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Invisible Invasion: Understanding and Tackling Microplastic Pollution

> Imagine a particle so small you can't see it, yet so universal it's everywhere.



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From the Editor's Desk

Dear readers,

As we reflect on the profound transformations in our daily lives, it's impossible to ignore the omnipresence of plastic in nearly every aspect of modern living. Decades ago, our grandparents would carry groceries in cloth bags, store food in steel containers, and sip beverages from Kulhads. Today, plastic has seamlessly woven itself into these simple, everyday routines—grocery bags, food packaging, and disposable cups—offering convenience at an unseen cost.

This transition, which seemed so subtle and beneficial at the time, has now led us to a new global challenge: microplastic pollution. Tiny, invisible fragments of plastic are now embedded in our ecosystems, our oceans, and even our bodies. A ray of hope in the fight against marine pollution could be offered by microorganisms, like the fungus, recently discovered by German scientists, that consumes plastic.

In this issue, we dive deep into the scope of this urgent environmental concern. We will uncover the pervasive spread of these pollutants and the alarming ways they have infiltrated our natural world including marine ecosystems. Further, we will explore emerging innovations aimed at mitigating this problem, offering hope that science can play a crucial role in turning the tide. We will also discuss whether is it even feasible to eliminate plastic altogether.

This issue of our magazine is a call to not only recognize the magnitude of the plastic problem but also to take action—whether through policy, innovation, or personal lifestyle changes. The convenience plastic offers comes at a price, and it's time we start paying attention.

Happy Learning.

Team VisionIAS

We welcome and encourage your feedback, suggestions, and queries. Your input is invaluable to us as we strive to enhance our content and better serve our readers. Please feel free to reach out to us via email at: theplanet@visionias.in.

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COVER STORIES

Invisible Invasion: Understanding and Tackling Microplastic Pollution



Invisible threat of microplastics infiltrating our oceans, ecosystems, and human bodies

Imagine a particle so small you can't see it, yet so universal it's everywhere. A particle that's disrupting ecosystems, infiltrating food chains, and redefining what it means to be human. No, it's not the latest Silicon Valley invention – it's microplastics, and we're all unwitting investors. Since the mid-20th century, plastic has revolutionised our lives, offering unprecedented convenience and durability. From food packaging to synthetic fabrics, plastics have become integral to modern living. However, as we progress through the 21st century, we're uncovering the hidden costs of this convenience—a price paid not just by our environment, but by our bodies. As we grapple with this invisible invasion, we need to confront a sobering reality where we realise that plastic which once promised to make our lives easier is now posing unprecedented challenges to our health and our planet.

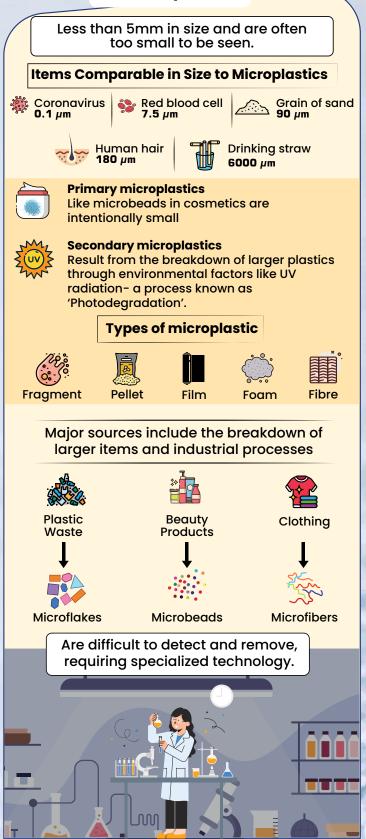
Unraveling the Mystery of Microplastics

To understand the scope of the problem, let's zoom in on what microplastics are and how they compare to normal plastics. The most concerning aspect of microplastic pollution, apart from difficulties in detection, is their universal presence.

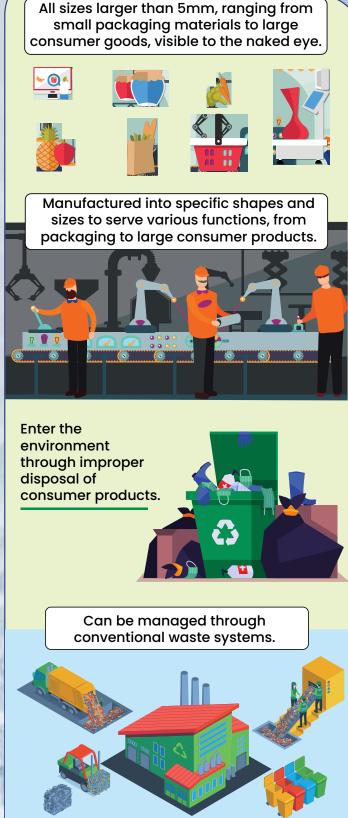


Microplastics vs. Regular Plastics: What Sets Them Apart?

Microplastics



Normal Plastics



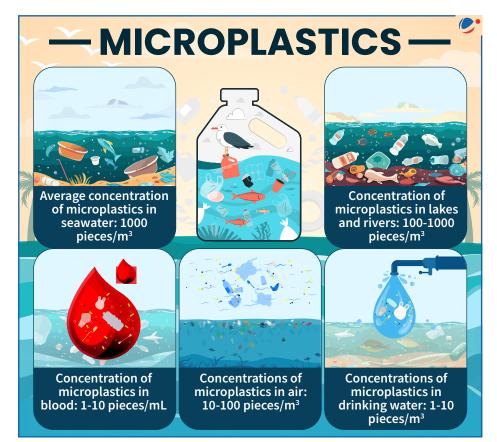
Universal distribution of Microplastic

A 2020 study published in The Cryosphere found microplastics in Antarctic snow, with an average of 29 particles per litre of melted snow. This discovery in one of Earth's most pristine environments underscores the global reach of plastic pollution. Similarly, a study by the CSIR-National Institute of Oceanography (NIO) in Goa found significant microplastic pollution along the Eastern Arabian Sea coast, including Mumbai, Goa, Mangaluru, Calicut, and Kochi. The study revealed varying concentrations of microplastics across locations. For example, Mumbai had 1,600-4,000 particles per kg dry weight, while Goa had 700-2,800 particles.

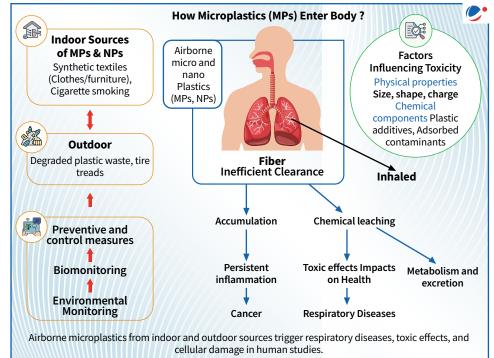
The most alarming discovery is the presence of microplastics in human tissues. Recent studies have detected microplastics in human blood, placenta, and even in the lungs and hearts of living people. The study found microplastics in 17 out of 22 samples of human blood, with PET plastic, commonly used in drink bottles, being the most prevalent type. Surprisingly, researchers have also discovered microplastics in human brain tissue. The study, which is still undergoing peer review, found plastic in human brains at a concentration of 4,800 micrograms per gram. This translates to approximately 0.5% of the brain's weight being composed of plastic. The discovery of microplastics in human blood and brain tissue has opened up a Pandora's box of potential health issues. While research is still in its early stages, several concerns have emerged that link the presence of microplastics to various health problems.

Microplastics in Our Systems: Unseen Health Hazards

Respiratory issues are a primary concern. A 2021 study found that airborne microplastics can cause lung inflammation, potentially leading to chronic respiratory diseases.



The study, which is still undergoing peer review, found plastic in human brains at a concentration of 4,800 micrograms per gram. The study showed that even low concentrations of polystyrene microplastics could trigger harmful responses in human lung cells. Given that 68,000 microplastic particles are inhaled by humans annually, this is a cause for concern.



Metabolic disorders are another potential consequence of microplastic exposure. A 2019 study found that mice exposed to microplastics changes in their gut showed bacteria and metabolic function, including weight gain and altered fat metabolism. These findings highlight the urgent need for further research and action to address microplastic pollution, particularly in densely populated countries like India, where plastic pollution is high due to inadequate waste management infrastructure. These particles can carry pollutants and pathogens, potentially exacerbating respiratory issues in both humans and animals. As microplastic pollution continues to be discovered, it becomes clear that this is not just a human health issue but a global ecological crisis.

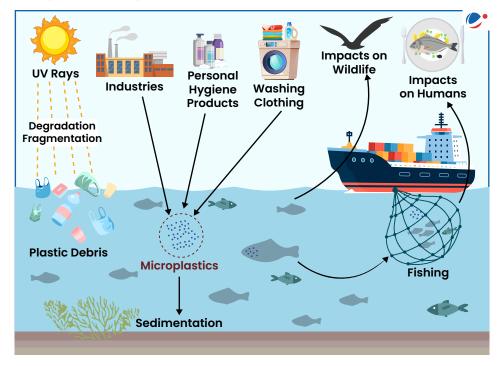
Environmental Impact

Microplastics pose a significant threat to ecosystems, particularly marine ecosystems. Ingestion by marine life disrupts food chains and potentially leads to species population declines. A 2020 study revealed that 100% of sea turtles had ingested microplastics, highlighting the urgent need for sustainable practices. Furthermore, microplastics disrupt marine food chains when tiny organisms like plankton ingest them. This can lead to increased concentrations of plastic particles in larger animals that eat these smaller organisms.

A 2020 study revealed that 100% of sea turtles had ingested microplastics, highlighting the urgent need for sustainable practices.

The omnipresence of microplastics raises concerns about their potential to act as vectors for other pollutants, adsorbing and concentrating toxic chemicals from the environment, and potentially transporting pollutants to new areas or organisms.

