



HARIT SANKALP

हरित संकल्प

“अवसर की प्रतीक्षा में मत बैठो ।

आज का अवसर ही सर्वोत्तम है ।”

हर छोटा बदलाव बड़ी कामयाबी का हिस्सा होता है
मासिक न्यूज़लेटर | Monthly Newsletter

अक्टूबर 2025 | October 2025

विशेषांक : जलवायु परिवर्तन और हमारे प्रयास





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Message from the Editors
Harit Sankalp – Monthly E-Newsletter on Environment

Paryavaran (Environment) is a vast and multidimensional subject, encompassing both horizontal and vertical aspects. While most people relate to one or more parts of it, a deeper understanding reveals its true vastness and interconnectedness with every aspect of life.

The responsibility of protecting the environment does not rest solely with the Government, rather it is a shared duty of every individual. As one of the fastest-growing developing nations, our path demands strong economic and industrial growth. However, such progress must never come at the cost of environmental degradation.

In line with this vision, Paryavaran Sanrakshan Group has initiated “Harit Sankalp”, a monthly, environment-friendly E-Newsletter. This platform will bring together experts on core environmental issues from both national and international arenas, translating their knowledge into simple, practical insights for the common citizen.

Through this, we aim to bridge the gap between awareness and action, empowering every reader to contribute meaningfully to a sustainable future.

Dr. Pardeep Kumar, Dr. Suman Mor
Editorial Team, Harit Sankalp
E Mail: myharitpunjab@gmail.com

Environment and Nature in Buddhism: Bridging Dharma and Science for Sustainable Living



Dr. Devinder Pal Singh
Professor of Religious Studies, Arihanta Institute, San Jose, CA, USA
<https://www.arihantainstitute.org/faculty/20433-devinder-pal-singh-phd>

Abstract

The Buddha Dharma tradition offers a profound and holistic perspective on the environment, rooted in principles of interdependence, compassion, and non-violence. Central to Buddhist teachings is the concept of dependent origination, which reveals the interconnectedness of all life and underscores the ethical imperative to protect nature. Contrary to misconceptions that Buddhism is indifferent to worldly concerns or dismisses nature as illusory, the tradition emphasizes mindful living and respect for all sentient beings, supported by ancient scriptures such as the Dhammapada, Jataka tales, and Vinaya Pitaka. Modern ecological science echoes these insights through its understanding of ecosystems as interconnected networks, highlighting the relevance of Buddhist wisdom in contemporary environmental challenges. By integrating ancient ethical principles with scientific perspectives, Buddhism provides a compelling framework for sustainable stewardship and ecological mindfulness, encouraging compassionate action to safeguard the planet for present and future generations.

Introduction

The Buddha Dharma tradition, rooted in the teachings of Siddhartha Gautama, the Buddha, offers a profound and holistic approach toward the environment and nature. Far beyond simple religious rituals or ascetic withdrawal, Buddhism presents a worldview deeply intertwined with ecological awareness, respect for life, and understanding of natural interdependence [1-3]. This article explores authentic insights from Buddhist scriptures [4-8], addresses common misconceptions about nature, and reflects on how scientific understanding resonates with ancient Dharma wisdom.

Buddhist Perspectives on Nature: Interconnectedness and Compassion

One of the core Buddhist teachings that shapes its environmental ethos is dependent origination (pratītyasamutpāda), the understanding that all phenomena arise in dependence on

multiple causes and conditions. Nothing exists in isolation. This principle extends to all living beings and their environments, emphasizing the interconnectedness of life. The Pali Canon [6] repeatedly stresses this interdependence, such as in the Mahā Nidāna Sutta (DN 15), where the Buddha explains how suffering arises from interconnected causes and conditions.

This worldview nurtures a deep respect for nature because harming the environment is ultimately harming oneself and the entire web of life. Buddhism teaches compassion (karuṇā) for all sentient beings, encouraging non-violence (ahimsa) not only toward humans but also animals and plants. The Dhammapada [8] encapsulates this moral duty: “All tremble at violence; all fear death. Comparing others with oneself, one should not kill or cause to kill.” (Dhammapada 129)

Dispelling Myths and Misconceptions about Nature in Buddhism

Myth 1: Buddhism is indifferent to worldly affairs and nature.

Some perceive Buddhism as a purely renunciatory tradition, focused only on inner liberation and detached from worldly concerns. While personal enlightenment is central, the Buddha’s teachings emphasize ethical conduct that includes care for the environment. Buddhist monks traditionally live harmoniously with nature, often adhering to strict rules that prohibit harming plants and animals, demonstrating practical environmental ethics [2].

Myth 2: Nature is an illusion (Maya) and thus unimportant.

While Buddhism recognizes that all conditioned phenomena are impermanent and “empty” of independent self-nature, this philosophical insight does not mean nature is meaningless or to be destroyed. Instead, impermanence (anicca) highlights the need for mindful awareness and gratitude for nature’s transient beauty and resources. The ecological crisis demands a responsible and compassionate response, not neglect [3].

Environmental Ethics Rooted in Buddhist Texts

The *Jataka tales* [4], stories of the Buddha’s past lives, often feature narratives where he embodies virtues such as kindness to animals and care for forests. The *Vinaya Pitaka* [7], the monastic code, includes precepts that forbid monks from damaging plants unnecessarily or killing living creatures. These early Buddhist rules provide a framework for sustainability and ecological mindfulness.

The *Sutta Nipata* [9] and Five Precepts [10] also advise respect for the natural world: “Not to kill, not to steal, not to harm, these are the roots of virtue; by these the sage dwells in peace with all beings.”

Scientific Perspective and Buddhism: Convergence on Ecology

Modern ecological science [11-12] aligns remarkably with Buddhist insights on interdependence. Ecology reveals ecosystems as complex networks where species and environments co-evolve, mirroring Buddhist dependent origination. The concept of the biosphere as a living system underscores that disrupting one part can destabilize the whole.

Furthermore, Buddhism's emphasis on mindfulness [13] cultivates awareness of consumption habits, waste, and environmental impact, key elements in contemporary sustainability efforts. Research has shown that mindfulness practices foster pro-environmental behaviours, such as reduced carbon footprints and greater engagement in conservation.

Scientific understanding of impermanence through the lens of evolution and climate change also resonates with the Buddhist doctrine of change [14-15]. Recognizing the impermanence of ecosystems calls for urgent yet compassionate environmental stewardship.

Conclusion: Buddhism's Role in Modern Environmental Challenges

Buddha Dharma offers more than ancient spiritual wisdom; it provides a robust ethical and philosophical foundation for addressing today's environmental crises. Its principles of interdependence, compassion, non-violence, and mindful living create a framework for sustainable coexistence with nature.

Embracing this Dharma-inspired ecological consciousness can inspire both individuals and communities to cultivate respect for the environment and implement practical conservation efforts, bridging ancient wisdom with modern science for a healthier planet.

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Dr. Devinder Pal Singh, Ph.D., is a teacher-researcher and an author. He specializes in writing on science, religion and the environment. Currently, he is Professor of Religious Studies at Arihanta Institute, California, USA.

<https://www.arihantainstitute.org/faculty/20433-devinder-pal-singh-phd>

हरित संकल्प

From Forest to Balcony: Nature's Oxygen Factories



*Dr. Rajendra Singh, Senior Scientific Officer, Panjab University, Chandigarh
E mail: rajenderphysics@gmail.com*

When we think and talk about oxygen production in nature, normally we imagine about big and dense forests. But it may be complete in one sense but incomplete in many senses. We must need to know that how nature's small oxygen factories can flourish with the small spaces like corridor, balconies etc. We have to grow best possible number of plants at our home's empty spaces. This will not only increase oxygen levels around us, but bring natural beauty into our daily lives and make us active and healthy.

