustainability projects, such as community gardens, renewable energy cooperatives, and conservation programs. Education and awareness campaigns can help people understand the importance of climate action and inspire them to take meaningful steps.

Overall, climate change is an urgent and complex challenge that requires immediate and sustained action from all sectors of society. Its impacts on the environment and human life are profound, affecting everything from the food we eat to the air we breathe. By transitioning to a low-carbon economy, enhancing resilience to climate impacts, and fostering global cooperation, we can mitigate the effects of climate change and safeguard the planet for future generations. The time to act is now, and the responsibility lies with all of us to create a sustainable and equitable future.

A yellow circular graphic with a lightbulb icon. Inside the circle, the text reads: "The Electric Eel has the ability to Store 600 Volt of Electricity within itself." Below the circle, the text "DID YOU KNOW?" is written in a bold, black, sans-serif font.

The Electric Eel has
the ability to Store
600 Volt of Electricity
within itself.

**DID YOU
KNOW?**

AIR

Air is the source of all life on Earth. Animals need it for oxygen, plants need it for carbon dioxide. But what happens when this essential resource starts getting polluted? The very thing that life depends on is unhygienic and harmful?

Air pollution is the major cause of concern for human beings. Air pollution does not only happen because of human activities. It happens naturally as well. Volcanos, dust storms and wildfires are the most common causes of air pollution. Then there are the obvious causes of human activities such as vehicular emissions, industry processes and aircrafts in the sky. There are a wide range of chemicals released into the atmosphere due to these activities. Some of the most harmful chemicals are nitrogen oxides, sulfur oxides, carbon monoxide, and volatile organic compounds, which have detrimental effects on both human health and the environment. Air pollution causes respiratory disorders such as asthma, chronic obstructive pulmonary disease, heart attacks, allergies and even cancer. Children and senior citizens are the most susceptible to these chronic illnesses.

LET'S TALK ABOUT DELHI.

Delhi is the capital of India, and notorious for its air quality. The Air Quality Index (AQI) determines the quality of air in a particular region. A 0-100 range of air quality is considered normal or harmless and anything above 300 is considered hazardous. In such a metric, Delhi has recorded an AQI above 1000! Imagine the fatal environment for the people of Delhi.

There are multiple reasons for this situation in Delhi. One reason is its geography. Delhi is surrounded by Aravali Hills that do not let pollutants escape the city. Other than this, before the winters, the states of Punjab and Haryana conduct massive stubble burning that releases a large amount of pollutants in the air and these pollutants are brought to Delhi through the winds. During winters the temperature in Delhi goes down to almost 0 degrees. This is another factor for the air pollutants to settle low in the Delhi atmosphere. Also, Delhi has one of the highest vehicle density in the world. The vehicular emissions are one of the major causes for its pollution.

The government of Delhi has been coming up with multiple measures to control the air pollution of Delhi and safeguard the health of Delhi public. Graded Response Action Plan (GRAP) is one such measure that enforces strict rules and regulations on air pollution. But such situations still persist due to loopholes in the system that continue the allowance of polluting activities. According to WHO, 99% of the people in the world breathe air that exceeds WHO's air quality standards. Air pollution is responsible for almost 7 million premature deaths per year surpassing the combined fatalities from AIDS, tuberculosis and malaria.

RENEWABLE ENERGY

Renewable energy sources such as solar, wind, hydro, geothermal and biomass have proven to be extremely effective in tackling the issue of air pollution. Renewable energy sources produce much less to no pollutants as compared to fossil fuels, reducing the air pollution drastically. According to the International Renewable Energy Agency (IRENA), renewable energy could reduce global air pollution deaths by up to 80% and avoid 4-7 million premature deaths annually by 2050. This is an incredible step in improving our air quality and safeguarding people's lives. People must adapt such practices in order to have a sustainable life and have a better tomorrow for our future generations.