Moreover, terrestrial ecosystems are not immune to the effects of microplastics. Microplastics, found in soil, can alter microbial communities, impacting plant growth and nutrient cycling, and threaten biodiversity. As microplastics accumulate. they affect soil and water quality, altering habitats and potentially exacerbating health issues in



humans and animals. In a similar vein, airborne microplastics can carry pollutants and pathogens, potentially accelerating climate change by affecting atmospheric processes. As the pervasive threat of microplastic pollution becomes increasingly apparent, nations and organizations worldwide are mobilizing to combat this environmental crisis.

Global and Local Responses

From legislative measures to innovative research, countries are adopting multifaceted approaches to address this complex issue.



India has emerged as a key player in the fight against microplastic pollution. In 2022, India implemented a nationwide ban on specific singleuse plastic items, targeting the reduction of plastic waste. This ban covers items such as earbuds, balloon sticks, candy sticks, ice-cream sticks, and polystyrene for decoration, affecting approximately 100 singleuse plastic items. In the 4th United Nations Environment Assembly held in 2019. India also piloted a resolution on addressing single-use plastic product pollution, acknowledging the critical need for the global community to focus on this issue.

India isn't alone in this fight. The European Union implemented the Single-Use Plastics Directive in 2021 to reduce plastic pollution by banning certain items and setting collection targets. The directive aims to collect 90% of plastic bottles by 2029 and ensure at least 25% recycled content by 2025. Rwanda has also set a commendable example by banning plastic bags since 2008, leading to Kigali being cited as one of the cleanest cities in Africa. At least 30 African countries have passed laws

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The UN Environment Assembly adopted a resolution in 2022 to end plastic pollution, including microplastics, by developing a legally binding instrument by 2024.

to curb plastic bag use.

At the international level, in a historic move, the UN Environment Assembly adopted a resolution in 2022 to end plastic pollution, including microplastics, by developing a legally binding instrument by 2024. The treaty, supported by 175 countries, aims to address the full lifecycle of plastics, from production to disposal. It is expected to be finalized by November 2024 with the final intergovernmental negotiation meeting taking place in Busan, South Korea. The instrument once in force will have significant implications for plastic production and waste management globally. It is evident that the fight against microplastic pollution demands a comprehensive strategy involving individuals, industries, and governments.

Call to Action

As Mahatma Gandhi wisely noted, "The world has enough for everyone's need, but not enough for everyone's greed" - a sentiment that resonates strongly in our plastic-dominated world. Scientific innovation is paving the way for sustainable solutions, with researchers at the University of Cambridge developing a polymer film from plant proteins that rivals the strength of fossil fuel-based plastics. Chemical technologies are also breaking new ground in recycling, with companies like Loop Industries depolymerizing low-value plastics into high-purity monomers. Detection methods like the fluorescent dye technique developed by University of Adelaide researchers can help in handling the ever-growing waste. Policy measures like Extended Producer Responsibility (EPR) schemes are showing promise, with Japan's EPR system for packaging achieving recycling rates of up to 85% for some materials.

Most importantly, a fundamental shift in consumer behaviour is needed, with 73% of global consumers willing to change their habits for environmental reasons. As individuals, we must focus on how to reduce microplastic pollution. Reducing single-use plastic consumption, choosing products with minimal packaging, supporting businesses committed to sustainable practices, participating in local cleanup initiatives, and educating others about the impact of microplastics are some minimal steps that can pave the path for a microplastic-free future. By taking action at all levels - from individual choices to global policies - we can work towards a future where plastic convenience doesn't compromise our health and environment. Every small step counts in this crucial fight against microplastic pollution.

As Mahatma Gandhi noted, "The world has enough for everyone's need, but not enough for everyone's greed" - a sentiment that resonates strongly in our plastic-dominated world.

Understanding our choices, from clothing to products, can help reduce our plastic footprint, and global cooperation is crucial for tackling the microplastic problem.

Economics of Plastic: Global Policy Dilemma



Reconciling the economic benefits of plastic with sustainability underscore the financial stakes of the global plastic challenge.

durability, and adaptability, have made it an

essential material in sectors ranging from

agriculture and construction to electronics.

healthcare, and renewable energy.

In the mid-20th century, plastic was seen as an economic saviour. Cheap to produce and versatile, it fuelled consumerism and innovation. Early marketing campaigns showcased plastic's potential to transform daily life, from food storage to fashion. For decades, it seemed like plastic could solve any problem, from making cars more fuel-efficient to providing affordable packaging for

the masses. But as plastic became more pervasive, so **became more pervasive, so became more pervasive, so became more pervasive, so became more per**

Today, plastic is everywhere. From the toys children play with, to the packaging of food items, to the very infrastructure of renewable energy sources like wind turbines and solar panels,

plastic is deeply embedded in our lives. It's hard to imagine a world without it. But that's precisely the dilemma we face: how do we reconcile our dependence on plastic with the growing environmental catastrophe it has unleashed?

Plastic: An Economic Cornerstone

The rise in global demand for plastic has been particularly driven by polyethylene, a derivative of ethylene, which is used in a wide variety of products. Polyethylene's properties, such as its strength, durability, and adaptability, have made it an essential material in sectors ranging from

> agriculture and construction to electronics, healthcare, and renewable energy.

Take, for example, the innovation in medical technology. Highdensity polyethylene is now used in bone joint replacements, effectively replacing steel in some cases due to its strength and flexibility. Without plastic,

>>

advancements like these would be slower and more expensive, making healthcare less accessible. Similarly, whether it's making cars lighter and more fuel-efficient or enabling breakthroughs in clean energy technology, plastic has become central to industrial and technological progress. Efforts to completely phase out plastic entirely seem unrealistic, as its diverse applications make it irreplaceable for now. However, this reliance comes with significant environmental costs.

Environmental Cost

The environmental impact of plastic is staggering. Every year, approximately 275 million tons of plastic are produced, and an estimated 8 million tons of this waste end up in the oceans. Further, microplastics have been found in virtually everything from water supplies to food chains, posing new threats to health and sustainability.

An important marker of environmental cost of plastic is the concept of Plastic Overshoot Day (an initiative by Earth Action, a Swiss not-for-profit organization) which refers to the day in a calendar year when annual global plastic waste surpasses the world's waste management capacity. In 2024, September 05 marked the Plastic Overshoot Day highlighting significant gaps in local plastic waste management capacities across the globe.

The disconnect between the economic and environmental costs of plastic is stark. Plastic products remain cheap because their environmental damage is not accounted for in the market price. The dilemma lies in determining who should bear the environmental costs and how policies across the globe can regulate plastic use in a way that aligns with economic realities.

Global Policy responses: Fragmented and Inconsistent

Despite widespread awareness of the plastic waste crisis, global policy responses have been fragmented and inconsistent. In the European Union, for instance, there are stringent regulations banning certain single-use plastics, while other nations, like the United States and Australia, focus more on recycling initiatives. Meanwhile, countries like India have imposed complete ban on Single Use Plastic in 2022 and also regulate other plastic items based on their thickness.

However, these varied approaches create complications for global trade and businesses. Multinational corporations face the challenge of navigating different regulatory landscapes, which complicates efforts to establish global supply chains in compliance with all regulations. Additionally, developing countries with less waste management infrastructure often rely on informal recycling sectors that lack regulation, further exacerbating the plastic waste issue.

Can Extended Producer Responsibility help?

One approach gaining traction is Extended Producer Responsibility (EPR) based on the 'Polluter Pays' principle. It holds manufacturers accountable for the entire lifecycle of their plastic products. EPR shifts the burden of waste management from consumers and governments to the producers, incentivizing companies to design more recyclable or sustainable products.

While EPR shows promise, its implementation, especially in developing countries, remains a challenge. These nations often lack the infrastructure to enforce regulations or manage the necessary recycling processes. Success will require global cooperation, government support, and significant investment in waste management infrastructure.

Economic Risks of Regulation

Although aggressive regulations on plastic can yield environmental benefits, they also pose economic risks. Bans on single-use plastics, for example, can impact industries reliant on cheap packaging materials. These industries may face higher costs as they switch to alternatives such as paper, glass, or biodegradable plastics, which are often more expensive to produce.

In regions where plastic manufacturing is a key economic sector, such as parts of Southeast Asia due to rapid urbanization, stringent regulations could lead to job losses and reduced economic growth. Therefore, policies must strike a balance between environmental protection and economic sustainability. A phased approach, allowing industries time to adapt to alternative materials and technologies, is critical to avoiding these economic pitfalls.

Plastic has been both a blessing and a curse, driving economic growth while leaving a trail of environmental destruction. As we look toward to the future, it's clear that business as usual is no longer an option. Governments, corporations, and consumers must come together to reimagine our relationship with plastic. The choices we make today will determine whether plastic remains a valuable asset or an overwhelming burden for generations to come.

The economic stakes are high, but the environmental stakes are even higher. The solution will neither be found in the extreme of banning all plastic, nor in doing nothing. Instead, it lies in innovation, collaboration, and a rethinking of how we produce, use, and dispose-off plastic.

Snapshot Timeless Dance of NEELAKURINJU ABLOOMING MYSTERY

Every 12 years, some parts of India transform into a sea of purplish-blue as millions of Neelakurinji flowers burst into bloom. This plant has recently been added to the IUCN's (International Union for Conservation of Nature) official Red List of Threatened Species, highlighting the essential need for conservation efforts to safeguard this species.



NEELAKURINJI DISTRIBUTION

C • Where to visit to experience the rare blooms?

Neelakurinji is found in India, specifically in the Western Ghats and Eastern Ghats.

It is found in the shola forests of Kerala, Karnataka, and Tamil Nadu, as well as in the Nilgiri hills and Eravikulam hills of Munnar.



The Neelakurinji's story dates back over 2,000 years, featuring prominently in ancient Tamil literature.

The Planet Vision August, 2024 by Vision IA

This verse in a book of Sangam poetry, translated by AK Ramanujan, originally written 2000 years ago depicts the significance of Neelakurinji in the Indian culture.