Plants are the Rich source of Oxygen

Plants release oxygen through photosynthesis, a process where they use sunlight, water, and carbon dioxide to produce glucose for energy and oxygen as a byproduct. Some plants, especially those with high leaf surface area or certain metabolic adaptations, are particularly effective in releasing oxygen and filtering indoor pollutants. So, we have to grow such plants in our balconies or empty spaces:

Oxygen Rich Plants for Our Balcony

- **Areca Palm** (Scientific name: *Dyopsis lutescens*): It is a top oxygen producing plant that removes indoor toxins like xylene and toluene etc. It blooms in bright, indirect sunlight with slightly moist soil. It has additional beauty in respective area, improves air quality, and will improve the atmosphere of our house
- **Money Plant (*Epipremnum aureum*)**: Money Plant is fast-growing creeper that purifies air by removing pollutants like formaldehyde and benzene etc. Grows well with enrich soil and water, needing minimal care and indirect sunlight. This species believed to bring positive energy in respective surroundings. In addition, it is perfect for balconies and indoor spaces.

- **Tulsi / Holy Basil (*Ocimum tenuiflorum*):** Tulsi is a sacred plant in Indian tradition that releases oxygen day and night while purifying the air. Rich in medicinal properties, it will boost our immunity and reduces stress. It gets flourishes in sunlight with regular watering, making it ideal for balconies and courtyards.
- **Snake Plant (*Sansevieria trifasciata*):** Snake plant is low maintenance plant that releases oxygen even at night through Crassulacean Acid Metabolism (CAM) photosynthesis. This plant is effective in removing indoor toxins like formaldehyde and benzene. In CAM photosynthesis, plants **open their stomata at night** (when it's cooler) to take in carbon dioxide. They store this CO₂ as malic acid in their cells. During the day, stomata stay closed to prevent water loss, and the stored CO₂ is used for photosynthesis, releasing oxygen. This is why CAM plants can release oxygen at night, unlike most plants that mainly release oxygen during the day. This plant will bloom in low to bright light with minimal watering, perfect for balconies and bedrooms.



Areca Palm

Money Plant

Tulsi

Snake Plant

Aloe Vera

Neem

Desi Tricks for growing plants in empty spaces at home

There are following tricks and suggestions, which can be taken care while caring and growing plants in our balcony or kitchen garden area:

- **Generate Khaad from Kitchen Waste:** Start habits of making khaad from vegetable peels, fruit skins, and leftover tea leaves into compost using a simple bucket composter. This will work as a organic nutrition to plants having low cost and labour.
- **Matka Watering Method:** For large pots, bury an unglazed clay pot (matka) filled with water near plant roots which releases moisture slowly, keeping soil hydrated for many days.
- **Neem Spray for Pests:** Boiled extract of neem leaves sprayed on garden plants weekly, will prevent and protect them from fungal and insect attacks naturally.
- **Coconut Husk Mulch:** Place coconut husk pieces over the soil surface of garden to retain moisture and reduce watering needs.
- **Banana Peel Boost:** Chop banana peels and bury them in the soil to provide potassium and phosphorus for healthy growth of plants in our nursery.

Benefits of growing plants in our Balcony or kitchen garden

Although, we are aware with the benefits of growing plants in our life, but still we have summarized some important points related to it:

- **Improved Air Quality:** Plantation and maintenance of maximum plants in our surrounding area in homes as well in offices bring higher oxygen levels, lower indoor CO₂, and remove harmful pollutants like formaldehyde and benzene etc.
- **Health & Wellness:** Small plants like Tulsi and Aloe Vera have medicinal uses, while green spaces will reduce stress and boost our mood happy.
- **Climate Contribution:** Every plant helps in carbon impounding, even at a micro-scale. So, we have to take care even a very small plant in our surroundings with full attention and care.
- **Biodiversity Support:** Green surroundings will attract birds, butterflies, and promote pollinators even in urban areas also. It will maintain our natural ecosystem in sustainable manner.

Cautions while Planting and Caring the plants

There are following points which must be taken care while planting and maintaining new and old plants in our surroundings:

- **Required Sunlight for right plant:** Most of plants prefer different dose of sunlight like direct or indirect as per their nature and strength, so we need to check each species' needs w.r.t. exposure of sunlight. Accordingly, we have to select place of plantation, face of plant etc.
- **Watering Wisely:** Overwatering kills many plants than underwatering. Please test and review the soil moisture before watering.
- **Repot Annually or half yearly:** Practice of refresh soiling and increase pot size must be practiced yearly, half yearly or quarterly as per requirement, to keep plants healthy and flowering.
- **Pruning:** Remove dry leaves and trim overgrowth to encourage fresh, oxygen-producing foliage. Use proper tool for pruning and get expert training to do same.
- **Seasonal Care:** Mostly, in winter need low watering in caparison to summer. Normally, watering in the early morning or evening will be preferred to prevent root shock.

Conclusion

We do not need acres of forest to help the planet breathe better, but our balcony or kitchen garden, can be a mini oxygen powerhouse. With a few well-chosen plants, some desi care techniques, and regular maintenance, we can enjoy cleaner air, better health, and the satisfaction of being part of nature's life-giving cycle.

“Every leaf, fruit, and herb in a kitchen garden is a whisper from nature to live well.”

THE ROLE OF HIGHER EDUCATIONAL INSTITUTIONS FOR THE CARING OF NATURAL ENVIRONMENT



Surinder Kumar, Head, Department of Geography, P.G. Govt. College for Girls, Sector-42, Chandigarh 160036, Email Id.: kumarsurinder182@gmail.com

INTRODUCTION

The environment encompassing natural elements such as the atmosphere, hydrosphere, lithosphere, biosphere and human-made surroundings, is the foundation of human survival and development. Yet, rapid urbanization, industrial growth, population explosion and unsustainable exploitation of resources have caused climate change, biodiversity loss, pollution and ecological imbalance. Addressing these issues requires more than policies and technology, it demands strong educational interventions. Higher Educational Institutions (HEIs) play a vital role by shaping environmentally conscious leaders, scientists, policy-makers and citizens. Through integrating sustainability into teaching, research, campus practices and community outreach, HEIs can foster awareness, encourage responsible resource use and act as custodians of the natural environment, ensuring that environmental guardianship becomes central to future societal progress. Caring of natural environment is possible by the implementation of following ways:

A. Integrating Environmental Education into Curricula

Higher Educational Institutions (HEIs) have the power to inculcate awareness and knowledge about environmental issues through academic curricula, like:

1. Environment Studies should be mandatory: Many universities now introduce Environmental science as a compulsory course for all students, regardless of discipline.

2. To Follow Interdisciplinary Approach: Engineering, management, social sciences, and humanities programs can integrate environmental concerns, ensuring holistic awareness.
3. To Promote Skill Development: Courses on renewable energy, waste management, sustainable agriculture and green technology equip students with practical skills to solve real-world problems.

B. To Promoting Research and Innovation

Universities, colleges and other research institutions are hubs of innovation, making them crucial in developing eco-friendly solutions through:

1. Sustainable Technology: Research in renewable energy, pollution control and Eco-friendly materials reduce human impact on nature.
2. Climate Change Studies: Universities/ Institutions can study local ecosystems, climate vulnerabilities and adaptation strategies.
3. Policy - Oriented Research: Higher Educational Institutions (HEIs) contribute to government policy making through research on environmental law, conservation and sustainable development.

C. Green Campus Initiatives

Higher Educational Institutions can lead by example by transforming their campuses into models of sustainability through the adoption of the following practices:

1. Energy Conservation: Installation of Solar Panels, use of LED lighting and development of energy-efficient buildings help reduce the campus carbon footprint.
2. Water Management: Practices such as rainwater harvesting, wastewater recycling and minimizing water wastage promote sustainable use of resources.
3. Waste Reduction: Adopting zero-plastic policies, establishing recycling programs and setting up composting units reduce environmental harm.
4. Biodiversity Conservation: Creating botanical gardens, carrying out tree

plantations and protecting green spaces on campus support local biodiversity and ecosystems.

D. Building Environmental Values and Ethics

Beyond academics, universities and educational institutions are responsible for shaping students values and ethical outlook by implementing the following initiatives.

1. Environmental Clubs and Societies: These foster participation in tree plantation drives, clean-up campaigns and awareness events.
2. Volunteerism and Social Responsibility: Students can engage in community service projects focused on conserving natural resources.
3. Eco-Ethics in Leadership: Higher Educational Institutions (HEIs) can inspire future leaders to prioritize environmental sustainability in professional and personal life.