URBAN GREEN SPACES

Cities are a major source of air pollution. All the manufacturing and other economic activities majorly go on in the cities. Vehicular emissions are the majority from cities. A solution to these problems is having Urban Green Spaces. Urban green spaces like parks, gardens and tree-lined streets act as natural air filters. Plants are highly absorbent of pollutants such as carbon emissions from cars. Plants also give out oxygen and other organic compounds that can significantly improve the air quality.

Earth's atmosphere protects us from all sorts of space-borne hazards.



**DID YOU
KNOW?**

WILDFIRE

Wildfires were once considered a seasonal, localized and natural phenomenon. But this issue is now more frequent than ever and it is a global issue. These wildfires not only lead to loss of vegetation, but also cause global climate repercussions. It leads to loss of biodiversity, soil erosion and degradation of water resources. Wildfires release immense amounts of smoke that cause air pollution. Wildfires are caused by climate change, but after a wildfire, the climate change and global warming is further damaged as part of a vicious cycle. It is one of the leading causes for ecological imbalance.

Some of the most recent cases of wildfires are that of Australia in 2019-20. The Black Summer bushfires were caused due to multiple factors, one being climate change. Prolonged drought, heatwaves and low humidity created an ideal environment for a wildfire. Indian Ocean Dipole, a climatic phenomenon causes warmer sea surface temperatures in the western parts of the Indian Ocean. Several initial fires were ignited by lightning strikes. The wildfires in Australia spread across 18 million hectares, killing almost 3 billion animals and releasing 400 megatonnes of carbon dioxide.

Another case in California in 2020 where the wildfires spread over 4 million acres of land. This led to displacement of thousands of people and caused billions of dollars in damages. The cause of wildfires here too are drought and heat waves. The winds of Santa Ana also fanned the flames, contributing to the rapid spread of fires.

The ultimate culprits of these wildfires are climate change and human activities. Rising temperatures and heat waves led to drought and dried out vegetation. This is an ideal scenario for the spread of a wildfire. Human activities such as forest degradation, agricultural practices such as slash and burn, land clearing, arson, unattended campfires, power lines are all causes for the start of a wildfire.

LOCAL HEROES

The cause of these climate changes are people who devastate nature. But the cause of improvement are also the people who take initiatives to save our mother Earth. We share some of the most heroic stories of people who are actively participating in preservation of nature.

Tulsi Gowda: She is an environmental activist from Karnataka, a.k.a “Encyclopedia of Forest”. Gowda has planted thousands of trees and has dedicated her life to preserving the indigenous knowledge about plants and biodiversity. She was awarded the Padma Shri in 2020 for her valuable contributions for the betterment of the environment.

Jadav Payeng: He is known as the “Forest Man of India”. Payeng has single handedly created a 550 hectare forest on a barren land in Assam! This effort has provided a habitat for various wildlife species.

Lakshmi Menon: Menon is the founder of Pure Earth Foundation, an initiative to reduce pollution and promote sustainable waste management practices in rural communities of India. Her organization has provided clean drinking water, sanitation and waste treatment facilities to the rural areas.

Sneha Dharwadkar: She is a marine biologist in Maharashtra. Dharwadkar is leading a project to restore coral reefs along the Konkan coast. She grows coral fragments in nurseries and transplants them to damaged reefs.

Dharmendra Kumar: Kumar has dedicated his life to saving the Ganga River Dolphin, an endangered species in Bihar. His efforts have created awareness about the threats of extinction of these beautiful species and has promoted conservation initiatives.

Like these heroes, it is our duty too to take initiative and preserve the environment and its resources. There is no planet B, and we won't need one if we act quickly and judiciously. It is the responsibility of each and every person who believes that Earth is their home.

Owls are the only Birds that can see the Blue colour.



**DID YOU
KNOW?**

WATER

THE GROWING CRISIS

Water scarcity is a global issue affecting over two billion people. It's not just about arid regions; even water-rich areas face challenges due to overuse and pollution. With increasing demand and climate change, access to clean water is becoming critical.