Bigger than Earth, certainly Higher than the sky More unfathomable than the waters Is this love for this man Of the mountain slopes Where the bees make rich honey From the flowers of the Kurinji That has such black stalks



Neelakurinji holds a secret in its name. In Malayalam 'neela' means blue, and kurinji' refers to the flowers. These flowers give the Nilgiri Mountain range its name. At maturity, the light blue color of flowers changes to purple bluish.

But it wasn't until 1858 that scientists first wrote it down in their books and was officially documented and classified as Strobilanthes kunthiana.

British botanist Robert Wight initially studied the plant, identifying over 20 species and eventually documenting 250 with unique characteristics and unique life cycles.

Nature's Alarm Clock 🥏

Scientists marvel at the synchronized blooming of Neelakurinji, a process known as "masting." This evolutionary strategy ensures abundant seed production and increased chances of survival.

Tale of Survival 🥭

Despite its resilience, Neelakurinji faces significant threats due to its fragile montane high-altitude grasslands habitat, which is under pressure from tea and softwood plantations and urbanization.

C. Ecological Significance

Neelakurinji plays a crucial role in its ecosystem, supporting various pollinators and wildlife.

Its mass blooming event creates a temporary but vital food source for numerous species, highlighting the intricate connections within nature.

As we look forward to the next blooming in 2030, the story of Neelakurinji serves as a reminder of nature's wonders and our responsibility to preserve them.

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From Legislation to Action: Assessing India's Single-Use Plastic Ban



One of the main sources of microplastic contamination is single-use plastic products. Source: UNEP

During Independence Day speech in 2019, Prime Minister Narendra Modi put forth an important question- 'Can we free India from single-use plastic?'. A 'single-use plasticfree India'- seems like an impossible dream, but India was already on its path towards this green vision. On June 5, 2018, to mark World Environment Day, India took a bold step and announced that India would phase out singleuse plastics by 2022. Three years later, on August 12, 2021, a ban on certain identified single-use plastic items, with low utility and high littering potential, was notified which came into force on July 1, 2022. Manufacturing, sale and use of items like products containing plastic sticks, plastic cutlery and wrapping was prohibited following the ban. So, what led India to make such a daring yet inspiring move?

Confronting Plastic Crisis: Need for Ban on SUPs in India

When plastic, cheap, convenient, and seemingly harmless, first entered the Indian market it spread like wildfire. In India, one could find single-use plastics (SUPs)

like plastic bags, straws and bottles in every nook and corner. But the convenience it offered, came with a heavy price. In recent years, single-use plastics (SUPs) have become a global menace, wreaking havoc on ecosystems, wildlife, and human health.

On August 12, 2021, a ban on certain identified single-use plastic items, with low utility and high littering potential, was notified which came into force on July 1, 2022.

India generates approximately 5.5 MMT (million metric tonnes) of plastic waste annually and is the world's thirdlargest producer of SUP waste items designed to be used once and discarded. Given their lightweight, disposable nature, these plastics often end up in landfills, rivers, and oceans, where they persist for centuries, contaminating ecosystems and harming wildlife.

The detrimental impact of SUP on the environment is well-documented. From choked rivers to clogged drainage systems, India has long grappled with the consequences of plastic pollution. The country's growing urbanization, coupled with changing consumption patterns, exacerbated the problem. The SUP ban was a leap in the direction of overcoming India's growing plastic problem. Several measures were taken to ensure the ban was enforced in its spirit.

From Promise to Practice: India's Efforts to Eliminate Single-Use Plastics

In 2022, Guidelines on Extended Producers Responsibility (EPR) on plastic packaging as Plastic Waste Management Amendment Rules were announced by the Ministry of Environment, Forest and Climate Change. An EPR is a producer's duty to ensure the product is handled in an eco-friendly manner from the time it is manufactured until it is no longer needed.

To support the transition away from SUPs, MSMEs are receiving assistance, and eco-friendly alternatives are being promoted through national expos and startup initiatives

Along with the prohibition came specific enforcement teams and control rooms at both the national and state levels to monitor the illicit production, sale, and consumption of the forbidden single-use plastics. Directives have been issued to manufacturers to halt raw material supplies for banned plastics, State Pollution Control Board to revoke licenses, and Customs to stop imports of such items. Digital tools like the National Dashboard and Central Pollution Control Board Monitoring Module are tracking compliance.

To support the transition away from SUPs, MSMEs are receiving assistance, and eco-friendly alternatives are being promoted through national expos and startup initiatives. The PRAKRITI mascot was also launched to raise awareness among consumers. These combined efforts aim to ensure effective enforcement of the SUP ban and foster a shift towards sustainable practices across industries and communities. So how successful has the ban been?

Assessing Progress: Impact and Challenges of India's Nationwide Single-Use Plastic Ban

According to a survey by the Centre for Science and Environment, about 53.9 per cent of the respondents reported that they had seen some positive changes in their community since SUP ban was implemented. Of



Photo Credit: European Parliament/Flickr.com

the total respondents, 94.9 per cent said they had taken steps towards reducing their usage of the banned SUP items.

The ban has sparked a surge in innovation, as entrepreneurs and startups are busy creating ecofriendly alternatives: edible spoons, bags made of jute, and packaging materials that dissolve in water. In short, the ban has transformed waste into opportunity.



PRAKRITI mascot Source: Mission LiFE Website

However, the challenge of implementing a ban in a country as vast and varied as India is monumental. Lax supervision and reluctance across cost-sensitive small businesses to adopt alternatives have been an issue. The ban, while ambitious, has not entirely solved the deeper

issue of how India handles its waste. Many communities are still grappling with inadequate resources to properly manage plastic disposal.

Path to a Plastic-Free India: Innovative Strategies and Global Inspirations

To effectively transition away from SUPs, India must strategically invest in alternative markets by introducing subsidies and reduced tax rates for eco-friendly substitutes. This will drive innovation and economic growth in green sectors. Enhancing the capacity of enforcement officials is also essential. Comprehensive training on inspection techniques and equipping teams with necessary tools will bolster compliance monitoring. Also, Transparency is crucial for building trust. Hence, mandating regular reporting on enforcement actions, such as fines levied and units shut down, along with quarterly updates on State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs) websites, will keep stakeholders informed and engaged.

Finally, India's fight against plastic pollution is not just

about banning a product – it's about inspiring a cultural shift and reimagining how we live, consume, and protect the planet for future generations. As beautifully put by Prime Minister Narendra Modi "It is the duty of each one of us, to ensure that the quest for material prosperity does not compromise our environment. The choices that we make today, will define our collective future. The choices may not be easy. But through awareness, technology, and a genuine global partnership, I am sure we can make the right choices. Let us all join together to beat plastic pollution and make this planet a better place to live."

India's fight against plastic pollution is not just about banning a product – it's about inspiring a cultural shift and reimagining how we live, consume, and protect the planet for future generations

As India's plastic-free journey continues, one thing is certain: the country's pioneering efforts have set a powerful example for the world. It's not just a ban; it's a battle cry for a cleaner, greener tomorrow. And though the path is long and winding, it's a future worth fighting for.



Marine Pollution-Great Pacific Garbage Patch



Marine debris, including plastics, paper, wood, metal and other manufactured material is found in the Ocean. Source: UN

You must have read about the Samudra Manthan. In this tug-of-war, the Devas (gods) and Asuras (demons) churned the ocean under Lord Vishnu's aegis to produce the divine elixir of immortality (Amruta). All kinds of

herbs were thrown into the ocean, and many creatures and objects emerged from it, which were then divided between asuras and devas. During this, a pot of lethal poison emerged from the ocean. It was so toxic that it could have destroyed the entire creation. Lord Shiva consumed the poison to save the world. In the present times, oceans are poisoned by marine pollution but who will save the world this time?

Marine pollution is any detrimental alteration of the marine environment caused by the intentional or accidental release of dangerous or toxic substances, such as industrial, commercial and urban wastewater. In recent times, plastic has become the largest contributor to marine pollution. These substances have accumulated over time creating garbage patches in the oceans.

What is the Great Pacific Garbage Patch (GPGP)?

It is a large area in the North Pacific Ocean where marine debris, mostly plastics, has accumulated due to ocean



Location of Great Pacific Garbage Patch. Source: National Oceanic and Atmospheric Administration (NOAA)

currents. Captain Charles Moore discovered it in 1997 while sailing back from a yacht race.

The current Great Pacific Garbage Patch is divided into two areas: the Western Garbage Patch, near Japan, and the Eastern Garbage Patch, between Hawaii and California. The garbage patch is not a visible island of trash, as some may believe. Instead, it is a dispersed collection of plastic particles, known as microplastics, which are difficult to detect with the naked eye. Even oversized plastic items are also found in the garbage patch.

Sources of Marine Pollution

Marine litter originates from many sources and together with the slow rate of degradation, there is a gradual increase in marine litter in the ocean. About eighty per cent of pollution to the marine environment comes from the land. One of the biggest sources is called non-point source pollution, which occurs as a result of runoff. Nonpoint sources of pollution include many small sources, like septic tanks, cars, trucks, and boats, plus larger sources, such as farms, ranches, and forest areas.

Ocean-based sources, such as, overboard discharges from ships and discarded fishing gear, account for the other twenty per cent. Air pollution and dust storms also contribute to marine pollution.

Plastic pollution and its impact on marine biodiversity

Plastic trash harms marine biodiversity irreversibly affecting fish, birds, and mammals. Of the 267 species known to have been affected by marine plastic pollution, 86 per cent are sea turtles, 44 per cent are seabirds, and

Of the 267 species known to have been affected by marine plastic pollution, 86 per cent are sea turtles, 44 per cent are seabirds, and 43 per cent are marine mammals.



Floating facemask in the Ocean. Source: UN

43 per cent are marine mammals. Deadly effects include ingesting, malnutrition, suffocation, infection, drowning, and entanglement.

