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About E-magazine

“Earth Root” is an open access e-magazine in the discipline of Environmental sciences published by Earth Root Foundation. The aim of the e-magazine is to provide information and upgradation of knowledge about environmental issues on wider scale and to share ideas and resources to the readers. Using essential knowledge people can lead a healthy life, which is more sustainable and can connect with ongoing efforts for stopping catastrophically the climate change. E-magazine caters to all related environmental aspects ranging from big issues like climate change, renewable energy and pollutants in the atmosphere to the health of human and living beings on Earth. We also take topics of water resources and efforts and measurement to provide optimum use of it; including large scale atmospheric circulation linked with oceans and ecology.

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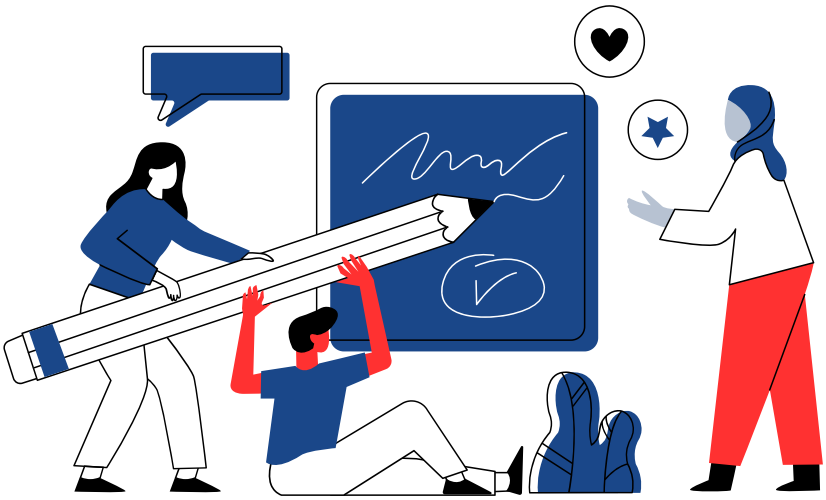

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A CLIMATE CRISIS IGNORED: TRUMP'S ENVIRONMENTAL NEGLECT AND THE PARIS AGREEMENT WITHDRAWAL

-ANIKAIT SRIVASTAVA,
University school of Environment Management,
Guru Govind Singh Indraprastha University

"The Earth is what we all have in common" With Trump's return to the White House, this sentiment seems to be buried beneath economic nationalism and climate denial. As anticipated, Trump's administration swiftly reinstated policies favouring economic expansion at the expense of environmental sustainability. Among the most controversial decisions was the United States' renewed withdrawal from the Paris Agreement, signalling a disregard for global efforts to combat the worsening climate crisis. Trump's first withdrawal from the Paris Agreement in 2017 was swiftly reversed by President Joe Biden upon taking the office in 2021. However, with Trump's return, the U.S. has once again distanced itself from this crucial global commitment, joining Iran, Yemen, and Libya as the only nations currently outside the accord.

The Paris Agreement, adopted by 196 countries in 2015, is a legally binding international treaty on climate change. The agreement's primary objective is to cap global temperature rise well below 20 C above pre-industrial levels, with a target of limiting it to 1.50 C. The U.S., as the world's second largest emitter of carbon dioxide, has historically played a significant role in global climate negotiations. However, under Trump's leadership, the U.S. turned its back on this critical pact, undermining both international solidarity and domestic environmental progress. The White House has also declared a "NATIONAL ENERGY EMERGENCY", introducing a raft of changes aimed at ramping up domestic oil and gas production while reversing crucial climate regulations and policies. During Trump's previous term, his administration rolled back nearly 100 environmental rules, weakening regulations on various environmental aspects. Now, with his return to power, Trump is expected to double down on these policies, dismissing the urgent need to address the climate crisis. His unwavering support for the conventional