Surprising Facts

Virtual Water:

Did you know that it takes about 3,000 liters of water to produce a single hamburger? This concept of "virtual water" highlights the hidden water costs in our food and products.

Rapid Depletion:

Aquifers, which provide drinking water for millions, are being depleted faster than they can replenish. The Ogallala Aquifer in the U.S. is a prime example, supplying 30% of the country's groundwater used for irrigation.

Melting Glaciers:

Glaciers, crucial freshwater sources for millions, are melting at unprecedented rates. The Himalayas, often called the "Third Pole," supply water to major rivers, supporting nearly two billion people.

Water scarcity is a pressing issue that requires global and local action. By adopting innovative solutions and making conscious choices, we can ensure a sustainable water future for generations to come. Every drop counts, and together, we can turn the tide on water scarcity.

The shrimp's blood does not have any colour, but when the blood comes in contact with the oxygen present in nature it converts into blue colour.



**DID YOU
KNOW?**

CHALLENGES OF WATER SCARCITY AND CONSERVATION METHODS

THE DIRE CHALLENGES

Water scarcity is more than a lack of water; it's a complex crisis with far-reaching impacts. It affects food production, health, and even geopolitical stability. Here's a closer look at some of the key challenges:

Population Growth: With the global population expected to reach 9.7 billion by 2050, demand for water will soar. Urbanization further strains water resources as cities expand.

Climate Change: Climate change exacerbates water scarcity by altering rainfall patterns, causing more frequent and severe droughts, and melting vital glaciers. The unpredictability of water availability poses a significant risk to communities worldwide.

Agricultural Demand: Agriculture accounts for about 70% of global freshwater use. Inefficient irrigation and water-intensive crops place enormous pressure on water supplies, especially in regions already experiencing scarcity.

Pollution: Industrial waste, agricultural runoff, and untreated sewage contaminate water sources, reducing the availability of clean water. In some areas, water pollution is so severe that even abundant water sources become unusable.

Economic Disparities: Wealthier nations can invest in advanced water technologies and infrastructure, while poorer regions struggle with basic water access. This disparity leads to unequal water distribution and exacerbates scarcity in vulnerable communities.

INNOVATIVE CONSERVATION METHODS

Addressing water scarcity requires creative and sustainable solutions. Here are some of the most promising conservation methods:

Desalination Technology: Desalination plants convert seawater into freshwater, offering a reliable source for coastal cities. Technological advances have made desalination more energy-efficient and cost-effective, making it a viable option for regions facing chronic water shortages.

Rainwater Harvesting: Collecting and storing rainwater for household and agricultural use can significantly reduce reliance on groundwater and municipal water supplies. Cities like Chennai, India, have successfully implemented rainwater harvesting systems to combat water scarcity.

Drip Irrigation: This method delivers water directly to plant roots through a network of tubes, reducing water waste by up to 60%. Drip irrigation not only conserves water but also increases crop yields, making it a win-win for farmers and the environment.

Greywater Recycling: Greywater systems reuse water from showers, sinks, and washing machines for irrigation and landscaping. By recycling greywater, households can cut water consumption by up to 50%, easing the burden on freshwater resources.

Smart Water Management: Advanced technologies like IoT sensors and AI can monitor water use in real-time, detect leaks, and optimize irrigation schedules. These smart systems help manage water resources more efficiently, preventing waste and ensuring sustainable usage.

Public Awareness Campaigns: Educating communities about the importance of water conservation and simple practices, like fixing leaks and using water-efficient fixtures, can lead to significant reductions in water use. Awareness campaigns empower individuals to take action and contribute to conservation efforts.

THE VITAL ROLE OF OCEANS

Oceans cover over 70% of our planet, playing a crucial role in regulating climate, producing oxygen, and supporting diverse ecosystems. They absorb about 30% of carbon dioxide emissions, mitigating climate change and providing a habitat for millions of species.