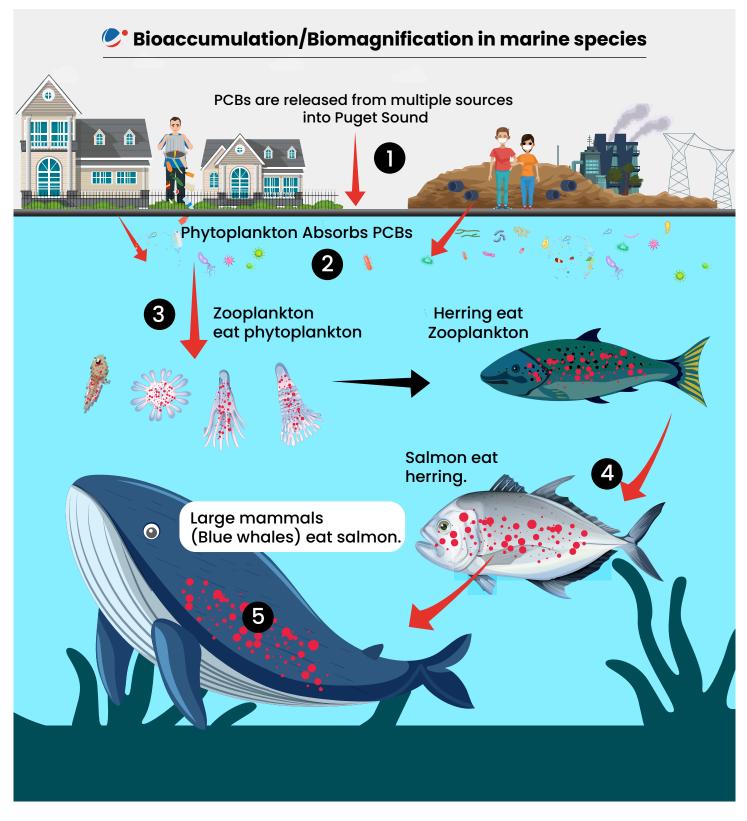
Plastic bags resemble jellyfish, a common food for sea turtles, while some seabirds eat plastic because it releases a chemical that makes it smell like natural food. A California grey whale was found dead in 2010 on the Puget Sound shores. According to the autopsies, it had a golf ball, pants, over 20 plastic bags, little towels, duct tape, and surgical gloves in its belly.

How to fix this?

Many national laws, as well as international agreements, now forbid the dumping of harmful materials into the ocean, although enforcing these regulations remains a challenge. According to a 2018 report from the United Nations, more than sixty countries have enacted regulations to limit or ban the use of disposable plastic items.

Addressing the issue of plastic pollution and marine litter has become an urgent global imperative, demanding concerted efforts from individuals, communities, and governments worldwide. There is a need to change society's approach to plastic use. Currently from shopping bags to shipping packaging to plastic bottles, it is common in everyone's life.

The Great Pacific Garbage Patch is a large area in the North Pacific Ocean where plastic debris accumulates. The article outlines the sources of marine pollution, its devastating impact on marine life, and emphasizes the urgent need for global action to address plastic pollution through regulations and changes in societal approach to plastic use.



It is very common to find warning signs near rivers which say that do not eat the fish from rivers/ponds due to contamination. This is due to the presence of toxic materials such as mercury, plastic, etc. It is being increased due to bioaccumulation and biomagnification.

Bioaccumulation and biomagnification are two different processes that often occur in tandem with one another.

Bioaccumulation is the process by which toxins enter the food web by building up in individual organisms, while biomagnification is the process by which toxins are passed from one trophic level to the next (and thereby increase in concentration) within a food web. This is being showcased by Polychlorinated Biphenyls (PCB) in the marine food chain in the image.

India

India Launches Green Tug Transition Program to Decarbonise Maritime Sector



Shri Sarbananda Sonowal launched GTTP Source: PIB

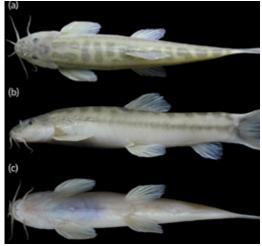
Union Minister Shri Sarbananda Sonowal launched the Green Tug Transition Program (GTTP) to promote sustainable maritime practices in India. Starting October 2024, Phase 1 of the program will replace diesel-powered harbour tugs with zero-emission alternatives across four major ports. This initiative, expected to require an investment of INR 1000 crores, will incorporate emerging green technologies such as battery-electric, hybrid, methanol, and green hydrogen.

The GTTP aligns with India's 'Make in India' and Maritime Vision 2030 strategies, aiming to decarbonize port operations. By 2040, all tugs in Indian ports will be eco-friendly, significantly reducing carbon emissions, supporting the country's environmental goals, and enhancing domestic shipbuilding and employment.

New Cave-Dwelling Fish Discovered in Meghalaya's Limestone Caves

Scientists recently discovered a new species of cave-dwelling loach, Schistura sonarengaensis, in three limestone caves—Krem Sonarenga, Krem Nakama, and Krem Chiabole—in Meghalaya's South Garo Hills district. Named after the Krem Sonarenga cave, where the first specimens were collected, the fish features prominent eyes and 13-26 black blotches on a greyish-black stripe over a pale-beige body. The discovery, led by scientists from the ICAR-National Bureau of Fish Genetic Resources and Gauhati University, was published in the Journal of Fish Biology.

The species is unique among other Schistura species in the region and reinforces the importance of scientific expeditions in Meghalaya's caves. This finding suggests that further exploration could reveal more undiscovered biodiversity, vital for future conservation strategies.



Schistura sonarengaensis Source: Indian Council of Agricultural Research (ICAR) - National Bureau of Fish Genetic Resources

Chhattisgarh Approves Country's Third Largest Tiger Reserve



Approval for tiger reserve to boost its population Source: WWF

Chhattisgarh has approved the creation of the Guru Ghasidas-Tamor Pingla Tiger Reserve, formed by integrating Guru Ghasidas National Park and Tamor Pingla Sanctuary, covering 2,829 square kilometres. This will be the state's fourth tiger reserve, joining Indravati, Udanti-Sitanadi, and Achanakmar. The reserve

is now the third-largest in the country, following Andhra Pradesh's Nagarjunsagar Srisailam and Assam's Manas reserves. The move comes as Chhattisgarh's tiger population plummeted from 46 in 2014 to 17 in 2022.

The new reserve aims to boost eco-tourism and create employment for locals in the core and buffer zones. Additionally, the National Project Tiger Authority will allocate extra funds for the reserve's operations, supporting local livelihood projects and strengthening wildlife conservation efforts.

NGT Pushes for Eco-Sensitive Zone Declaration



NGT urges MoEFCC to declare Western Ghats as an eco-sensitive zone Source: National Green Tribunal

The National Green Tribunal (NGT) has urged the Ministry of Environment, Forests, and Climate Change (MoEFCC) to set a deadline for declaring the Western Ghats an ecosensitive zone (ESZ). The Western Ghats, India's second most landslide-prone region, lack ESZ protection, allowing harmful activities to continue. An ESZ is an area with unique environmental resources that need special conservation due to their biodiversity, wildlife, and historical significance.

In July 2022, the MoEFCC issued a draft notification to protect the region's biodiversity, proposing restrictions on activities like mining and hydropower. However, delays in finalizing the ESZ status have raised concerns, especially after a case related to construction in Bramhagiri Hills prompted the NGT to push for swift action.

India adds Three New Wetlands to Ramsar List

Union Environment Minister Shri Bhupender Yadav announced the addition of three new wetlands to India's Ramsar sites list, bringing the total to 85. The newly designated sites include Nanjarayan Bird Sanctuary, Kazhuveli Bird Sanctuary in Tamil Nadu, and Tawa Reservoir in Madhya Pradesh. With this, the Ramsar sites now cover an area of 1,358,068 hectares in the country.



Nanjarayan Bird Sanctuary Source: Ramsar Sites Information Service

The inclusion of these wetlands signifies India's commitment to wetlands conservation and sustainable management. Since 2014, India has added 59 sites to the Ramsar list. Tamil Nadu now hosts the highest number of Ramsar sites, followed by Uttar Pradesh. This move strengthens the country's dedication to ecological harmony and biodiversity conservation.

Project Cheetah Faces Challenges After Death of Namibian Cheetah



Namibian Cheetah Source: Kuno National Park Portal

The death of Namibian cheetah Pawan at Kuno National Park (KNP), Madhya Pradesh, has brought attention to the ongoing challenges faced by Project Cheetah. His death leaves KNP with 24 cheetahs, including 12 adults and 12

cubs. Launched in 2022, the project aims to reintroduce cheetahs, sourced from Namibia and South Africa, to Indian grasslands after their extinction. However, difficulties such as prey shortages and biorhythm disruptions have affected the cheetahs' survival. KNP's prey density remains lower than ideal, with 22 individuals per km², against the required 35-40. Additionally, differences in circadian rhythms have caused some cheetahs to develop thick winter coats during Indian summers. To improve cheetah management, Gandhi Sagar and Nauradehi Wildlife Sanctuaries are being considered as alternative habitats.

Global

EU Nature Restoration Law takes effect



EU Nature Restoration Law for Ecosystem Recovery Source: IUCN

The European Union (EU) Nature Restoration Law, the first continent-wide legislation for ecosystem recovery, came into force on August 18. It mandates Member States to restore 20% of degraded ecosystems by 2030 and all those in need by 2050. Nations must develop National Restoration Plans by 2026, detailing steps to restore 30% of terrestrial, coastal, and marine ecosystems, including rewetting agricultural peatlands and increasing urban green spaces.

The law aligns with the EU's climate commitments, enhancing biodiversity and promoting sustainable ecosystem services. It also includes specific targets for improving pollinator biodiversity, freeing rivers, and planting three billion trees by 2030, contributing to broader EU environmental goals. IUCN (International Union for Conservation of Nature) tools will assist in scaling restoration efforts.