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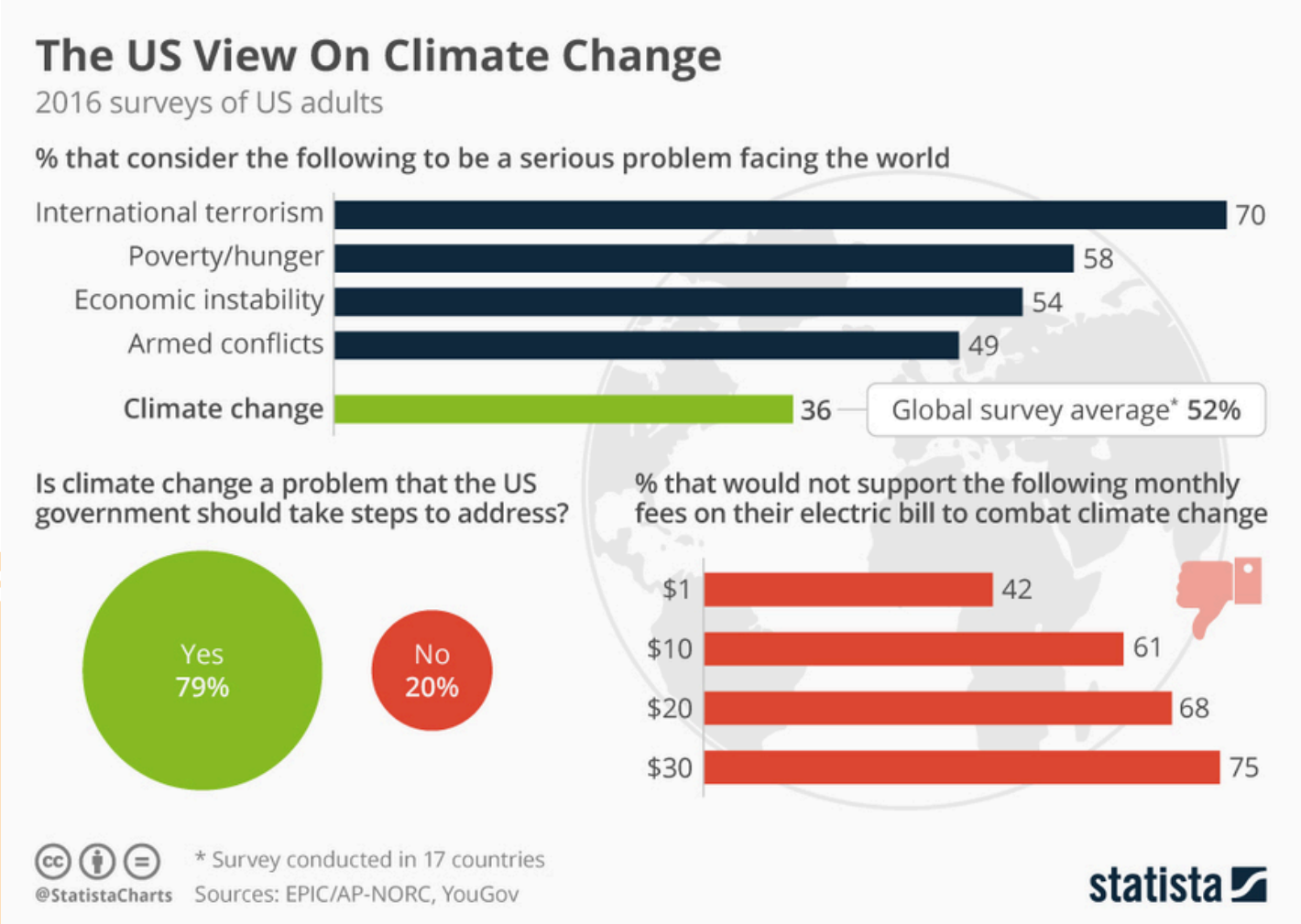
sources of energy including the fossil fuel industry is one of the most alarming aspects of Trump's leadership. This fossil fuel centric agenda isolates the U.S. from the global coalition striving to cut emissions, exacerbating the climate crisis rather than mitigating it.

Trump's environmental policies have dire consequences, both domestically and globally. Climate change is no longer a distant threat, it is an ongoing catastrophe. The U.S. has already experienced record-breaking wildfires, including the devastating Los Angeles wildfires that have scorched thousands of acres, destroyed homes and displaced countless residents. In recent years, California has seen some of the most intense and frequent wildfires in history, fuelled by rising temperatures along with prolonged.