E. Community Outreach and Partnerships

Higher Educational Institutions can extend their influence beyond campus boundaries through the initiatives of:

1. Awareness Campaigns: Universities/Educational institutions can organize workshops, exhibitions and street plays etc. on environment-friendly practices.
2. Rural Engagement: Students and faculty can work with rural communities to promote sustainable farming, afforestation and waste management.
3. Industry Partnerships: Collaborations with industries for cleaner technologies and Corporate Social Responsibility (CSR) projects amplify the impact.

F. Policy Advocacy and Leadership

As centers of knowledge, Higher Educational Institutions (HEIs) hold credibility in influencing policies like:

1. **Advisory Roles:** Faculty and experts from universities can contribute to drafting national and international environmental policies.
2. **Think Tanks:** Many institutions establish sustainability cells or think tanks that publish reports on pressing ecological issues.
3. **Global Engagements:** Through collaborations with global universities, institutions and organizations, Higher Educational Institutions can promote sustainable practices on an international level.

G. Encouraging Sustainable Lifestyles among Students

Students are future leaders and decision-makers, making it essential to cultivate eco-friendly lifestyles during their education; Higher Educational Institutions can promote sustainability on campus by promoting:

1. Cycling, public transport and carpooling on campus.
2. Reducing food waste in hostel messes/canteens and encouraging plant-based diets.
3. Creating awareness about responsible consumption and mindful use of resources.

Such initiatives instill lifelong environmentally conscious habits and empower students to make sustainable choices beyond campus life.

Conclusion

Higher Educational Institutions are not just centers of knowledge but also guardians of societal values and future directions. By embedding environmental consciousness in education, research, campus operations and community engagement, they can lead the way in addressing ecological challenges. Their role is both transformative and indispensable in nurturing environmentally responsible citizens and in shaping a sustainable future for humanity.

Reduce the Use of Plastic Bags and Always Carry a Cloth Bag



Dr N D Sharma Devshali , IPRO (Punjab Government)

Today, human life is advancing at a rapid pace, but in this race for progress, we are continuously harming our Earth and the environment. Challenges like pollution, climate change, and depletion of natural resources are confronting us. One of the main reasons behind these issues is the excessive use of plastic. While plastic is cheap, lightweight, and convenient, its consequences are extremely severe.

Plastic bags (polythene bags) used in daily life are at the root of this problem. They are used in such large quantities that every year, millions of tons of plastic waste spread across the Earth, rivers, and oceans, affecting not only nature but also humans and wildlife.

Dangerous Effects of Plastic Bags:

1. Non-biodegradability

Plastic bags remain in nature for 500 to 1000 years. This reduces soil fertility and contaminates water sources.

2. Harmful to wildlife and animals

Animals like cows, goats, dogs, and others often eat plastic while searching for food. It forms blockages in their stomachs, leading to painful deaths. Marine life is also severely affected by plastic waste.

3. Impact on human health

Burning plastic releases toxic gases such as dioxins, furans, and methane. These gases can cause respiratory diseases, cancer, hormonal imbalances, and skin disorders.

4. Contribution to climate change

Plastic production and disposal increase greenhouse gases in the atmosphere, which contributes to global warming and climate imbalance.

Cloth Bags: Simple Solution, Big Change:

Cloth bags (made of jute, cotton, or canvas) are not only durable but also beneficial for the environment and human health.

Reusable – One bag can be used for many years.

Can carry heavy loads – Cloth bags are strong and do not tear easily.

Environmentally friendly – Cloth bags are biodegradable and decompose easily in soil.

Economical – No need to buy plastic bags repeatedly; one bag lasts a long time.

Supports local artisans – Cloth and jute bags are made locally, promoting small-scale industries.

Social Responsibility and Awareness:

Individual level change – If every person carries a cloth bag while shopping, millions of tons of plastic waste can be avoided.

Campaigns in educational institutions – Schools and colleges can distribute cloth bags to students and run awareness campaigns.

Role of markets and shopkeepers – Shopkeepers should encourage customers to use cloth or jute bags.

Government initiatives – Many states have banned polythene bags, but strict enforcement and providing alternatives are necessary.

Our Earth is a shared heritage. If we do not reduce our dependence on plastic today, future generations will be deprived of clean air, safe water, and fertile soil.

“Say No to Plastic, Use a Cloth Bag” is not just a slogan but a mantra for saving life.

Small changes, like carrying a cloth bag, avoiding plastic bottles, and using reusable items, can lead us toward a healthier and cleaner future.

Let's take a pledge today – use a cloth bag with every shopping trip and play an active role in protecting our environment.

India's Mobile Boom and the E-Waste Challenge



Dr. Pardeep Kumar, Paryavaran Sanrakshan Gatividhi, Punjab.
Email Id: sharmaashupk@gmail.com

In recent years, India has emerged as a global leader in mobile manufacturing and consumer electronics. Today, India stands proudly as the world's second-largest producer of mobile handsets. Alongside this achievement, the nation has also risen to become one of the top four economies worldwide. These milestones reflect India's rapid progress in technology, industry, and market demand. However, with growth comes new challenges, most notably the environmental crisis posed by electronic waste, or e-waste.



India produced about 3.8 million metric tonnes of e-waste in FY24, and this amount is expected to keep increasing. Most of this waste is still handled by the informal sector, which can harm both people and the environment. To tackle this problem, the government has introduced E-Waste (Management) Rules and offers incentives for recycling batteries and critical minerals, aiming to create a cleaner, circular economy.

The Rise of Consumer Electronics in India:

The Indian market is currently flooded with electronic gadgets of every variety. From smartphones and laptops to desktop terminals, smart televisions, tablets, electronic toys and wearable devices, there has been a steady surge in both production and consumption. The average Indian consumer

today has more disposable income and stronger purchasing power compared to earlier decades. With improved financial capacity and aspirations for a better lifestyle, Indians are upgrading their gadgets at a faster pace than ever before.

A few years ago, changing a mobile phone once every three to four years was common. Today, many consumers opt to replace their devices annually or biennially to keep up with the latest technology, improved camera quality, faster processors, and enhanced features. Similarly, laptops and personal computers are being updated more frequently in homes, offices, and institutions. This consumer behavior reflects both India's technological appetite and its economic confidence.

Boost to the Indian Economy:

There is no doubt that this consumer electronics revolution has given a major boost to India's economy. Increased production means more job opportunities, stronger industrial growth, and rising exports. Manufacturing hubs in states such as Uttar Pradesh, Tamil Nadu, and Andhra Pradesh have attracted global investments from multinational corporations eager to set up production bases in India. This trend supports the government's vision of Make in India and strengthens India's global footprint in technology manufacturing.

Additionally, the growing appetite for electronic gadgets stimulates retail markets, e-commerce platforms, and service industries. For small businesses, vendors, and repair shops, the electronics boom has created countless opportunities. This growth contributes directly to India's GDP and enhances the nation's position as a technological powerhouse.

The Dark Side: E-Waste Explosion:

But while the economic picture looks bright, there is a darker side to this progress. The massive rise in electronic consumption has brought with it an equally massive rise in electronic waste. According to recent reports, India generates millions of tons of e-waste every year. Old and discarded mobile phones, broken laptops, outdated desktops, chargers, earphones, batteries, and other gadgets pile up in landfills or lie unused in homes.

Unlike traditional waste, e-waste poses severe environmental hazards. Electronics contain toxic substances such as lead, mercury, cadmium, and brominated flame retardants. If not disposed of properly, these materials can leach into soil and groundwater, contaminating ecosystems and endangering human health. Open burning or crude recycling of e-waste releases harmful fumes, worsening air pollution and posing risks to workers in the informal recycling sector.

Unfortunately, India still lacks robust systems for the systematic collection, recycling, and safe disposal of e-waste. A significant portion of discarded electronics ends up in informal markets, where untrained workers dismantle devices by hand, often without safety measures. This not only harms the environment but also exposes people to dangerous chemicals.

The Need for Responsible Consumption: The time has come to recognize that unplanned consumption can be as harmful as under-consumption. While it is natural to desire the latest technology, consumers must be aware of the consequences of frequent upgrades. Keeping gadgets for longer durations, repairing instead of replacing, and opting for refurbished devices can make a big difference in reducing e-waste.