UN Chief Urges Pacific Nations to lead Climate Action

At the 2024 Pacific Islands Forum in Tonga, UN Secretary-General António Guterres called on Pacific nations to inspire worldwide climate efforts. He praised the region's bold initiatives, such as declaring a climate emergency and striving for a fossil-fuel-free future. Guterres stressed the Pacific Islands' 2050 Strategy for the Blue Pacific as a global model and urged G20 nations, responsible for most greenhouse gas emissions, to follow suit.

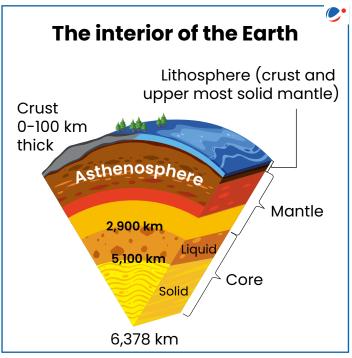


UN Secretary-General António Guterres Source: United Nation's Website

He highlighted the urgency of addressing rising sea levels, ocean warming, and plastic pollution, which are devastating marine ecosystems. Guterres emphasized the need for financial and technological aid to support the Pacific's transition to sustainability, advocating for international financial reform, including debt relief and greater lending for vulnerable regions.

Scientists Drill Deepest Rock Sample from Earth's Mantle

Scientists aboard the US vessel JOIDES Resolution have successfully drilled 1.2 km below the Atlantis Massif, surpassing previous drilling records. The operation, under the International Ocean Discovery Program (IODP), recovered a rock sample containing over 70% mantle material. This sample offers insights into the upper mantle's composition and the interactions between mantle rock and seawater, processes that might have contributed to the origin of life on Earth.



Interior of the Earth

The Atlantis Massif, near the Mid-Atlantic Ridge, provides access to mantle rock, which is typically inaccessible. The discovery allows scientists to study deep-sea chemical reactions, which release compounds like methane, supporting microbial life, potentially linking these findings to early Earth's conditions.

WMO Launches New Project to Enhance Polar Weather Forecasting



Polar weathering Forecasting [Representative Image]

The World Meteorological Organization (WMO) has initiated a project called Polar Coupled Analysis and Prediction for Services (PCAPS), aiming to enhance weather, water, ice, and climate forecasting in the Arctic and Antarctic. The project, running from 2024 to 2028, focuses on improving observation systems and Earth system models to ensure better safety for polar communities. Led by experts from Norway and New Zealand, it is part of WMO's broader efforts to strengthen monitoring and data exchange on the cryosphere.

The project addresses both scientific and societal challenges, especially the impact of climate change on Indigenous populations and local communities. By facilitating collaboration among researchers, service providers, and stakeholders, the project aims to improve forecasting models and offer actionable insights for polar regions, which are crucial to global climate systems.

Northern Bald Ibis Returns to Europe with Human-Led Migration Support



Northern Bald Ibis Source: BirdLife International

Once extinct in Europe, the northern bald ibis, or Waldrapp, has been successfully reintroduced through conservation efforts. While rewilding has revived their population, the birds lack the knowledge to migrate, as they were not raised by wild-born elders. To address this, a team of scientists, acting as foster parents and flight instructors, guide the birds on their migratory path using microlight aircraft.

This year marks the 17th human-led migration, with birds now flying a new route to Spain due to climate change. The project has grown the Central European Ibis population to nearly 300 birds, with hopes of reaching 350 by 2028 and becoming self-sustaining.

Rising Ocean Temperatures Endanger Great Barrier Reef, Study Warns

A study published in Nature reveals that ocean temperatures around the Great Barrier Reef (GBR) have reached their highest levels in 400 years, threatening the world's largest coral reef. Rising sea temperatures, driven by climate change, have caused five mass coral bleaching events between 2016 and 2024, severely impacting the reef's coral colonies. These bleaching events occur when

corals expel symbiotic algae due to heat stress, turning the corals white and leaving them vulnerable.

The study highlights a rapid warming trend since 1900, with a 0.12°C increase per decade from 1960 to 2024. The last few years, particularly from 2023 to 2024, have seen record-breaking temperatures. Scientists emphasize the urgent need for stronger climate action to protect the reef and prevent further damage.



Great Barrier Reef Source: UNESCO





Smart and Effective Notes Making for UPSC CSE Principles and Strategies



Why Notes Making? 🚝

Note-making for the UPSC exam is a strategic tool that significantly enhances an aspirant's ability to understand, retain, and revise the vast curriculum effectively. This personalized study aid helps in breaking down complex topics into digestible pieces, facilitating easier recollection and efficient last-minute revisions.

Principles of Notes Making 📝

- Personalize Notes: Understand your learning style for effective customization which should be prepared in an integrated manner for both Prelims and Mains examination.
- **Format Choice:** Opt for digital, handwritien, or a hybrid approach based on learning ease.
- Summarization and Organization: Condense passages, use bullet points for clear organization.
- **Current Affairs Integration:** Enhance note relevance by integrating current affairs with static topics.
- Language Precision: Emphasize keywords, concepts, and examples; avoid complete sentences.



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Smart Strategies for Effective Notes Making 🛛 🍘

Reliable Sources Choose reputable sources that meet the demands of the examination.

Use diagrams, flowcharts, and mind maps to visualize complex relationships between topics. Summarize and Organize Highlight or underline important points while reading, then summarize these in your own words.

Create a dedicated section and link it to corresponding static topics for a comprehensive understanding. Link to the UPSC Syllabus To ensure easy referencing of subject, topic, and subtopic for efficient exam preparation.

Frequently revisit your notes to reinforce your memory and improve your retention.

ϔ Use bullet points, headings, and subheadings to structure your notes clearly.

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GREEN TECH

Geotextiles: Weaving a Stronger World



Geotextiles are strengthening the foundation of modern infrastructure

Imagine a world where fabrics aren't just for clothing. Picture a world where they can stabilize mountains, filter water, and even help plants grow. This isn't science fiction; it's the realm of geotextiles. These extraordinary materials are engineered to interact with the earth's elements. They're like invisible guardians, protecting our infrastructure, preserving our environment, and even reshaping our landscapes. Let us know more about the geotextiles.

Geotextile: Overview of this Versatile fabric

Geotextiles are incredible materials, woven from synthetic or natural fibers. They're not only permeable, meaning water can flow through them, but are also strong enough to withstand immense pressure.

Think of them as versatile tools that can separate materials, filter substances like sediment, silt, and dirt, reinforce soil, protect infrastructure like storm drain inlets, and facilitate



Geotextile Use in Road Construction

drainage. They're used in everything from roads and dams to landfills and erosion control. And when they're made from natural materials like hemp or coir, they're not just tough, they're also environmentally friendly.

With the growing focus on sustainability, geotextiles made from natural fiber materials such as hemp or coir are becoming a popular choice. They're a sustainable alternative that helps protect our planet while providing the same strength and durability as their synthetic counterparts.

Geotextiles: Material for Sustainable Future

Geotextiles are like invisible superheroes in the world of construction. They are widely used for soil reinforcement in different situations such as slopes and river banks, roads and infrastructure. It improves & stability and decreases the process of wind & water erosion. In recent times, Geotechnical textiles are being increasingly used globally to address dangers to infrastructure caused by degradation and natural disasters.



Coir based Biodegradable Geotextile

Biodegradable geotextiles made up of jute, coir or hemp biodegrade and disappear without generation of microplastics once they have completed their task. It has applications in various fields including agriculture. Geotextiles allow air, water and nutrients to reach plant roots while blocking weeds and aiding seed germination. More on in the process of degradation Biodegradable geotextiles end up generating by-products which are useful for plants' growth. By replacing plastic components in various industries, from construction to waste management, geotextiles can significantly reduce plastic waste.

Geotextiles, also offer a sustainable and innovative solution to the plastic crisis. By replacing plastic components in various industries, from construction to waste management, they can significantly reduce plastic waste and mitigate its harmful environmental impacts. From filtering pollutants to reinforcing landfill liners, geotextiles offer a versatile and effective tool in the fight against plastic pollution. Considering its huge potential and sustainability, the Indian government has been promoting the usage and development of the geotextiles market in India.

India Promoting Geotextiles

It has formulated a Scheme for Promoting Usage of Geotechnical textiles in the North Eastern Region. It has launched the National Technical Textiles Mission and Production Linked Incentive (PLI) scheme to boost the technical textiles market. Ministry of Road Ministry has also issued directions/guidelines on several occasions to promote the use of Geotextiles in road construction.

Geotextiles, the unsung heroes of modern infrastructure, have revolutionized the way we interact with the earth. As technology continues to advance, we can expect even more innovative applications of geotextiles to emerge, shaping a brighter and more resilient future.



Fly Ash in Cold Asphalt Technology: A Sustainable Solution for Road Construction



Fly ash, a byproduct of coal combustion in thermal power plants, has long been a cause of environmental concern due to its hazardous effects on air, water, and soil. The generation of fly ash is massive, with millions of tons produced annually worldwide. However, instead of considering it merely as industrial waste, fly ash has being recognized as a valuable resource in various industries, including construction. One of the most innovative uses of fly ash in recent times is its integration into Cold Asphalt Technology, offering an eco-friendly and cost-effective solution for road construction.

What is Cold Asphalt Technology?

Cold Mix Asphalt Technology refers to the production of asphalt mixture at ambient temperature using bitumen emulsion and foamed bitumen, etc. Unlike traditional hotmix asphalt, cold asphalt technology does not require heating of the aggregate and binder material during the mixing process. This reduces energy consumption significantly and lowers the carbon emissions associated with road construction. The use of cold asphalt mixtures has gained traction due to their environmental benefits, cost savings, and versatility.

Fly ash can play a critical role in this process. In cold asphalt mixtures, it can be used as a mineral filler, replacing

conventional materials such as cement or lime. Fly ash imparts several beneficial properties to the asphalt mix, making it an ideal alternative to more energy-intensive and environmentally damaging materials.

Cold Mix Asphalt technology reduces energy consumption significantly and lowers carbon emissions associated with road construction.

What are the benefits of using Fly Ash in Cold Asphalt?