The worsening wildfire crisis not only threatens lives and property but also exacerbated air pollution, releasing massive amounts of carbon dioxide and further accelerating global warming. Beyond environmental devastation, withdrawing from the Paris Agreement also damages America's geopolitical standing. The agreement is more than a climate pact, it is a symbol of global unity and shared responsibilities. With climate disasters intensifying worldwide, the U.S. must recognise that environmental responsibility is not an economic burden, but a necessity for a sustainable future. Trump's regressive policies not only risk long-term ecological degradation but also jeopardize America's standing in global climate leadership. The world cannot afford another era of environmental negligence.



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INDIA'S PATH TO A SUSTAINABLE ENERGY FUTURE

-Dr. Palak Balyan,
Research Lead, Climate Trends

India is undergoing a profound transformation in its energy sector, balancing economic growth with sustainability. As the world's third-largest energy consumer, the country's choices will significantly impact global emissions and the future of clean energy. With ambitious policies and technological advancements, India is striving to shift from fossil fuels to renewable energy sources while ensuring energy security for its growing population.

The transition is driven by a combination of policy measures, economic incentives, and international commitments. The government has set ambitious renewable energy targets, aiming for 500 GW of non-fossil fuel capacity by 2030 and achieving net-zero emissions by 2070. These goals reflect India's commitment to combating climate change while addressing the rising energy demands of its industries and households.

Solar and wind energy have emerged as central pillars of this transition. The country has rapidly expanded its solar power capacity, positioning itself as a global leader in photovoltaic installations. The falling costs of solar panels, coupled with government incentives like production-linked schemes and competitive bidding, have encouraged private sector investments. Solar parks, floating solar farms, and rooftop installations are gaining momentum across states, making clean energy accessible at different scales. Similarly, wind power continues to play a crucial role, especially in coastal and high-wind potential regions such as Tamil Nadu and Gujarat.

However, integrating renewable energy into the national grid presents significant challenges. Unlike coal and gas, which provide consistent power, renewables are inherently variable. To address this, India is investing in energy storage technologies such as battery storage systems and pumped hydro storage. Grid modernization, smart metering, and transmission infrastructure development are also crucial to ensure seamless energy distribution.

Beyond solar and wind, other renewable sources are being explored. Biomass and bioenergy offer potential solutions for decentralized energy generation, particularly in rural areas where agricultural residues can be utilized. India is also making strides in green hydrogen production, which could revolutionize industrial sectors such as steel and cement by replacing fossil fuels with a cleaner alternative.

Additionally, small-scale hydropower projects contribute to local energy supply while minimizing environmental disruptions.

The role of electric mobility in energy transition is also gaining attention. India's automobile industry is witnessing a gradual shift towards electric vehicles (EVs), supported by incentives such as the FAME (Faster Adoption and Manufacturing of Hybrid and Electric Vehicles) scheme. The deployment of charging infrastructure is expanding, and battery technology advancements are making EVs a more viable alternative to traditional fuel-powered vehicles. As transport electrification progresses, the reliance on imported oil is expected to decrease, improving energy security.

Despite these positive developments, India faces several obstacles in its energy transition journey. Coal remains a dominant source of power, supplying over 50% of the country's electricity needs. The transition from coal to cleaner alternatives must be carefully managed to prevent economic disruption, particularly in states where mining is a major source of employment. Just transition policies that support coal-dependent communities through skill development and alternative livelihoods are essential.

Another challenge lies in financing renewable energy projects. While India attracts significant investments in green energy, more capital is required to meet its ambitious targets. International climate finance, domestic policy incentives, and innovative funding mechanisms, such as green bonds, play a critical role in bridging the financial gap. Strengthening public-private partnerships and reducing bureaucratic hurdles will also encourage greater participation from investors.

Energy efficiency is another crucial aspect of the transition. Reducing energy consumption in industries, buildings, and households can significantly lower overall demand. Programs such as the Perform, Achieve, and Trade (PAT) scheme encourage industries to improve efficiency through market-based mechanisms. Similarly, promoting LED lighting, energy-efficient appliances, and smart grids contributes to demand-side management.

Public awareness and behavioral changes will further accelerate the transition. Encouraging citizens to adopt renewable energy solutions, practice energy conservation, and support sustainable mobility options can collectively contribute to national energy goals. Educational campaigns, incentives for green practices, and community-based renewable energy projects can enhance public participation in the clean energy movement.

India's energy transition is not just an environmental necessity but also an opportunity for economic growth and job creation. The renewable energy sector has already generated millions of employment opportunities, and as the industry expands, more green jobs will be created. Skill development programs focused on solar panel installation, wind turbine maintenance, and energy auditing can equip the workforce for emerging opportunities in the clean energy sector.