Fascinating Facts

Biodiversity Hotspot:

The oceans are home to over 80% of the world's biodiversity, from the tiny phytoplankton to the massive blue whale. Coral reefs, often called the "rainforests of the sea," support about 25% of all marine life.

Underwater Medicines:

Marine organisms are a source of unique compounds used in medicine. For instance, the sea sponge has provided cancer-fighting drugs, and algae are being researched for their potential in treating diseases.

Oxygen Production:

Phytoplankton, microscopic marine plants, produce more than 50% of the world's oxygen, highlighting the oceans' critical role in supporting life on Earth.

Threats to Ocean Health

Plastic Pollution:

An estimated 8 million metric tons of plastic enter the oceans each year, creating massive garbage patches and harming marine life. Sea turtles, seabirds, and fish often mistake plastic for food, leading to ingestion and entanglement.

Overfishing:

Unsustainable fishing practices deplete fish populations, disrupting marine ecosystems and threatening the livelihoods of millions who depend on fishing.

Climate Change:

Rising sea temperatures cause coral bleaching and disrupt marine life. Ocean acidification, a result of increased carbon dioxide absorption, weakens shellfish and coral reefs.

Habitat Destruction:

Coastal development and destructive fishing methods damage vital habitats like mangroves and seagrass beds, which serve as nurseries for many marine species.

Conservation Efforts

Marine Protected Areas (MPAs):

Establishing MPAs helps safeguard critical habitats, allowing ecosystems to recover and thrive. These areas boost biodiversity, replenish fish stocks, and protect endangered species.

Sustainable Fishing:

Promoting sustainable fishing practices, such as catch limits and selective gear, helps maintain fish populations and preserve marine ecosystems.

Plastic Reduction Initiatives:

Efforts to reduce plastic use, such as banning single-use plastics and promoting recycling, are crucial in combating ocean pollution.

Restoration Projects:

Coral reef and mangrove restoration projects are helping revive damaged ecosystems, improving coastal resilience and supporting marine biodiversity.

Ocean Cleanup Technologies:

Innovative solutions like floating barriers and drones are being deployed to remove plastic from the oceans, protecting marine life and restoring ocean health.

Oceans are the lifeblood of our planet, essential for climate regulation, oxygen production, and biodiversity. Protecting ocean health is vital for our well-being and the survival of countless marine species. By supporting conservation efforts, reducing plastic pollution, and promoting sustainable practices, we can ensure that our oceans remain vibrant and healthy for future generations. Let's dive in and be part of the solution!

THE CURRENT STATE

Our oceans are in crisis, facing threats from pollution, overfishing, and climate change. Plastic waste, estimated at 8 million metric tons annually, chokes marine life and creates vast garbage patches. Rising sea temperatures and acidification endanger coral reefs and disrupt ecosystems, while unsustainable fishing practices deplete fish populations, threatening biodiversity.

Clean Water Initiatives

Access to clean water is essential for health, agriculture, and sanitation. Innovative initiatives worldwide are making a significant impact:

Water Filtration Technologies

LifeStraw: This portable water filter removes bacteria and parasites, providing safe drinking water in remote areas.

Ceramic Water Filters: Low-cost and locally produced, these filters use porous clay to eliminate contaminants, making them ideal for developing regions.

Rainwater Harvesting

Collecting and storing rainwater for household and agricultural use reduces reliance on groundwater and helps communities manage water scarcity. Cities like Chennai have implemented large-scale rainwater harvesting systems.

Community-Based Programs

Water.org: Co-founded by Matt Damon, this organization provides microloans for building household water and sanitation solutions, empowering communities to improve their water access.

Clean Water Access Programs: Local initiatives focus on building wells, boreholes, and sanitation facilities, ensuring sustainable water supply and hygiene education.


Desalination Projects

Turning seawater into freshwater through desalination plants is a game-changer for coastal areas facing water scarcity. Advances in technology are making this process more energy-efficient and cost-effective.

Nature-Based Solutions

Restoring wetlands and forests helps purify water naturally. These ecosystems filter pollutants, manage stormwater, and replenish groundwater supplies.