One of the most significant advantages of using fly ash in cold asphalt technology is its ability to reduce the environmental footprint of road construction. Utilizing fly ash reduces the need for virgin raw materials, minimizing quarrying and mining activities that disrupt ecosystems. Moreover, recycling fly ash, which would otherwise end up in landfills or cause air pollution, mitigates the environmental impact of waste disposal.

Traditional asphalt production involves heating the materials to high temperatures, consuming substantial amounts of energy and releasing greenhouse gases. Cold asphalt technology, on the other hand, operates at ambient temperatures, significantly cutting down on energy usage. The use of fly ash as a filler further reduces the need for other energy-intensive materials like cement, contributing to an overall reduction in the carbon footprint.

Further, fly ash enhances the structural properties of cold asphalt mixtures by filling voids in the aggregate and improving the mixture's workability. This results in a more durable and stable pavement surface, which is resistant to cracking, deformation, and moisture damage. In particular, the pozzolanic properties of fly ash allow it to react with water and lime, forming compounds that strengthen the asphalt mix over time.

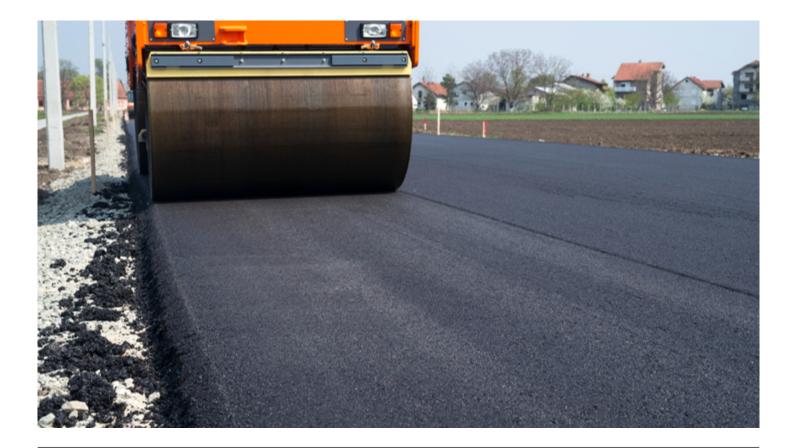
Similarly, cost-effectiveness is another benefit associated with use of fly ash in cold asphalt. Fly ash is a readily available byproduct of thermal power plants, and its use in road construction is often much cheaper than sourcing and processing natural minerals. The reduced energy requirements in cold asphalt production also translate into significant cost savings for construction projects, particularly in remote or resource-scarce areas. Additionally, roads constructed using fly ash-based cold asphalt require less maintenance over time, further reducing long-term costs.

Real-world applications and Case Studies

Countries like India, the United States, and China, which are among the largest producers of fly ash, have initiated pilot projects to utilize fly ash in road construction through cold asphalt technology. One notable example is the use of fly ash in cold asphalt mixtures in construction of rural roads in India. These projects have demonstrated the potential for improved road quality, cost savings, and environmental benefits, leading to greater acceptance of this sustainable construction method.

Use of fly ash in cold asphalt mixtures in construction of rural roads in India have demonstrated the potential for improved road quality, cost savings, and environmental benefits.

Similarly, in parts of the United States, state departments of transportation have begun exploring the use of fly ash in cold asphalt mixes for resurfacing and patchwork operations on highways. These early-stage implementations suggest that cold asphalt technology incorporating fly ash could become a mainstream method in the future for prioritizing sustainable development.





Clouded Leopards

Masters of the Jungle Canopy

Mizoram governor has recently called for protecting rare species of clouded leopard on Clouded Leopard Day (4th August).

Meet the Clouded Leopard!

Quiet, elusive, and mysterious – the clouded leopard is one of nature's best-kept secrets. Found in the dense forests of Southeast Asia, this wild cat is known for its striking coat.

Spot the Clouds?

Their name comes from their large, cloud-shaped spots. Not just for looks – these unique patterns help them blend into the forest, becoming nearly invisible to predators and prey.

Clouded leopards are amazing climbers!

They can hang upside down from trees, thanks to their short legs, powerful muscles, and long tails. Perfect for life up in the treetops!

🥑 Silent Stalker

They are largely nocturnal and highly adept at climbing trees, moving through the jungle with a ghost-like silence, hunting monkeys, deer, and even birds with stealth and precision.

🕑 Adorable Little Hunters 🚽

Clouded leopard cubs are born blind and helpless, but in just a few months, they become fierce little explorers, learning to climb, hunt, and navigate the wild.

🕑 Disappearing Homes

Deforestation in the tropical regions of Southeast Asia is the most serious threat to the clouded leopard. Poaching, illegal wildlife trade & Human-leopard conflict are other threats. Clouded leopard is listed in Schedule I of the Indian Wildlife (Protection) Act, 1972 and is classified 'vulnerable' in IUCN Red List of threatened species.

The clouded leopard is a WWF priority species. WWF treats priority species as one of the most ecologically, economically and/or culturally important species on our planet.



PROTECT AND PRESERVE

Smart Laboratory on Clean Rivers (SLCR) Project

The Smart Laboratory on Clean Rivers (SLCR) Project has been recently established at Varanasi, Uttar Pradesh. It is a unique tripartite initiative between the Government of India (Department of Water Resources, River Development, and Ganga Rejuvenation), the Indian Institute of Technology -

Banaras Hindu University (IIT-BHU), and the Government of Denmark, to bring excellence to small river rejuvenation and management.

SLCR Project aims to leverage the expertise of both nations to rejuvenate the river Varuna using sustainable approaches. Its objectives include creating a collaborative platform for government bodies, knowledge institutions, and local communities to share insights and develop solutions for clean river water.

Under it, a hybrid lab model at the IIT-BHU and an on-field living lab at the Varuna River to test and scale solutions in real-world settings are established. The SLCR has a robust institutional and appraisal mechanism built into it to ensure the necessary due diligence, rigor in its functioning and for ensuring excellence in river management.

Strategic guidance and progress reviews for SLCR will be provided by the Indo-Danish Joint Steering Committee (JSC). The Project Review Committee (PRC) will oversee quality control at the project level. PRC consists of members from the National Mission on Clean Ganga (NMCG), Central



Launch Event of the SLCR Project Source: PIB

SLCR Project aims to leverage the expertise of both nations to rejuvenate the river Varuna using sustainable approaches.

Water Commission (CWC), Central Ground Water Board (CGWB), IIT-BHU, and Denmark's Urban Sector Counsellor. The SLCR Secretariat will receive initial funding of Rs. 16.80 crore from the Ministry of Jal Shakti and an additional 5 crore INR grant from Denmark to support long-term sustainability and project development.

The SLCR is expected to bring out a unique confluence of academia, sub-national, and national Governments working in partnership with another country to co-create solutions for identified problems and issues pertaining to river health in general and small river rejuvenation in particular.

Transforming Wasteyard into Green belt

Recently, Hindustan Zinc Limited has initiated the second phase of the transformation of 16 hectares of wasteland at the Chanderiya Lead-Zinc Smelter (in Rajasthan) into a flourishing greenbelt. The wasteland contains Jarofix which is rich in iron. Jarofix is a residual waste generated during metal extraction from the ore. The project is based on the company's vision- "enhancing biodiversity and protecting natural ecosystems around its operational units".

The company is using an innovative method popularly referred to as Mycorrhiza technology in this project in collaboration with The Energy and Resources Institute (TERI). Mycorrhiza technology fosters a symbiotic relationship between plants and fungi. It allows vegetation to thrive in challenging conditions. It paves the way for a fast-growing,

Mycorrhiza technology fosters a symbiotic relationship between plants and fungi.

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naturally rich ecosystem, resulting in the conversion of wasteland into a thriving, high-density green cover.

This Technology has been also used in the first phase. Under it, 6.25 hectares were successfully transformed, with approximately 11,000 native species planted, creating a high-density green cover. The outcome of the first phase was recognized with the CII National Award for Environmental Best Practices 2021.

Apart from these projects, the Company is implementing Miyawaki plantations across its operational sites to create dense, diverse, and rapidly growing forests in a short period. Moreover, it is the first Indian company to launch a Taskforce on Nature-Related Financial Disclosures (TNFD)



Transformed Site Source: India CSR

report. This aimed at integrating nature-related risks and opportunities into strategic planning.

The company has set up an example by demonstrating how industries can proactively address environmental challenges while contributing to broader sustainability goals.

Khenrig Namsum Cooperative (KNC) – Successfully Rehabilitated fallow land

Khenrig Namsum Cooperative (KNC), a farm cooperative led by farmers and youth in Brumbri village of Zhemgang (Bhutan), has successfully rehabilitated fallow land. The Cooperative took 93 hectares of land on lease which was left fallow over 30 long years due to acute water shortage. The effort of the Cooperative has changed the landscape of the region and ensured prosperity by creating different economic opportunities.

The cooperative began its journey in 2014 with 16 youth members. Today, it has over 230 collaborative farmers from across eight gewogs (a group of villages). The cooperative used Agro-forestry to bring life to the fallow land. Planting trees, shrubs, and hedges on farms can



Mr. Thinley Wangdi, Founder of KNC Source: Bhutan Foundation

give farmers healthier soil and higher yields. In 2016, they cleared close to 80 acres of overgrown land and planted watermelons and bananas. With time, the initiative was extended to cover several acres of land.

The Cooperative received support from the Royal Government project under the Global Environment Facility Small Grants Programme (GEF SGP). GEF SGP aims to "Catalyze and mobilize civil society actors and local actions needed to address major drivers of environmental degradation and help deliver multiple benefits across the GEF's mandated thematic dimensions while promoting sustainable development and improved livelihoods."

Project which was initiated with the watermelons and bananas, now, covers different vegetables, etc. The Cooperative has not only helped in enhancing the income of the farmers but it also helped in reducing the trend of rural-urban migration.

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of the farmers but it also helped in reducing the trend of rural-urban migration.