While the journey towards a sustainable energy future is complex, India's progress in adopting renewable energy, improving grid resilience, and advancing clean technologies is commendable. With sustained policy support, financial innovation, and public engagement, the country is well-positioned to become a global leader in the energy transition. The coming decades will determine how effectively India can balance economic aspirations with climate commitments, ensuring a cleaner, greener, and more energy-secure future for its people.

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INDIA'S CRYOSPHERE IN PERIL THE NEED FOR ACTION

-Ankur Goel
Director, Copper Cross Solutions

India's glaciers often referred to as the "water towers" of the subcontinent, are vital for sustaining millions of lives. These frozen reserves, nestled in the mighty Himalayas, feed some of the most significant river systems, including the Ganges, Brahmaputra, and Indus. However, rapid climate change and human activities threaten their existence, posing severe ecological, economic, and social consequences. The urgency to preserve these glaciers has never been greater, as their retreat could lead to disastrous repercussions for both the environment and human societies.

Glaciers play a crucial role in maintaining ecological balance, acting as natural reservoirs that regulate water flow into rivers. During warmer months, they release stored water, ensuring a steady supply for agriculture, drinking, and hydroelectric power generation. Their slow melting maintains a stable hydrological cycle, which prevents extreme fluctuations in river levels. Without these ice masses, seasonal water availability would become highly unpredictable, affecting millions of farmers who depend on glacier-fed rivers for irrigation. A reduction in glacial mass would disrupt food production, leading to economic instability, increased poverty, and food insecurity.

The rapid melting of glaciers has been linked to global warming, with rising temperatures accelerating ice loss at an unprecedented rate. Studies indicate that Himalayan glaciers are receding faster than the global average, leading to significant reductions in their overall mass. This trend is attributed to increased greenhouse gas emissions, deforestation, and industrial pollution, all of which contribute to rising temperatures in the region. Black carbon, produced from biomass burning and fossil fuel combustion, is another major factor in glacier retreat. These fine particulate pollutants settle on ice surfaces, reducing their reflectivity and causing them to absorb more heat, thereby accelerating melting.

Apart from climate change, unregulated tourism and infrastructure development have also put immense pressure on fragile glacial ecosystems. The surge in trekking, mountaineering, and pilgrimage activities has increased pollution, leading to waste accumulation in high-altitude regions. Inadequate waste management systems result in non-biodegradable waste, such as plastics

and discarded equipment, contaminating glacial lakes and affecting the purity of meltwater. Additionally, large-scale construction projects, such as roads and hydropower dams, disturb the delicate balance of these ecosystems. The blasting of mountains for infrastructure development weakens the glacial structure, making it more vulnerable to collapse.

One of the most alarming consequences of glacier retreat is the formation of glacial lake outburst floods (GLOFs). As glaciers melt, they leave behind moraine-dammed lakes, which are unstable and prone to bursting due to increased water pressure or seismic activity. A sudden outburst can release massive amounts of water downstream, causing catastrophic floods that destroy settlements, infrastructure, and agricultural fields. Several such events have already occurred in the Indian Himalayas, resulting in significant loss of life and property. The Kedarnath disaster of 2013 and the Chamoli flood of 2021 serve as stark reminders of the risks posed by glacial instability.

Glacier loss also has far-reaching implications for biodiversity. The cold and unique ecosystems of these regions support a variety of plant and animal species that are specially adapted to extreme conditions. As temperatures rise and ice cover diminishes, these species face habitat loss, leading to biodiversity decline. Endemic species such as the snow leopard, Himalayan blue sheep, and alpine flora are at risk due to changing climatic patterns. The shift in temperature regimes also alters migration patterns and breeding cycles of various species, leading to ecological imbalances that disrupt food chains and species survival.

The socio-economic consequences of glacier retreat are profound, particularly for communities that depend on glacial meltwater for survival. Many villages in the Himalayan region rely on spring-fed streams that originate from glaciers. As these glaciers shrink, water availability diminishes, forcing people to migrate in search of better living conditions. The phenomenon of "climate refugees" is becoming increasingly common in high-altitude areas, where reduced water supply and unpredictable weather patterns make agriculture and livestock farming unsustainable. This migration exerts additional pressure on urban centers, which already struggle with resource management and infrastructure challenges.