Educational institutions, corporations, and government departments must also take responsibility. Bulk purchases and frequent replacements of devices add significantly to the overall e-waste burden. Policies encouraging responsible purchasing, extended warranties, and proper recycling should be implemented at organizational levels.

Use 4R Principle: Reduce, Reuse, Repair and Recycle

Experts suggest that the solution to India's e-waste crisis lies in the well-known principle of 4R: Reduce, Reuse, Repair and Recycle.

1.Reduce: Consumers must consciously reduce unnecessary purchases. This does not mean compromising on technology, but rather being mindful of how often gadgets are replaced. By extending the life of devices and resisting the urge for frequent upgrades, we can reduce the sheer volume of waste generated.

2. Reuse: Many devices that are discarded still function well or can be repaired. Donating old gadgets to schools, NGOs, or underprivileged communities can extend their lifespan and reduce waste. Reuse also includes purchasing refurbished devices, which are often as good as new but significantly cheaper and environmentally friendly.

3. Repair of Electronic Gadgets: Electronic gadgets such as mobile phones, laptops, tablets, televisions, and home appliances often stop working due to minor faults like damaged screens, faulty charging ports, weak batteries, or malfunctioning circuit boards. Instead of discarding them, repairing these devices can significantly extend their lifespan.

Repairs may include screen replacement, battery change, motherboard or PCB repair, power supply fixing, and software troubleshooting. By opting for repair, users not only save money but also

reduce the growing burden of e-waste on the environment. Encouraging repair culture makes technology more affordable and sustainable for all.

4.. Recycle: Safe recycling is the backbone of waste management. India needs more formal recycling plants equipped with modern technology to extract valuable metals like gold, copper, and silver from discarded electronics. Recycling not only prevents environmental damage but also recovers precious resources that can be reused in manufacturing.

Government Policies and Industry Responsibility

The Government of India has already taken some steps to address this issue. The E-Waste (Management) Rules encourage producers to adopt extended producer responsibility (EPR), making them accountable for collecting and recycling discarded products. Initiatives promoting sustainable manufacturing, environmentally friendly packaging, and take-back policies are slowly gaining momentum.

However, more needs to be done. Large corporations must invest in eco-friendly production and recycling processes. Tech giants, both Indian and multinational, must take the lead in creating awareness among consumers and setting up reliable collection centers for e-waste. Public-private partnerships can play a critical role in strengthening recycling infrastructure.

The Road Ahead

India is at a crossroads. On one hand, it has the opportunity to shine as a global leader in electronics and technology manufacturing. On the other, it faces the urgent challenge of managing the mountains of waste that come with it. The balance between economic growth and environmental sustainability is delicate, but achievable with the right mindset and policies.

As citizens, consumers, and stakeholders in this economy, we must embrace responsible habits. Every individual can contribute by holding onto devices longer, avoiding impulsive purchases, and ensuring proper disposal of outdated gadgets. Educational campaigns, government initiatives, and industry collaboration will be key to changing mindsets and practices.

Conclusion

India's rise as a mobile manufacturing hub and its position among the world's top economies is a matter of pride. The growing availability of consumer electronics reflects the aspirations of a nation on the move. Yet, behind this success story lies a mounting environmental concern that cannot be ignored.

The e-waste challenge is real, and its impact is long-term. By adopting the 4R principle of Reduce, Reuse, Repair and Recycle, we can chart a sustainable path forward. Responsible consumption, combined with strong government policies and industry action, will ensure that India's progress in technology does not come at the cost of its environment. If managed wisely, India can not only lead the world in production and consumption of electronics but also set an example in sustainable waste management.

हरित संकल्प

Clean Energy: The Foundation of a Sustainable Future



*Dr. Gurpreet Kaur, Head of Sciences & PGT Chemistry, Gobindgarh Public School, Mandi Gobindgarh
Email address: gurpreet7016@gmail.com*

Introduction

Energy powers the modern world. From running industries and fueling transportation to lighting our homes and driving digital technology, energy is central to human progress. For more than a century, fossil fuels—coal, oil, and natural gas—have been the backbone of global energy supply. While these sources have supported industrial growth and economic development, they also come with a heavy cost: pollution, global warming, and resource depletion.

The challenge of the present century is clear: meeting the rising demand for energy without endangering the planet. **Clean energy**, generated from renewable and eco-friendly sources, has emerged as the key to solving this crisis. By reducing dependence on polluting fuels, clean energy offers humanity a path toward sustainability, resilience, and prosperity.

Understanding Clean Energy

Clean energy refers to energy produced in ways that have minimal or no negative impact on the environment. It is generally derived from renewable sources that are naturally replenished and abundant. Major forms include:

- **Solar power**, which captures sunlight to generate electricity.
- **Wind power**, which converts the motion of air currents into usable energy.
- **Hydropower**, which utilizes moving water to produce electricity.
- **Geothermal energy**, which draws heat from within the Earth.

- **Biomass**, which turns organic material into usable fuel.

Unlike fossil fuels, which release harmful greenhouse gases, clean energy sources are sustainable and reduce the burden on ecosystems.

Why Clean Energy Matters

1. **Preserving the Environment:** Energy generation is the single largest contributor to greenhouse gas emissions. The International Energy Agency reports that around three-quarters of global CO₂ emissions come from energy production. Transitioning to renewables helps reduce carbon footprints and slows the pace of climate change.
2. **Ensuring Energy Security:** Many nations heavily depend on imported oil and gas, leaving them vulnerable to price hikes and political instability. Clean energy allows countries to harness domestic natural resources, ensuring reliable and independent energy supply.
3. **Boosting the Economy:** Renewable energy is not only environmentally friendly but also economically beneficial. The industry creates millions of jobs in fields such as research, technology, manufacturing, and installation. According to the International Renewable Energy Agency (IRENA), renewable energy employed more than 13 million people worldwide in 2021, and this number continues to grow.
4. **Guaranteeing Long-Term Sustainability:** Fossil fuels are limited, but sunlight, wind, and water are endless. Investing in clean energy ensures that future generations will have access to resources without exhausting the Earth's reserves.

Varieties of Clean Energy

1. **Solar Energy:** One of the most accessible forms of renewable energy, solar power uses photovoltaic panels or solar thermal systems. Countries like India and China are global leaders, with large-scale projects such as India's *Pavagada Solar Park*.
2. **Wind Energy:** Wind turbines convert wind into electricity, and both onshore and offshore wind farms are expanding worldwide. Denmark and Germany are global pioneers, deriving a major share of their power from wind.

3. **Hydropower:** Hydropower has been used for decades and remains the largest source of renewable energy worldwide. However, large dams must be managed carefully to protect ecosystems and communities.
4. **Geothermal Energy:** By tapping into heat beneath the Earth's surface, geothermal plants provide stable and reliable power. Iceland is a prime example, meeting most of its energy needs through geothermal and hydropower.
5. **Biomass Energy:** Organic materials like agricultural waste, wood, and even municipal garbage can be converted into electricity or fuel. While biomass still produces emissions, it is considered renewable because it recycles carbon already in the environment.

The Global Push for Clean Energy

Nations across the globe are accelerating the shift to clean energy:

- **China** dominates renewable energy investment, especially in solar and wind.
- **India** has emerged as a leader in solar power, with ambitious programs under the *National Solar Mission*.
- **European Union countries** have pledged to reach net-zero emissions by 2050, with Germany and Denmark at the forefront.
- **The United States** has significantly expanded its wind and solar capacity, particularly in states like Texas and California.

The **Paris Climate Agreement (2015)** further highlights the urgency of transitioning to clean energy as a way to curb global warming.

Obstacles to Clean Energy Transition

1. **High Initial Costs:** Renewable projects require significant upfront investments in technology and infrastructure. While they pay off in the long run, the initial financial burden can deter adoption.
2. **Intermittency Issues:** Solar and wind energy are weather-dependent. Cloudy skies, calm winds, or seasonal variations can cause fluctuations in supply.
3. **Land and Ecosystem Impact:** Solar farms, wind parks, and hydropower dams occupy large areas of land and can affect biodiversity or displace communities.
4. **Technological Limitations:** Developing nations often lack the advanced technology or skilled workforce necessary for large-scale renewable deployment.