Global: Quick Hits

Zambia

Zambia plans to shut down the Kariba hydropower plant due to a drying dam, climate change-related droughts, and erratic rainfall, threatening energy supply and water resources.



Zimbabwe

The UN humanitarian coordination agency (OCHA) reports that Zimbabwe's food insecurity is worsening due to record droughts caused by El Niño weather patterns. In April, local authorities in Zimbabwe announced a nationwide state of disaster.



Canada

The Ad Hoc Working Group on Benefit-sharing from the Use of Digital Sequence Information on Genetic Resources met in Montreal, focusing on transparency, database accountability, and equitable distribution. The group was established at the 15th Conference of Parties (COP15) for Convention on Biological Diversity (CBD) in 2022.



Antarctica

Antarctica's record-breaking heatwave, driven by climate change, is causing concerns about its impact on ice sheets, sea levels, and global weather patterns, potentially accelerating glacial melt.



Tanzania

Tanzania has opened a new airstrip in a wildlife park to boost anti-poaching efforts and tourism, despite concerns about human activity's impact on ecosystems and biodiversity.



Russia

The Shiveluch volcano, triggered by a 7.0 magnitude earthquake off Russia's eastern coast, poses significant ecological risks, wildlife threats, and potential environmental ash fallout.

Bangladesh

The devastating monsoon season in Bangladesh has impacted over 18 million people. Major rivers in Chattogram and Sylhet are "flowing well above danger levels," making an already dire situation even worse.

South Korea

South Korea's Constitutional Court ruled climate targets unconstitutional, requiring stricter emission reduction plans for long-term sustainability and effective climate crisis resolution.



New Zealand

New Zealand's government's shift to prioritize polluting sectors for economic recovery may delay climate mitigation efforts and potentially miss its 2030 and 2035 domestic emissions reduction targets.



Mozambique

Mozambique launched an ambitious national roadmap to achieve 'Early Warnings for All' by 2027, aiming to improve disaster preparedness and resilience. The initiative will enhance early warning systems to protect vulnerable communities from the increasing threats of climate-related disasters like cyclones and floods.

DEVELOPMENTS

Wolves Attacks: Revealing the Human-Wildlife Conflict in India



Indian Wolf resides in thorn forests, scrub-lands, arid and semi-arid grassland habitats in India.

Sunita, a mother of Four-year-old Sandhya recalled the night of August 17. Her daughter Sandhya was sleeping outside her mud hut in India's Uttar Pradesh state when a power cut plunged the village into darkness. The wolves attacked within two minutes of the lights off. By the time she realized what was happening, wolves had taken her baby away. Next day, Sandhya's body was found lying in the nearby sugarcane farms. Such attacks have been reported across the Bahraich district in Uttar Pradesh.

This crisis underscores the growing issue of humanwildlife conflict in India, where increased interactions between people and wildlife, often end with tragic results. Let's understand the complex interplay of reasons behind the changing nature of human-wildlife interaction.

Why Are Animals Turning on Humans?

Wolves have long existed in the shadows of pastoralists, preying occasionally on livestock. However, as per some experts, an increase in human encroachment on natural habitats, deforestation, and competition for resources are major contributing factors to the current state of wolf attacks in Bahraich. A part of the Terai region, forests and grasslands here have been rapidly converted to agricultural land. With the ever-increasing human population, natural habitats now lay fragmented and deteriorated, causing animals to enter into human settlements in search of resources like food and water.

However, as per some experts, an increase in human encroachment on natural habitats, deforestation, and competition for resources are major contributing factors to the current state of wolf attacks in Bahraich

Moreover, the loss of natural prey over time due to human intervention and environmental factors has driven wolves out of their homes. Wolves traditionally feed on deer and smaller animals, but when their food supply is disrupted, they resort to hunting whatever they can find.

This dangerous interaction is heightened by poor living conditions. The villagers in Bahraich themselves are marginalised, with many lacking proper housing and sleeping in the open, making them vulnerable to wildlife attacks. The conflict intensifies when people try to chase away animals with searchlights, crackers or guns,

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Elephant Damaging Crops in Agriculture Field Source: International Union for Conservation of Nature (IUCN)

making them even more aggressive. Climate change and environmental degradation have further disrupted the human and animal relationship, intensifying the conflict even worse. This trend is concerning as it often creates a rift between wildlife and humans furthering the antagonistic relationship, harmful for the coexistence of both.

Why human-animal conflict is a major threat?

For humans, it results in economic losses, injuries, or death, especially in rural communities where livelihoods depend on agriculture and livestock. In the recent wave of wolf attacks Nine children and an adult have been killed by the wolves and at least 34 others have been injured since April-May this year. Such incidents also fuel fear and hostility toward wildlife, which can lead to retaliation, often harming endangered species. As per some reports, around 11 wolves have been killed in retaliation. In the long term, human-wildlife conflict threatens biodiversity and the balance of natural ecosystems, making conservation efforts much more difficult.

Such conflicts in India are not limited to just wolf attacks. Across India, 2853 people have been killed in Humanelephant conflicts in the last 5 years. Whereas 222 elephants were killed by electrocution, trains, poachers, and poisoning between 2018-19 and 2020-21. These numbers rising over the years highlight the need to balance the protection of wildlife while ensuring human safety. As human encroachment into wildlife territories increases, there is a greater need for coexistence strategies. Let's take a look at how the issue is being dealt with in Bahraich.

Bridging the gap

In response to the wave of wolf attacks, the forest department has launched 'Operation Bhedia' to capture the wolves and improve safety in the affected areas. Authorities have also deployed drones and cameras, set traps and used firecrackers to scare away the wolves. Electricity is being ensured in areas without power, and additional security measures such as deploying nets to create a barrier are being implemented at homes where attacks have occurred. This approach ensures the safety of human habitations while minimizing the harm to the wolf population.



Locals patrolling the roads with sticks [Representative Image]

Moving forward, emphasis should also be placed on educating villagers about precautionary measures like keeping children indoors, improving night patrols, and ensuring better supervision of outdoor activities. Complementarily, conservation efforts should focus on habitat restoration and the protection of natural prey for wolves to reduce encounters with humans.

This incident brings attention to the broader challenge of balancing human development with wildlife conservation, underscoring the complexity of finding sustainable solutions for both humans and animals to thrive. Moving from conflict to co-existence, living in harmony with wildlife species while keeping a safe distance is a sustainable solution to address the human-animal conflict.



Human Animal Coexistence is the key! [Representative Image]

Gross Environmental Product Index-Looking Ecology with Economy



Uttarakhand's CM Pushkar Singh Dhami launching the Gross Environmental Product (GEP) Index Source: X

Have you ever wondered how much environmental loss will be there if a patch of forest is cleared for the construction of a Road, Rail line, or any other project? Can you measure this loss in monetary terms? To deal with such issues, Uttarakhand's government has recently launched the Gross Environmental Product (GEP) Index.

New Path for Sustainable Development

Uttarakhand is the first state in the world where the development of the ecosystem will be assessed through the GEP Index. The Chief Minister highlighted that "GEP can also be released along with Gross Domestic Product in the state". He also said that development plans and industrial activities are spreading simultaneously in the state and the GEP Index will help in moving ahead in the direction of climate protection.

Uttarakhand is the first state in the world where the development of the ecosystem will be assessed through the Gross Environmental Product Index.

What is the Gross Environment Product Index?

The GEP Index is a novel method to evaluate ecological development caused by human interventions. There are four pillars of the GEP Index, namely, air, soil, tree, and water. It would increase awareness of the environment. This will help in assessing the contribution to environmental protection. This index will also help in making plans. It will complement the existing Natural Resource Accounting (NRA) mechanism.

GEP index = Air-GEP index + Water-GEP index + Soil-GEP index + Forest-GEP index

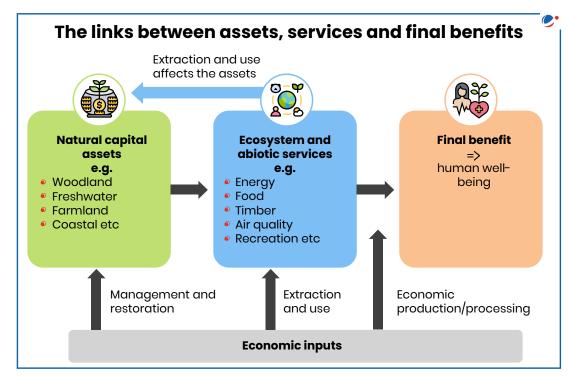
What is Natural Resource Accounting (NRA)?

According to UNEP, NRA is an accounting system that deals with stocks and stock changes of natural assets, comprising biota (produced or wild), subsoil assets (proved reserves), water, and land with their aquatic and terrestrial ecosystems. It is frequently used in the sense of physical accounting as distinguished from monetary accounting. The terms like 'green accounting' and 'environmental accounting' are also used for NRA.

Different countries have adopted different approaches based on their country-specific need as per the united Nation's System of Environmental-Economic Accounting (SEEA), a framework that integrates economic and environmental data to provide a more comprehensive and multipurpose view of the inter-relationships between the economy and the environment. In 2017, the European Union initiated a project, "Natural Capital Accounting and Valuation of Ecosystem Services" (NCAVES) to help nations advance their knowledge on environmentaleconomic accounting. them. It aids policy framing by providing a sound database to help policymakers. Asset and flow accounts have been recognized as a useful framework for monitoring, measuring, and analyzing climate change.

Natural Resource Accounting (NRA) in India

The Government Accounting Standards Advisory Board (GASAB), constituted by the Comptroller and Auditor General of India (C&AG), is hand-holding the States in implementing the NRA. It assists states in preparing the Asset Accounts and helps the State Government



Department build an edifice continuous for data generation the for preparation of the Asset Accounts. NCAVES is also implemented in India with the help of the United Nations Statistics Division (UNSD), United Nations Environment Programme (UNEP), and the Secretariat of the Convention of Biological Diversity (CBD).

Navigating Through Current Environmental Challenges

The launch of the GEP Index by Uttarakhand has set up an example, not only in front of Indian states and Union Territories but also in front of the world. All other

What are the Objectives of the NRA?