Clean water initiatives are vital for sustainable development and public health. By supporting innovative technologies, community programs, and nature-based solutions, we can ensure access to clean water for all and protect this precious resource for future generations.



The closest living
relative to humans
are chimpanzees,
bonobos, and
gorillas.

**DID YOU
KNOW?**

PROJECTS AND TECHNOLOGIES ENSURING ACCESS TO CLEAN WATER

Access to clean water is critical for health, sanitation, and sustainable development. Across the globe, various projects and technologies are making significant strides in ensuring clean water access:

Solar-Powered Water Purification Systems:

Solar Water Disinfection (SODIS): Utilizes sunlight to kill pathogens in water stored in transparent containers, providing a simple and cost-effective method for communities without access to clean water sources.

Solar-powered Water Purifiers: Devices that use solar energy to purify water through filtration and UV disinfection, suitable for off-grid areas and emergency relief situations.

Water Purification Technologies:

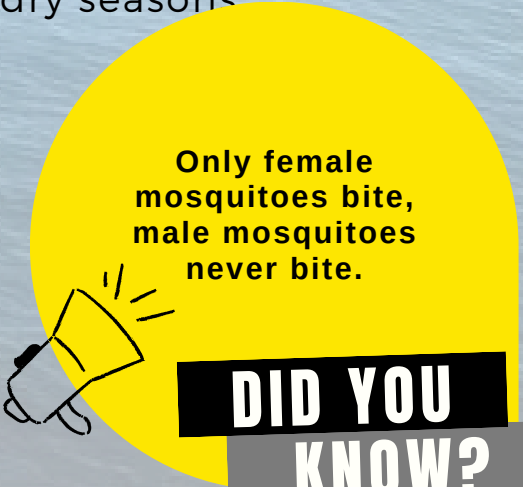
Reverse Osmosis (RO) Systems: Effective in removing contaminants from water, including salts, bacteria, and pollutants, making it suitable for both urban and rural settings.

Nano-filtration and Ultra-filtration: Advanced filtration technologies that remove particles and microorganisms from water, ensuring safe drinking water in diverse environments.

Gravity-fed Water Systems:

Gravity Water Filters: Simple filtration systems that use gravity to pass water through layers of filtration media, removing sediment, bacteria, and protozoa, ideal for households and small communities.

Community Water Tanks: Large-capacity tanks that collect and store rainwater or treated water for community use, ensuring continuous access to clean water during dry seasons.



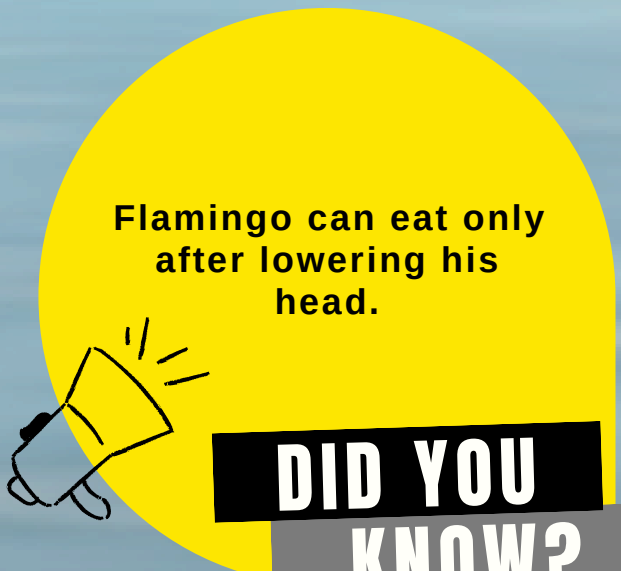
Only female
mosquitoes bite,
male mosquitoes
never bite.

**DID YOU
KNOW?**

Fog Harvesting: Nets or mesh structures placed in fog-prone areas to capture water droplets from fog, providing a sustainable water source for communities in arid regions where rainfall is scarce.