5. **Resistance from Fossil Fuel Industries:** The fossil fuel sector, with its economic and political influence, often resists policies that encourage clean energy.

Overcoming the Challenges

1. **Policy Support:** Governments must provide financial incentives, tax benefits, and subsidies to encourage investment in renewable energy. India's renewable energy missions and U.S. clean energy credits are good examples.
2. **Innovation in Energy Storage:** Advances in battery technology are crucial for storing surplus solar and wind power, ensuring uninterrupted supply. Tesla and other innovators are already making progress in this area.
3. **Awareness and Individual Action:** Public participation plays a vital role. By adopting rooftop solar panels, using energy-efficient appliances, and reducing consumption, individuals can contribute to the clean energy movement.
4. **Global Partnerships:** Climate change requires collective action. Sharing technology and expertise can help developing nations transition faster.
5. **Smart Grids and Technology Integration:** Smart energy systems that balance supply and demand can make renewable energy more efficient and reliable.

Clean Energy and the Future

As the global population moves toward 10 billion by 2050, energy needs will soar. Sticking to fossil fuels will only worsen climate change, while clean energy provides a safe and sustainable alternative.

Innovations such as offshore wind farms, floating solar panels, hydrogen fuels, and advanced battery systems are shaping the future of clean energy. These technologies will not only protect the environment but also lead to new industries and opportunities.

Conclusion

The shift to clean energy is no longer optional—it is essential for human survival. Fossil fuels may have powered the past, but they cannot sustain the future. Clean energy offers multiple benefits: it reduces pollution, strengthens economies, creates jobs, and ensures long-term energy security.

Though challenges remain, global cooperation, technological innovation, and public awareness can overcome them. By embracing renewable energy today, we can leave behind a healthier, greener planet for tomorrow. Clean energy is more than just a solution—it is the foundation of a sustainable and just future.

पर्यावरण की सुरक्षा एक चुनौती



Dr. Manisha Sharma, Asst. Professor, Mathematics Department, Panjab University

Email Id: manishatewaripu@gmail.com

आज के आधुनिक युग में जहाँ विज्ञान और प्रौद्योगिकी ने अपार प्रगति की है, वहीं मानव ने प्रकृति का दोहन भी बहुत तेजी से किया है। फलस्वरूप पर्यावरण असंतुलन की समस्या दिन-प्रतिदिन गंभीर होती जा रही है।

पर्यावरण शब्द का अर्थ है हमारे चारों ओर का वातावरण – इसमें वायु, जल, भूमि, पेड़-पौधे, पशु-पक्षी तथा अन्य प्राकृतिक संसाधन सम्मिलित हैं। यही हमारे जीवन का आधार हैं। यदि पर्यावरण स्वस्थ है तो मानव जीवन भी स्वस्थ और सुरक्षित रहेगा।

लेकिन आज पर्यावरण प्रदूषण हमारी सबसे बड़ी समस्या बन चुका है। निरंतर औद्योगिकीकरण, वनों की कटाई, वाहनों से निकलने वाला धुआँ, प्लास्टिक का अत्यधिक प्रयोग, तथा जल स्रोतों का दूषित होना—ये सभी कारण पर्यावरण को नष्ट कर रहे हैं। इसका परिणाम है ग्लोबल वार्मिंग, जलवायु परिवर्तन, वर्षा में असंतुलन, ओज़ोन परत का क्षरण और विभिन्न बीमारियों का फैलना।

पर्यावरण की रक्षा के लिए हमें कुछ ठोस कदम उठाने होंगे,

1. अधिक से अधिक वृक्षारोपण करना।
2. जल और विद्युत की बचत करना।
3. प्लास्टिक के उपयोग को कम करना और पुनः उपयोग योग्य वस्तुओं को अपनाना।
4. प्रदूषण फैलाने वाले वाहनों और कारखानों पर नियंत्रण रखना।
5. "स्वच्छ भारत" और "हरित भारत" जैसे अभियानों को सफल बनाना।

पर्यावरण का संरक्षण हमारी जिम्मेदारी ही नहीं बल्कि आने वाली पीढ़ियों के प्रति हमारा कर्तव्य भी है। यदि हमने समय रहते कदम नहीं उठाए तो जीवन का अस्तित्व खतरे में पड़ सकता है। अतः हमें यह संकल्प लेना चाहिए कि हम प्रकृति का सम्मान करेंगे और पर्यावरण को सुरक्षित बनाएंगे।

हरित संकल्प

पर्यावरण की रक्षा — जीवन की सुरक्षा



श्रीमती प्रियतंका रस्तोगी, शिक्षिका, शेमराफ स्कूल, मोहाली, Email: srisukhmanidevender@gmail.com

"पर्यावरण की रक्षा जीवन की सुरक्षा" - यह केवल एक नारा नहीं, बल्कि जीवन का सत्य है। पर्यावरण हमारे अस्तित्व का आधार है। इसके बिना जीवन की कल्पना भी असंभव है। पर्यावरण का अर्थ केवल पेड़-पौधों या वायु से नहीं, बल्कि उस संपूर्ण प्राकृतिक तंत्र से है जिसमें मानव, पशु-पक्षी, नदियाँ, पर्वत, सागर, वायु, भूमि और आकाश - सब एक-दूसरे से जुड़कर जीवन चक्र को संतुलित रखते हैं।

जब यह संतुलन बिगड़ता है, तब जीवन संकट में पड़ जाता है। आज हम इसी स्थिति की ओर बढ़ रहे हैं। औद्योगीकरण, शहरीकरण, वनों की अंधाधुंध कटाई, प्लास्टिक का अत्यधिक उपयोग और बढ़ता प्रदूषण - ये सब हमारे पर्यावरण को धीरे-धीरे विषाक्त बना रहे हैं। नदियाँ जो कभी जीवनदायिनी थीं, अब प्रदूषण से कराह रही हैं। वायु में इतना धुआँ घुल चुका है कि सांस लेना कठिन हो गया है। ग्लोबल वार्मिंग के कारण ध्रुवों की बर्फ पिघल रही है, समुद्र का स्तर बढ़ रहा है और असामान्य जलवायु परिवर्तन देखने को मिल रहे हैं।

यदि यह क्रम यूँ ही चलता रहा, तो आने वाली पीढ़ियों के लिए धरती पर जीवन संकटग्रस्त हो जाएगा। इसलिए पर्यावरण की रक्षा केवल एक विकल्प नहीं, बल्कि हमारी नैतिक, सामाजिक और मानवीय जिम्मेदारी है।

हमें यह समझना होगा कि सरकार अकेली पर्यावरण नहीं बचा सकती, जब तक हर नागरिक अपनी भूमिका न निभाए। हमें अपने दैनिक जीवन में छोटे-छोटे परिवर्तन करने होंगे —

- एक बार उपयोग होने वाले प्लास्टिक का उपयोग बंद करें।
- पेड़ों की कटाई रोकें और अधिक से अधिक पौधे लगाएँ।
- जल का संरक्षण करें, वर्षा जल संचयन अपनाएँ।
- वाहन का कम उपयोग करें और पैदल चलने या साइकिल चलाने की आदत डालें।

- बिजली की बचत करें और नवीकरणीय ऊर्जा स्रोतों को अपनाएँ।

भारत सरकार द्वारा चलाए गए कार्यक्रम - “स्वच्छ भारत अभियान”, “नमामि गंगे परियोजना”, “वन महोत्सव” और “प्लास्टिक मुक्त भारत अभियान” - हमारे देश को स्वच्छ और पर्यावरणीय दृष्टि से सशक्त बनाने की दिशा में सराहनीय प्रयास हैं।

परंतु यह भी याद रखना चाहिए कि पर्यावरण केवल हमारे चारों ओर नहीं है - हम स्वयं भी पर्यावरण का हिस्सा हैं। जब हम प्रकृति को हानि पहुँचाते हैं, तो वास्तव में स्वयं को ही नुकसान पहुँचाते हैं।