Hydropower, a significant energy source for India, is also at risk due to glacier retreat. Many hydropower projects depend on a steady flow of meltwater to generate electricity. However, erratic glacial melting patterns disrupt power generation, leading to energy shortages and increased reliance on fossil fuels. This not only affects economic stability but also contradicts the country's commitment to renewable energy and carbon neutrality. Ensuring the preservation of glaciers is essential for maintaining energy security and reducing dependence on non-renewable resources.

Addressing the issue of glacier preservation requires a multi-faceted approach that combines policy interventions, scientific research, and community participation. Strengthening climate policies to reduce greenhouse gas emissions is a crucial step in mitigating global warming. India's commitments under international agreements, such as the Paris Accord, must be reinforced with stringent implementation of emission reduction targets. Encouraging the use of clean energy sources, promoting afforestation, and implementing stricter pollution control measures can contribute to slowing glacier melt.

Scientific monitoring of glaciers is essential to understand their behavior and predict future changes. Establishing dedicated research centers and deploying advanced satellite technology for real-time glacier monitoring can help in tracking changes and developing early warning systems for GLOFs. Collaboration between government agencies, scientific institutions, and international organizations can enhance research capabilities and foster better policy formulation. Citizen science initiatives, where local communities participate in data collection and conservation efforts, can also play a significant role in glacier preservation.

Sustainable tourism practices must be enforced to minimize environmental damage in glacial

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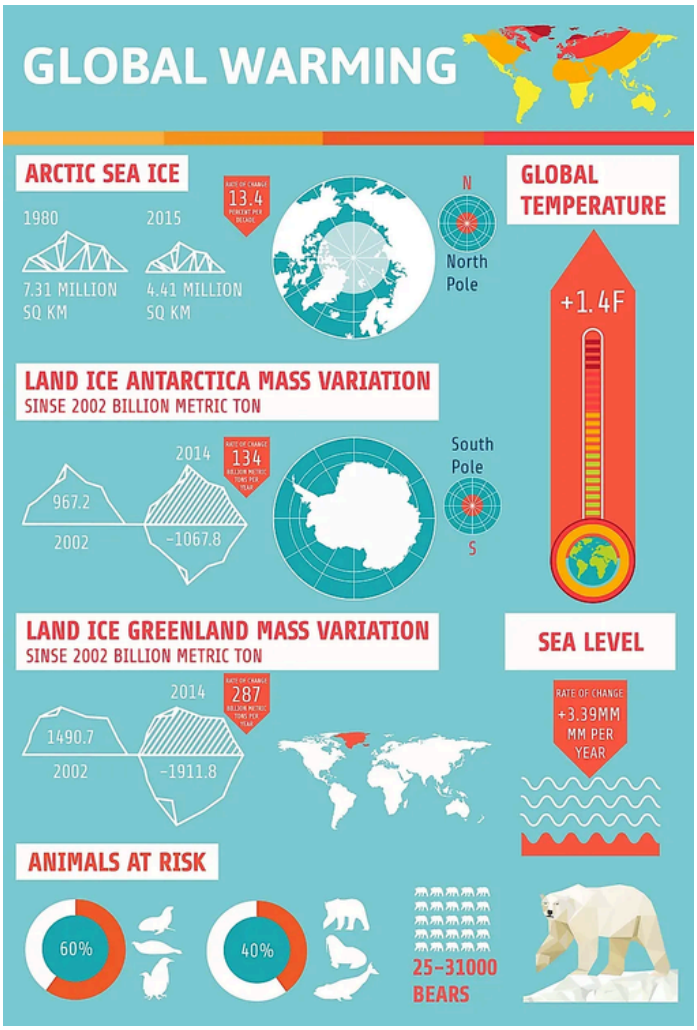
regions. Regulating the number of visitors, ensuring proper waste disposal, and promoting eco-friendly tourism activities can reduce the pressure on these fragile ecosystems. Local authorities and tour operators should work together to implement guidelines that protect the region's natural heritage while allowing people to experience its beauty responsibly. Creating awareness among tourists about the impact of their activities on glaciers can also encourage responsible behavior.