Mobile Water Treatment Units: Emergency Response Systems: Portable units equipped with water treatment technologies, deployed during humanitarian crises and natural disasters to provide safe drinking water quickly.

These projects and technologies demonstrate innovative approaches to ensuring clean water access globally. By combining technological advancements with community-based initiatives and sustainable practices, we can address water challenges effectively and improve the quality of life for millions of people around the world. Continued support and investment in clean water initiatives are crucial for achieving universal access to safe and clean drinking water.



Flamingo can eat only
after lowering his
head.

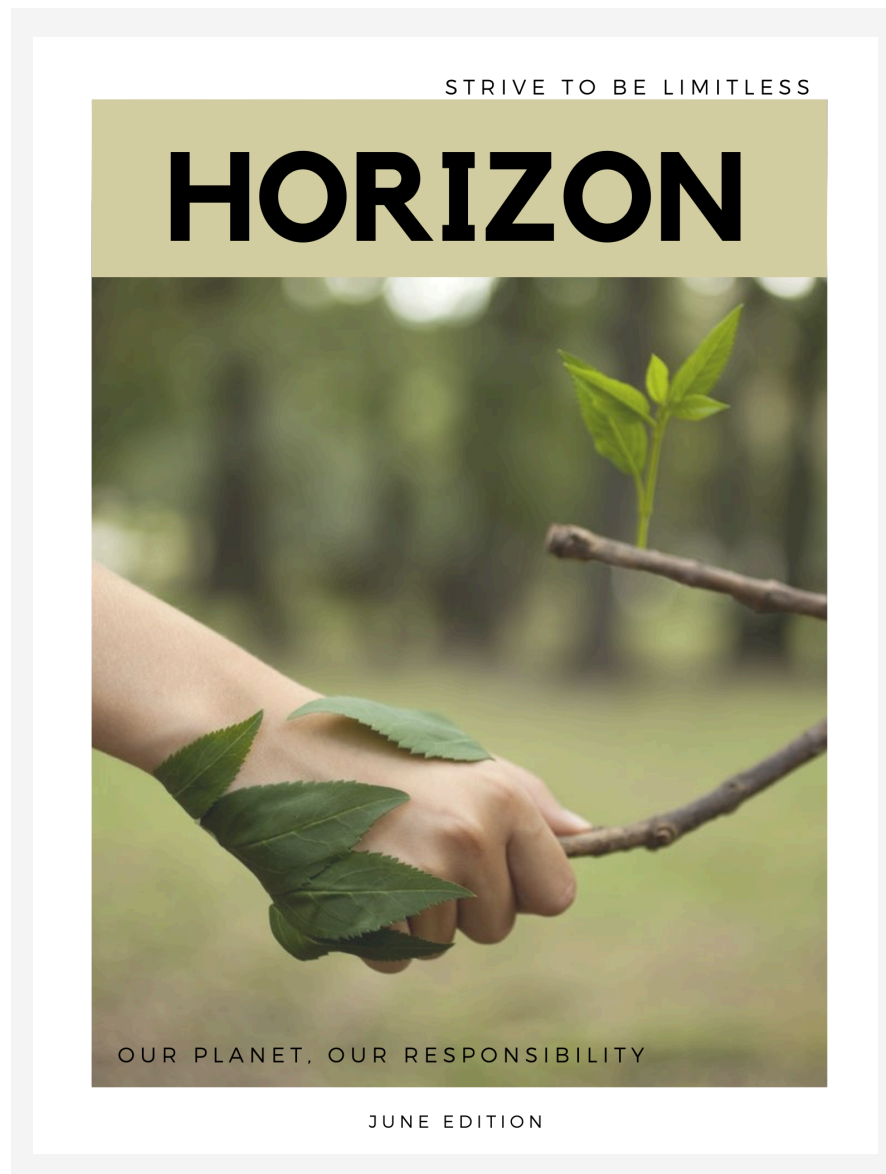
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