इसलिए आवश्यक है कि हम पर्यावरण को केवल एक संसाधन नहीं, बल्कि माता के रूप में देखें — “पृथ्वी हमारी जननी है और हम उसके संतान।” यदि हम अपनी माँ का सम्मान करते हैं, तो हमें धरती और उसके हर तत्व का भी आदर करना चाहिए।

आइए हम सब मिलकर यह संकल्प लें -

“हम प्रकृति का सम्मान करेंगे, उसे सहेजेंगे, बचाएँगे,
क्योंकि पर्यावरण की रक्षा ही , मानवता की सच्ची सुरक्षा है।”
“पर्यावरण है जीवन दान, इसी से सुरक्षित है मानवता की जान।”

पर्यावरण की रक्षा: हमारी दैनिक जिम्मेदारी



डॉ. राजेंद्र सिंह, वरिष्ठ वैज्ञानिक अधिकारी, पंजाब विश्वविद्यालय, चंडीगढ़, E mail: rajenderphysics@gmail.com

“धरती हमारी माँ है, उसकी रक्षा करना हमारा पहला धर्म है।”

हम जिस धरती पर रहते हैं, वही हमें पानी, हवा, भोजन और जीवन जीने के लिए सभी साधन देती है। लेकिन आज का कड़वा सच यह है कि हम अपनी गलत आदतों से इसी पर्यावरण को नष्ट कर रहे हैं। प्रदूषण लगातार बढ़ रहा है और इसका सीधा असर हमारे स्वास्थ्य, जीवन और आने वाली पीढ़ियों पर पड़ रहा है। यदि हम रोजमर्रा के कामों में छोटे-छोटे बदलाव करें, तो पर्यावरण की रक्षा की जा सकती है। आइए देखें कि हम किन तरीकों से अपनी धरती को सुरक्षित बना सकते हैं।

1. जल प्रदूषण रोकें:

पानी जीवन का आधार है, परंतु यह लगातार गंदा हो रहा है।

- घरेलू गंदगी, प्लास्टिक और रासायनिक कचरा नालियों और नदियों में डालने से पानी जहरीला हो जाता है। यह न सिर्फ पीने योग्य नहीं रहता बल्कि जलीय जीव भी मरने लगते हैं।
- हमें कोशिश करनी चाहिए कि पानी का उपयोग केवल आवश्यकता अनुसार करें। नल खुला छोड़ने की आदत बदलें और वर्षा के पानी को संग्रह करने की आदत डालें।
- कपड़े और बर्तन धोते समय डिटरजेंट का कम उपयोग करें क्योंकि इसमें मिले रसायन पानी को प्रदूषित करते हैं।

2. कागज़ और प्लास्टिक न जलाएँ

हम अक्सर पुराने कागज़ या प्लास्टिक की थैलियाँ जलाकर नष्ट करते हैं।

- ऐसा करने से जहरीली गैसों निकलती हैं जो हमारी साँस लेने वाली हवा को प्रदूषित करती हैं और बीमारियाँ फैलाती हैं।
- पुराने कागज़ को रिसाइक्लिंग या ड्राफ्ट लिखने जैसे कार्यों में उपयोग किया जा सकता है।
- प्लास्टिक का प्रयोग कम से कम करें। बाजार जाते समय कपड़े या जूट के थैले का इस्तेमाल करें। इससे न केवल प्रदूषण कम होगा बल्कि धरती पर कचरे का बोझ भी घटेगा।

3. गाड़ियों से होने वाले प्रदूषण को कम करें

आजकल हर घर में कई वाहन हैं, जिससे धुआँ और प्रदूषण बढ़ता जा रहा है।

- यदि दूरी कम है, तो पैदल चलना या साइकिल का उपयोग करना चाहिए। इससे प्रदूषण भी कम होगा और स्वास्थ्य भी अच्छा रहेगा।
- सार्वजनिक परिवहन (जैसे बस, मेट्रो, ऑटो आदि) का प्रयोग करके भी प्रदूषण घटाया जा सकता है।
- यदि अपनी गाड़ी का प्रयोग करना ही पड़े, तो उसकी नियमित सर्विस करवाएँ ताकि इंजन से धुआँ कम निकले।

4. ध्वनि प्रदूषण से बचाव

तेज़ आवाज़ें हमारे दिमाग और स्वास्थ्य पर बुरा असर डालती हैं।

- लाउडस्पीकर का उपयोग सीमित करें और अनावश्यक रूप से ऊँची आवाज़ में संगीत न बजाएँ।
- पटाखों से न सिर्फ ध्वनि प्रदूषण फैलता है, बल्कि इससे धुआँ भी हवा को खराब करता है।
- वाहन चलाते समय हॉर्न का प्रयोग केवल ज़रूरत पड़ने पर करें, क्योंकि लगातार हॉर्न बजाना न केवल वातावरण को बल्कि मनुष्य की मानसिक शांति को भी बिगाड़ता है।

5. पर्यावरण में अनुशासन बनाएँ

अनुशासन ही पर्यावरण को स्वच्छ और संतुलित रखने का सबसे बड़ा साधन है।

- सड़क या खुले स्थान पर कचरा न फेंकें, हमेशा डस्टबिन का उपयोग करें।
- पेड़-पौधों की संख्या घटती जा रही है, इसलिए हमें पौधे लगाने और उनकी देखभाल करने की आदत डालनी चाहिए।
- यदि हम अपने आसपास सफाई और अनुशासन बनाए रखें, तो समाज भी प्रेरित होगा और धीरे-धीरे बड़ा परिवर्तन आएगा।

संदेश: पर्यावरण हमें जीवन देता है, इसलिए उसकी रक्षा करना हमारी प्राथमिक जिम्मेदारी है। यदि हर व्यक्ति अपनी दैनिक आदतों में छोटे-छोटे सुधार करे, तो हम इस धरती को प्रदूषण से बचा सकते हैं।

" धरती हमारी माँ है, और माँ का सम्मान करना हमारा धर्म है।"

आइए हम सब मिलकर यह संकल्प लें कि अपनी आदतों से पर्यावरण को सुरक्षित बनाएँगे और आने वाली पीढ़ियों को स्वच्छ, हरा-भरा और शांतिपूर्ण वातावरण देंगे।

प्रकृति का महत्व और संरक्षण की आवश्यकता



श्री गोपाल वाष्ण्य, बी.टेक तृतीय वर्ष के छात्र, इलेक्ट्रॉनिक्स और संचार इंजीनियरिंग
चितकारा विश्वविद्यालय, राजपुरा

हवा की ठंडी लहरों में कुछ कहानियाँ छुपी रहती हैं,
पेड़ों की छाँव तले भीगी सी रूहें सजी रहती हैं।
अगर बचा लो तुम इन उपहारों को सहेज कर,
तो आने वाली पीढ़ियाँ भी मुस्कान लिए रहती हैं।

प्रकृति हमेशा से इंसान की सबसे बड़ी शिक्षक रही है। जब हम हवा की ठंडी लहरों में साँस लेते हैं या पेड़ों की छाँव में सुकून पाते हैं, तब हमें यह समझ आता है कि **प्रकृति केवल एक पृष्ठभूमि नहीं है, बल्कि जीवन का सार है।** प्रकृति के बिना मानवता का अस्तित्व ही असंभव है।

आज के आधुनिक युग में हम तकनीक और विकास के पीछे दौड़ रहे हैं, लेकिन इसका एक दूसरा पहलू भी है – **पर्यावरणीय क्षरण।** वनों की कटाई, वायु और जल प्रदूषण, वैश्विक ऊष्मीकरण और जैव-विविधता की हानि हमें यह याद दिलाते हैं कि हमने अपनी लालच के चलते प्रकृति के संतुलन को बिगाड़ दिया है। इंसान ने हमेशा प्रकृति से लिया है, लेकिन उसे लौटाना भूल गया है। यदि यह असंतुलन ऐसे ही चलता रहा तो आने वाली पीढ़ियों को एक अस्वस्थ और अस्थिर ग्रह विरासत में मिलेगा।

हमें प्रकृति की रक्षा क्यों करनी चाहिए?