Community engagement is a key aspect of conservation efforts. Local communities, particularly those residing in high-altitude areas, possess invaluable traditional knowledge about environmental management. Integrating their practices with modern conservation strategies can yield effective results. Water conservation techniques, such as glacier grafting and artificial glacier creation, have been successfully implemented in some Himalayan villages to supplement water supply during dry months. Encouraging such innovative methods on a larger scale can help mitigate water shortages caused by glacier retreat.

The corporate sector also has a role to play in glacier preservation. Companies that operate in environmentally sensitive areas must adopt sustainable practices and contribute to conservation efforts through corporate social responsibility (CSR) initiatives. Supporting reforestation programs, investing in clean energy, and funding scientific research can help offset the negative impact of industrial activities. Businesses that depend on water-intensive processes should prioritize water conservation measures and reduce their carbon footprint to mitigate the effects of climate change on glaciers.

Education and public awareness are fundamental to fostering a culture of conservation. Schools and universities should integrate climate education into their curricula, emphasizing the importance of glaciers and their impact on human life. Media campaigns, documentaries, and social media outreach can further spread awareness about the need for glacier preservation. Informed citizens are more likely to advocate for policies that promote environmental sustainability and demand action from policymakers.

Preserving India's glaciers is not just an environmental necessity but a survival imperative. These ice reserves are intricately linked to water security, food production, energy generation, and biodiversity conservation. Their rapid decline threatens the very foundation of sustainable development in the region. A concerted effort from governments, scientists, communities, businesses, and individuals is required to protect these natural assets from further degradation. By taking immediate action, India can safeguard its glaciers for future generations and ensure that its rivers continue to nourish life as they have for centuries.



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QUALITY VERSUS DECEPTION : A CLOSER LOOK AT ADULTERATED FRUITS AND VEGETABLES IN THE MARKET

-Akanshi Sharma,
University school of Environment Management,
Guru Govind Singh Indraprastha University

The adulteration of fruits and vegetables poses a significant scare to public health and consumer trust in India. Fruits and Vegetables are core elements of human nutrition, delivering vital vitamins, minerals, and dietary fiber essential for good health. In India, where agriculture endures a significant portion of the population, the consumption of these nutrient-rich foods is not just a Gastronomic preference but a way of life. Alternatively, the safety and truthfulness of these dietary staples have come under surveillance due to the widespread issue of adulteration. Adulteration, defined as the intentional addition of secondary or harmful substances to food items poses acute threat to public health and the agricultural sector's sincerity.

Consumption of adulterated food for long will have both short-term and long-term impacts on our health. Hazardous effects of adulteration are correlated with diarrhea, abdominal pain, nausea, vomiting, eyesight problems, headache, cancer, anemia, insomnia, muscular paralysis and brain damage, stomach disorder, joint pain, liver disorder, dropsy, gastrointestinal problems, respiratory distress, cardiac arrest, glaucoma carcinogenic effects, kidney failure, digestive system disorders, etc.

While food adulteration is a global alarm, India's unique agricultural landscape, distribution networks, and regulatory obstacles demand a context-specific examination of adulteration in fruits and vegetables. The adulteration of fruits and vegetables accounts for a wide range of deceptive practices, including the use of artificial colors, chemical preservatives, pesticide residues, and the falsification of their origin or quality. Such practices not only misguide consumers but also pose serious health risks, leading to various health issues and diseases.

A comprehensive range of chemicals are used as adulterants in fruits and vegetables:

Calcium carbide is used to artificially ripen fruits and vegetables. It is often used traditionally in granular or powder form. The high cost and insufficiency of ethylene availability, faster-ripening capability due to the breakdown of glucose, and being comparatively cheaper than other chemicals are the root causes behind its vast usage.

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Oxytocin is a mammalian hormone that is widely used in bottle gourds, bitter gourds, pumpkins, and cucumbers to improve size and color. The saccharine mixture was found to be injected into melons and watermelons to enhance sweetness artificially. Dyes that are commonly used in vegetables are Rhodamine B, Auramine, Congo red, malachite green etc. Red dye is injected into watermelons to enhance the palatability of the consumers. Malachite green is widely used to make green vegetables such as green chili, peas, bitter gourds, lady finger etc., look greener, fresh, bright, and glowing. With the increasing globalization of food trade and the uncertainty of supply chains, recognizing and mitigating adulteration has become a remarkable challenge for supervisory authorities and beneficiaries across the world.