सबसे पहली बात, प्रकृति ही हमारे अस्तित्व की नींव है। जो ऑक्सीजन हम लेते हैं, पानी जो हम पीते हैं, और भोजन जो हम खाते हैं – यह सब सीधे-सीधे पर्यावरण से ही आता है। यदि हम प्रकृति को नुकसान पहुँचाते हैं, तो अप्रत्यक्ष रूप से हम अपनी ही जीवित रहने की संभावना को खतरे में डालते हैं।

दूसरी बात, प्रकृति हमें मानसिक और भावनात्मक स्थिरता भी देती है। पर्वत, नदियाँ, जंगल और यहाँ तक कि एक छोटे से बगीचे की हरियाली भी मनुष्य के मन को शांति प्रदान करती है। इसीलिए, प्रकृति की रक्षा करना केवल शारीरिक जीवन के लिए ही नहीं, बल्कि *मानसिक संतुलन* के लिए भी आवश्यक है।

तीसरी बात, प्रत्येक पीढ़ी का यह दायित्व है कि वह अपने बाद आने वाली पीढ़ियों के लिए एक बेहतर संसार छोड़े। यदि हम आज सजग निर्णय लें – जैसे नवीकरणीय ऊर्जा का प्रयोग करना, प्लास्टिक प्रदूषण कम करना और वनों का संरक्षण बढ़ावा देना – तो हम एक स्थायी और संतुलित भविष्य का निर्माण कर सकते हैं।

प्रकृति की रक्षा करना एक **नैतिक जिम्मेदारी** भी है। जैसा कि पहले कहा गया है, “*जितनी सुंदर ये पंक्तियाँ हैं, उतनी ही सुंदर हमारी प्रकृति।*” हमें आवश्यकता है कि हम इस सौंदर्य को समझें, इसका सही उपयोग करें और इसका सम्मान करें। केवल तभी हम एक स्वस्थ, उत्पादक और शांतिपूर्ण संसार का निर्माण कर पाएँगे।

LICHENS: A BIO INDICATOR



Ms. Chanchal Thakur, student - B.SC Medical (III) P.G.C.G-4, Email Id: chanchalthakur725@gmail.com

Lichens are unique symbiotic organisms formed by the association of a fungus (mycobiont) and an alga or cyanobacterium (phycobiont). This partnership allows them to survive in diverse and extreme habitats, ranging from bare rocks to tree trunks and even urban walls. Their high sensitivity to environmental changes, especially air quality, makes them excellent bioindicators.

What are Bioindicators?

Bioindicators are living organisms used to monitor the health of the environment. They respond in visible and measurable ways to pollutants, making it possible to assess the degree of pollution or habitat disturbance without the need for expensive instruments.

Lichens as an Air Pollution Indicators: Lichens absorb most of their nutrients directly from the atmosphere through rainwater and dust particles. They lack a protective cuticle, which makes them highly sensitive to atmospheric pollutants, especially sulphur dioxide (SO₂), nitrogen oxides, ozone, heavy metals, and acid rain. When air pollution levels rise, lichens either reduce in number, show discoloration, or completely disappear.

For example:

1. Fruticose lichens (e.g., Usnea) are most sensitive to pollution and vanish first.
2. Foliose lichens show moderate tolerance.
3. Crustose lichens (e.g., Lecanora) are most tolerant and often survive in polluted cities.
4. This graded tolerance allows scientists to classify areas into zones of pollution intensity.

Types of Indicators

1. Presence/Absence Indicators – Sensitive lichens disappear from polluted areas, while tolerant ones remain.

2. Physiological Indicators – Changes in pigment, chlorophyll degradation, or reduced growth show pollution stress.

3. Bio accumulators – Some lichens absorb and store heavy metals, radioactive substances, and nitrogen compounds, helping in detecting pollutants that may not easily measured.

APPLICATIONS:

1. Monitoring Air Quality – Lichens are widely used in urban and industrial regions to track SO₂ and heavy metal pollution.

2. Climate Change Studies – Shifts in lichen distribution patterns give clues about global warming and habitat alterations.

3. Ecosystem Health – The richness and diversity of lichens reflect the overall ecological balance of a region.

4. Forest Management – Certain lichen species serve as indicators of old-growth forests and help in biodiversity conservation.

Advantages of Using Lichens as Bioindicators

1. Cost-effective and natural method of monitoring.
2. Provide long-term records of environmental changes.
3. Detect pollutants even at very low concentrations.
4. Can be used in remote areas where technical monitoring is difficult.

Limitations : They respond slowly to rapid changes, making them less useful for short-term monitoring. Other environmental factors (humidity, light, temperature) can also influence lichen growth, sometimes complicating interpretations.

Conclusion: Lichens, often overlooked as simple organisms, play a vital role in environmental monitoring. Their sensitivity to pollutants makes them reliable natural bioindicators of air quality and ecosystem health. As environmental concerns like urbanization, industrialization, and climate change increase, lichens continue to serve as silent but powerful sentinels of our planet's wellbeing.

पानी की अंतिम बूँद – 2040 की डायरी से

लेखक: अनिल ठाकुर, Email id: vfmlp@gmail.com

"आज की चुप्पी, कल की चीख बन जाएगी... जब पानी होगा, लेकिन पीने लायक नहीं।"

7 जून 2040 – न्यू पंजाब जल टावर (ज़ोन 3)

मैं अनिल ठाकुर हूँ - जल खोज अधिकारी। यह मेरा 78वाँ मिशन था - पानी की एक सुरक्षित बूँद की तलाश में। आज हमने सरधना नामक प्राचीन गाँव के खंडहरों में 12 किलोमीटर गहराई तक खुदाई की। वहाँ एक सूखा पड़ा कुआँ मिला, जिसमें बस धूल और इतिहास बचा था। लेकिन एक कोने में मिट्टी के नीचे दबा **एक टिन का डिब्बा** मिला। उसमें एक चिट्ठी और दो बूँद पानी थीं।

चिट्ठी में लिखा था - *"हमने सोचा था कि धरती हमें माफ कर देगी। शायद अब बहुत देर हो चुकी है।"*

मैंने वो बूँदें हथेली पर टपकाई और देखा - यह पानी नहीं था, बल्कि पछतावे का इतिहास था।

2040 की भयावह सच्चाई

- पानी अब वस्तु नहीं, बल्कि **करेंसी** है।
- **1 लीटर पानी = ₹1200।**
- हर व्यक्ति को सरकारी **जल बैंक** में खाता खुलवाना पड़ता है।
- नहाना अब विलासिता है, और टॉयलेट **शून्य जल तकनीक** पर निर्भर हैं।
- बारिश अब चमत्कार मानी जाती है; लोग बादल देखने के लिए टिकट खरीदते हैं।

कहाँ चूके हम?

सन् 2025 से ही चेतावनी थी, लेकिन किसी ने ध्यान नहीं दिया।

- RO से निकलने वाले 70% बर्बाद पानी को **"सिस्टम की खामी"** कहकर नज़रअंदाज़ किया।
- खेतों में बेहिसाब बोरिंग होती रही।
- नदियाँ-तालाब कचरे के ढेर में बदल दिए गए।
- वर्षा जल संचयन कभी प्राथमिकता नहीं बना।
- और सबसे बड़ी भूल — पानी को असीमित संसाधन समझना।

आज नदियाँ केवल नक्शों पर नीली लकीर रह गई हैं। गाँव के बच्चे अब बर्फ नहीं देख पाते। और दुखद यह है कि हम जानते थे, फिर भी कुछ किया नहीं।

क्या यह भविष्य बदला जा सकता था?

हाँ, बिल्कुल। और अभी भी समय है।

समाधान – एक जल क्रांति

1. वर्षा जल संचयन अनिवार्य हो – हर घर, स्कूल और दफ्तर में।
2. वाटर क्रेडिट सिस्टम – पानी बचाने वालों को पुरस्कार और अतिरिक्त सुविधाएँ।
3. जल शोधन तकनीक सबके लिए – बायो-सैंड फ़िल्टर, एटमॉस्फेरिक वाटर जनरेटर।
4. स्मार्ट वॉटर मीटरिंग – डिजिटल मीटर बताएँ कब और कितना पानी खर्च हुआ।
5. जल शिक्षा – स्कूलों में नया विषय “*Water Wisdom*” ।
6. परंपरागत ज्ञान का उपयोग – बावड़ी, पाट प्रणाली, ग्लेशियर खेती जैसी विधियाँ पुनर्जीवित हों।

कल्पना कीजिए एक नया भारत

- हर मोहल्ले में पानी बैंक।
- हर पंचायत में जल संसदा।
- चुनावी बहसों सड़क-बिजली पर नहीं, बल्कि जल संरक्षण योजनाओं पर।
- बच्चे अपने विज्ञान प्रोजेक्ट में धूप से पानी बनाने की मशीन बनाते हुए।
- और सबसे सुंदर दृश्य – एक दादी अपने पोते से कह रही हैं:

“बेटा, ये तालाब तुम्हारे दादाजी ने नहीं बनाया था... उन्होंने इसे बचाया था।”

अंतिम संदेश

यदि आज हम नहीं जागे, तो कल सिर्फ पछतावा बचेगा।

पानी कोई मुद्दा नहीं है — यह जीवन का मूल है।

अब यह चुनावों, सरकारों या संस्थाओं का सवाल नहीं।

यह सवाल है — आप और मैं क्या कर रहे हैं?

आइए संकल्प लें —

“हर बूँद की कीमत है, और हम हर बूँद बचाएँगे।”

यह लेख केवल चेतावनी नहीं, बल्कि एक नई जल क्रांति की शुरुआत है।

English Translation

The Last Drop – A Diary from 2040

Author: Anil Thakur

"Today's silence will become tomorrow's scream... when water exists, but none of it is fit to drink."

June 7, 2040 – New Punjab Water Tower (Zone 3)

I am Anil Thaur – a Water Search Officer. This was my 78th mission, a quest for a single safe drop of water.

Today we drilled 12 kilometers beneath the ruins of an old village named Sardhana. There we found a dried-up well—filled only with dust and history. But hidden in a corner, beneath the soil, was a tin box. Inside it lay a letter... and two drops of water.

The letter read: *"We thought the Earth would forgive us. Perhaps now it is too late."*

I let those drops fall on my palm. They weren't just water. They were history. A history of regret.

The Reality of 2040

- Water is no longer a resource; it is **currency**.
- **1 liter of water = ₹1200.**
- Every citizen must have an account in the Government Water Bank.
- Bathing is a luxury. Toilets run on *zero-water technology*.
- Rain is no longer a festival, but a rare miracle. People now buy tickets to "watch clouds."

How Did We Reach Here?

Warnings were loud in 2025, but no one listened.

- 70% of water wasted by RO systems was ignored as a *"technical flaw."*
- Farms continued reckless over-extraction through borewells.
- Rivers and lakes became dumping grounds for sewage and waste.
- Rainwater harvesting was never prioritized.
- Worst of all — water was never treated as a **limited resource**.

Today, rivers are just blue lines on maps. Villages haven't seen snow in decades. And the bitterest truth — we all knew this was coming, but did nothing.

Could This Future Have Been Different?

Yes. Absolutely. And even now, it is not too late.

The Solutions – A Water Revolution

1. **Mandatory Rainwater Harvesting** – on every rooftop, school, and office
2. **Water Credit System** – reward households and institutions that save water with tax rebates, incentives, or extra water quotas.
3. **Democratize Water Purification Technology** – from Bio-sand filters to Atmospheric Water Generators and solar distillation units, affordable and locally made.
4. **Smart Water Metering** – digital meters that show how, when, and where water is being consumed.
5. **Water Education in Schools** – introduce *“Water Wisdom”* as a subject to teach children about crisis and solutions.
6. **Revive Traditional Knowledge** – India’s stepwells, canal systems, and glacier farming must be combined with modern technology.

Imagine a New India

- Every neighborhood has a **Water Bank**.
- Every village holds a **Water Parliament** to decide irrigation policies.
- Election promises revolve not around roads or electricity, but **water conservation plans**.
- Children build science projects that create drinking water from sunlight or even sweat.
- And the most beautiful vision—

An old grandmother tells her grandson at a pond:

“My child, your grandfather did not build this pond... he saved it.”

Final Message

If we don’t wake up today, tomorrow will hold nothing but regret.

Water is not just an **“issue.”** It is the very **essence of life**.

This is not about governments or institutions.

It is about you and me.

Let us take a pledge —

“Every drop count, and we will save every drop.”

Because this is not merely a warning.

This is the beginning of a **Water Revolution**.

कविता

चेतन्या शर्मा, चितकारा इंटरनैशनल स्कूल, आठवीं कक्ष; रोहिणी शर्मा, असोसिएट प्रोफेसर, पंजाब विश्वविद्यालय

Email Id: manishatewaripu@gmail.com

1- "साफ हवा"

साफ हवा में सांसें लेना,
बदले में कुछ नहीं देना।
फिर भी दूषित करते रहना,
यही है इन्सानों का करना।
पेड़ काटना, खेत जलाना,
फैक्टरियों का धुआं उड़ाना,
नदियाँ गंदी करते रहना,
फिर भी अंतर्मन से कहना।
हम हैं राजा इस दुनिया के,
मर्जी करेंगे हर जगह पे।

2- “पर्यावरण की सुरक्षा”

हरे-भरे ये जंगल प्यारे,
धरती के हैं गहने सारे।
इनसे मिलती जीवन की साँस,
मत करो इनका कभी विनाश।
नदियाँ, झरने, जल के धारे,
सबको जीवन दें सहारे।
पर अगर इन्हें दूषित कर देंगे,
तो कैसे हम जीवन जिएंगे?
पेड़ लगाओ, छाँव मिलेगी,
स्वच्छ हवा भी साथ मिलेगी॥
फूल खिलेंगे, पंछी गाएँगे,
धरती पर सुख-शांति आएंगे।
आओ मिलकर प्रतिज्ञा करें,
धरती माँ की रक्षा करें।
स्वच्छ, हरित बने संसार,
यही है जीवन का आधार।

कविता

सिमरनजीत कौर, सहायक प्रोफेसर, सूचना प्रौद्योगिकी विभाग, आर.के. आर्य कॉलेज,
ईमेल आईडी: kaursimranjeet4731@gmail.com

“तेज आँधियाँ”

तेज आँधियाँ पेड़ों की जड़ से हिला देती हैं
हरे पत्तों को उखाड़ कर जमीं पे बिखा देती हैं
जो कल तक टहनियों से जुड़े इशतहार थे
सूखे तिनकों सा दूर तक हवा में उड़ा देती हैं
जमीं की मिट्टी को निस्वत से इनकार ना होता
देर तक देखते ही देखते मिट्टी को मिट्टी में मिला देती हैं
आँधियों के जोर से जो किसी तरह गिर न पाया
जमीं पर लाकर उसे मन्जरो से गिरा देती हैं
शायद, हरे पत्तों सी ताजगी भरे हों तो ठीक
सूखी रुख भी अड़ जाएं तो हल्का सुखा देती हैं

2- “बरसात के मौसम का डर”

इस बार जब मौसम में बरसात होगी
किसी खास मुद्दे पर तुमसे बात होगी
गम के बादल आँखों में मँडरा रहे होंगे
भीगी पलकों से तुमसे मुलाकात होगी
देर तक बरसेंगी गलियों में गरीबों की आहें
गम में भीगी तो आबाद रात होगी
बादल गरज कर बरसकों को डरायेंगे धमकायेंगे
उम्र तक सीलन भरी ज़िन्दगी हयात होगी
किसी के आँसू किसी की पलकों से चू रहे होंगे
चलती बरसात में तुम देखना ये करामात होगी
गरीब पानी की इस फ़ितरत से डरने लगेंगे
इस बार मौसम की कुछ ऐसी बरसात होगी

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A Child's Imagination-Don't Litter, Respect the Nature



Paramakshi Sabharwal, Class 2 'D', KB DAV, Sector 7, Chandigarh



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Ozone Layer & Its Impact on Us



Manpreet Kaur, Student, PGGCG, Sector 42, Chandigarh , Email Id: manpreetk.1513@gmail.com



Paryavaran Sanrakshan Gatividhi Punjab

Social Internship Program (SIP)-01

Dated:07-09-2025

Venue of Training Session -Vidya Bhawan,Jalandhar



Paryavaran Sanrakshan Gatividhi, Punjab