This article aims to provide an extensive analysis of the current challenges associated with the adulteration of fruits and vegetables, highlighting the various methods employed by unprincipled actors in the food industry. Adulteration can take many forms, from the use of harmful chemicals and dyes to the addition of lower-quality or even toxic substances, all in an effort to enhance the appearance or shelf life of produce. By evaluating the common adulterants and the potential health implications for consumers, this article seeks to shed light on the gravity of the issue. It will also explore the regulatory frameworks in place, the effectiveness of current enforcement measures, and the role of consumer awareness in combating this pervasive problem. Through comprehensive research and analysis, the article aims to raise awareness and encourage action to ensure the integrity of our food supply.

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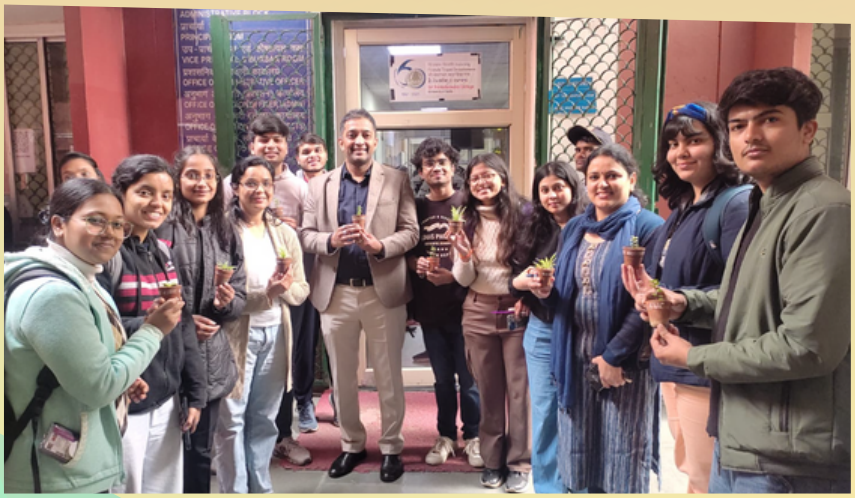
GREEN SCHOOL INITIATIVE PROGRAM BY SRI VENKATESWARA COLLEGE, UNIVERSITY OF DELHI

The Eco Club of Sri Venkateswara College, University of Delhi, recently conducted “Green School Initiative- An Environment and Health awareness program” 06 February 2025 at Navyug School, P&T Quarters, Sarojini Nagar, Delhi. This is as a part of the MoU between SVC and AIIMS, New Delhi.

The main objectives of the program were - to enhance the knowledge on how Environment Conservation is important, emphasizing on tree Plantation, promote sustainability, and create awareness about pollution to combat climate change. A quiz was conducted for grade 6 to 8 level students and was attended by 150+ students with high enthusiasm.

“Repurposed” kulhads were used by students of Sri Venkateswara College and planted with beautiful saplings and given away to the school students. It emphasized the need to reduce and recycle waste and motivated them to plant trees.

Sri Venkateswara College, University of Delhi along with the Department of Pulmonary Medicine and Sleep Disorders, AIIMS, New Delhi, have been conducting several such Environmental and Health awareness programs. Green School Initiative is an outreach program to sensitize school children about pressing environmental issues and associated health hazards. Adverse environmental changes have negative impacts on our quality of life, and the worst sufferers would be the future generations. Therefore, the need of the hour is to sensitize youth especially school children towards exigent environmental issues and challenges, and ways to mitigate and adapt to them. Thus, the sole purpose of this initiative is to create awareness among the younger generation as they are the torch bearers of future.



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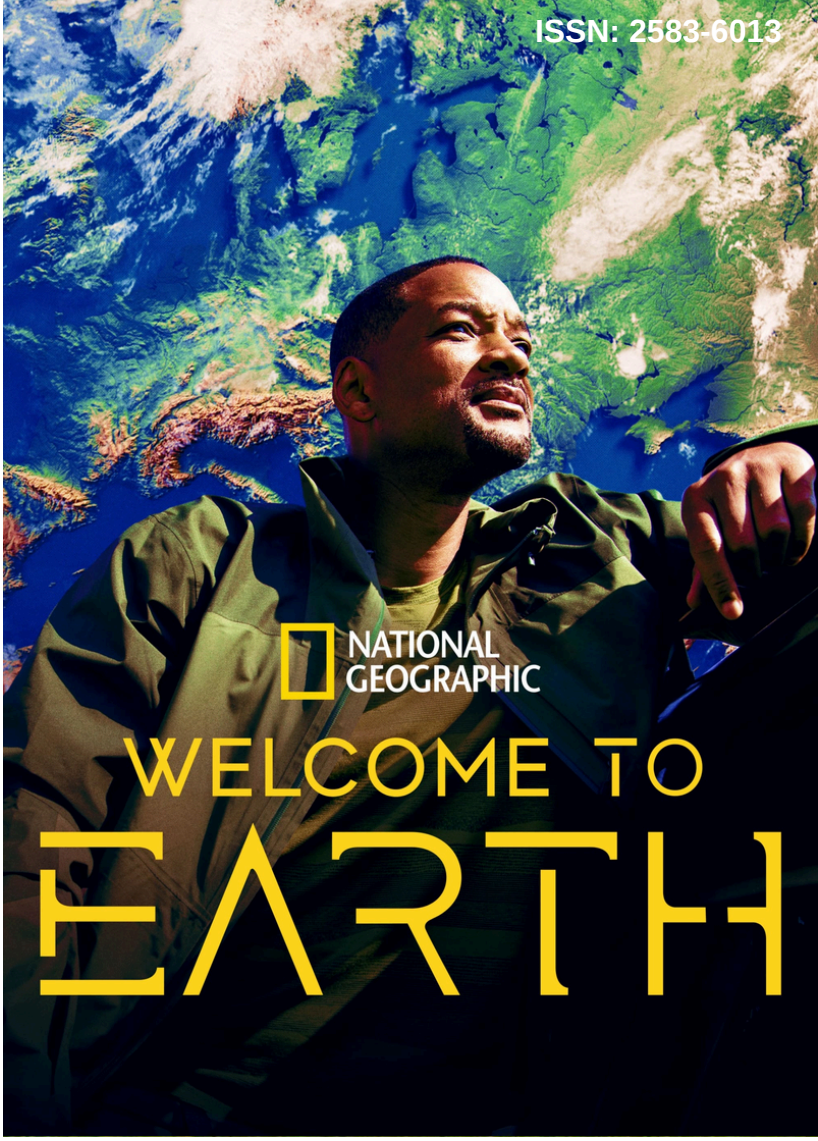
MOVIE RECOMMENDATION

WELCOME TO EARTH



Welcome to Earth is a television series that follows actor Will Smith, as he sets out to offer an insight into some of the world's most remote and uncharted locations. The program debuted as a Disney+ Original on the 8th December 2021, under the National Geographic banner, with all six episodes airing at once. The title is a reference to a line of dialog spoken by Smith as the character, Captain Steven Hiller, in the film Independence Day.

PLOT SYNOPSIS

"Welcome to Earth" is an exhilarating documentary series featuring acclaimed actor Will Smith as he embarks on a captivating global adventure to explore the wonders of our planet. Each episode transports viewers to extraordinary and often remote locations, showcasing breathtaking landscapes and the incredible diversity of ecosystems that make Earth unique.

Through stunning visuals and immersive storytelling, the series reveals the intricate beauty of nature, from lush rainforests and majestic mountains to vibrant coral reefs and expansive deserts. As Smith journeys through these awe-inspiring environments, he highlights the spectacular sights and the remarkable wildlife inhabiting these areas, illustrating the delicate balance of life within each ecosystem.

Engaging with local experts, scientists, and indigenous communities, Smith uncovers the cultural and environmental significance of each destination. Their insights provide viewers with a deeper understanding of the challenges these unique environments face, including climate change and human impact. The series thoughtfully addresses these pressing issues while fostering a sense of hope and possibility, urging viewers to reflect on their roles in conservation.

"Welcome to Earth" combines humor, genuine curiosity, and heartfelt reflection, making it both an entertaining adventure and an educational journey. It emphasizes the interconnectedness of all living beings and the critical importance of protecting our planet, inspiring viewers to appreciate the natural world and recognize their shared responsibility to safeguard its beauty and biodiversity for future generations.

Ultimately, the series serves as a poignant reminder of our planet's awe-inspiring beauty and the urgent call to action to protect it. By igniting a passion for exploration and conservation, "Welcome to Earth" encourages viewers to cherish and preserve the incredible world we inhabit.

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