The key objective of the NRA is to provide information on the state of natural resources and the changes affecting

states and UTs need to follow the path which has been crafted by Uttarakhand. It will help in creating a balance between economic development and environmental degradation.



Comic Strip Firehawks: Arsonists of the animal kingdom





A study conducted in Australia found that birds like black kites, whistling kites, and brown falcons help spread naturally occurring wildfires, which are common in arid landscapes. For this very reason, they have been referred to by some as 'Arsonists'!

Revamping Disaster Management: The Disaster Management (Amendment) Bill, 2024



Rescue by Indian Army in Jammu and Kashmir during floods. Source: Meta

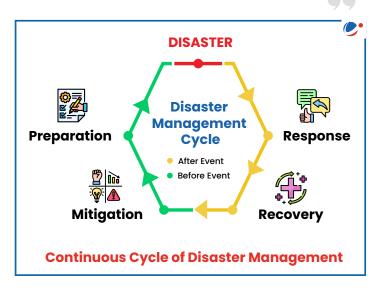
Cyclone Phailin, the most powerful cyclonic storm in almost a decade and a half, made landfall in Odisha on October 12, 2013, with a Category 4 rating. Storm surges of three meters and sustained winds of more than 200 kilometres per hour battered the coastline for hundreds of kilometres. However, given the intensity of the cyclone, fewer than 50 people were killed, which marked a significant decrease from historical figures. It was because Odisha led one of the world's most successful disaster management efforts, evacuating nearly 1 million people ahead of the cyclone. This shows the utmost significance of Disaster Management.

What is Disaster Management?

Disaster management is the process of effectively planning for and responding to disasters. It entails strategically allocating resources to mitigate the damage that disasters can cause. It also entails a strategic approach to manage disaster prevention, preparedness, response, and recovery.

Disasters take many forms. Human-caused disasters are the result of errors or negligence and can include industrial explosions or structural failures. Natural disasters are caused by physical phenomena such as earthquakes and droughts. Disasters, no matter how they manifest, disrupt communities and can have serious consequences for people, property, economies, and the environment.

Disaster management is the process of effectively planning for and responding to disasters. It entails strategically allocating resources to mitigate the damage that disasters can cause.



What is the framework of Disaster Management in India?

Disasters, both man-made and natural, have plagued India for ages. India is among the nations, which is the one of the most vulnerable to natural disasters globally. Ancient Indian literature has mentioned natural disasters such as prolonged droughts, flash floods, hailstorms, landslides, cyclones, earthquakes, and forest fires. India's vulnerability has been growing as a result of unplanned urbanisation, development in high-risk areas, environmental degradation, and climate change.

In 2005, the Government of India enacted the Disaster Management Act, which envisaged the creation of a National Disaster Management Authority (NDMA) headed by the Prime Minister, and State Disaster Management Authorities (SDMAs) headed by respective Chief Ministers. It was enacted to spearhead a holistic and integrated approach to Disaster Management in India.



National Disaster Management Authority (NDMA), headed by the Prime Minister of India, is the apex body for Disaster Management in India. Source: NDMA

What are the key changes brought in the Disaster Management (Amendment) Bill, 2024?

It aligns with the recommendations of the Fifteenth Finance Commission along with the learnings and experiences gained during the implementation of the NDMA Act. It seeks to bring greater clarity and alignment to the roles of various Authorities and Committees operating in the disaster management field. Additionally, the Bill proposes to grant statutory status to pre-existing organizations such as the National Crisis Management Committee and the High-Level Committee. To improve efficiency, the amendment aims to bolster the functioning of both the National Disaster Management Authority and its state-level counterparts. A significant change involves empowering these authorities to prepare disaster plans at national and state levels, a responsibility previously held by the National and State Executive Committees.

The Bill also recognizes the importance of data in disaster management, providing for the creation of disaster databases at both national and state levels. Acknowledging

It aligns with the recommendations of the Fifteenth Finance Commission along with learnings and experiences gained during the implementation of the NDMA Act.

the unique challenges faced by urban areas, the amendment proposes provisions for establishing "Urban Disaster Management Authorities" in state capitals and large cities with Municipal Corporations. Lastly, to enhance state-level disaster response capabilities, it proposes the formation of "State Disaster Response Forces" by state governments. These comprehen sive amendments are designed to streamline processes, clarify responsibilities, and create robust structures for more effective disaster management across India.

What can be the future course of action?

The Bill is in the right direction to improve the overall disaster management in India. It has some issues such as centralisation of power, lack of financial power with urban local bodies as well as restricted definition of 'disaster' as the bill does not expand the list of notified disasters to include climate-induced disasters such as heatwaves. Its success will hinge on overcoming challenges related to coordination, authority, and resource allocation among various levels of the government.



Sustainable Heat: Geothermal Energy as the Future of Clean Power



A geothermal energy plant and Blue Lagoon leisure park in Iceland

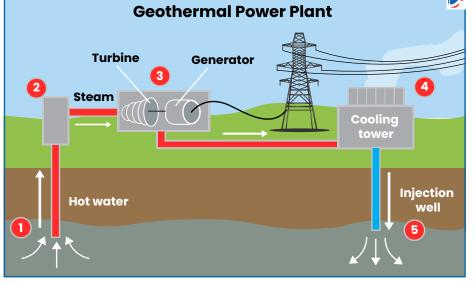
We've all marveled at geysers shooting into the sky or volcanoes erupting with fiery force on television. But what powers these awe-inspiring natural phenomena? The answer lies in geothermal energy. In a noteworthy advancement for India's geothermal energy future, Singareni Collieries Company Limited (SCCL) has recently successfully commissioned a 20 kW pilot geothermal power plant in Bhadradri Kothagudem district, Telangana. Let's dissect the origins of geothermal power. energy is stored in the rock and fluids beneath the Earth's crust from shallow ground to deeper blistering molten rock known as magma. In fact, at these depths, temperatures can soar to an astonishing 6,000°C hotter than the surface of sun itself! Moreover, the amount of heat within 10 km of the earth's surface is estimated to contain 50,000 times more energy than all oil and gas resources worldwide. So how is this energy harnessed?

>>

Earth's Internal Heat Engine: What is Geothermal Energy?

While the concept of geothermal energy may sound modern, it's anything but new. Humans have tapped into Earth's internal heat for centuries, using it for bathing as far back as the Paleolithic era, and for heating spaces since Roman times. Geothermal energy is, quite simply, power harnessed from Earth's internal heat.

Vast majority of Earth's heat is constantly generated by decay of radioactive isotopes, such as potassium-40 and thorium-232. This immense thermal



Where There's Steam, There's Power

To produce geothermal-generated electricity, wells, sometimes a mile deep or more, are drilled into underground reservoirs to tap steam and hot water that drive turbines linked to electricity generators. The first geothermal-generated electricity was produced in Larderello, Italy, in 1904.

Apart from this, geothermal energy is also used to directly heat individual buildings and to heat multiple buildings with district heating systems. Hot water near the earth's surface is piped into buildings for heat. For instance, a district heating system provides heat for most of the buildings in Reykjavik, Iceland.

Geothermal energy potential in India

Geological Survey of India (GSI) has recently estimated that India has a potential of 10,600 MW of geothermal power. India has several geothermal energy sites like Puga and Tattapani. Ministry of New and Renewable Energy is implementing a "Renewable Energy Research and Technology Development

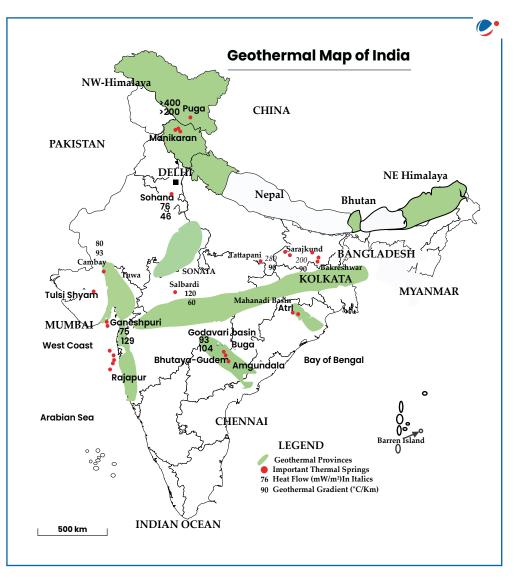
Programme " through various research institutions and industries to develop indigenous technologies and manufacturing for widespread applications of new and renewable energy efficiently and cost-effectively. Moreover, India has signed Memorandum of Understanding with Iceland and identified Geothermal as an area of cooperation.

Geothermal energy is a boundless, clean energy treasure, hidden just beneath our feet, waiting to be tapped. The moment has arrived to accelerate research, foster innovation, and bring cuttingedge solutions to life in order to 'unearth' this vast potential. By harnessing geothermal energy, we can powerfully drive the decarbonization of our heating and electricity systems, making strides toward a more sustainable, energy-secure future.

Weighing the Good and Bad of Geothermal Energy

A great thing about Geothermal energy is that it stands out as a clean, reliable power source, offering several advantages over traditional fossil fuels. Unlike coal, gas, or oil, geothermal energy is harnessed without combustion, making it a much greener option. In fact, geothermal fields emit just one-sixth of carbon dioxide compared to naturalgas-powered plants, while advanced binary plants release virtually no emissions at all.

But like any technology, geothermal energy isn't without its challenges. One of the primary concerns is the release of hydrogen sulfide from the interior of Earth. Additionally, some geothermal fluids can contain trace amounts of toxic materials, raising concerns about safe disposal. While geothermal reservoirs can provide sustainable heat for decades, there's always a possibility that a specific site may eventually cool down. Still, despite these challenges, geothermal energy remains a promising, renewable resource and India has taken many steps to tap this energy.





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Significance of PT 365



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PT 365 is a time and tested document. In the previous years, it has helped lakhs of candidates to cover current affairs in a holistic way. It's impactful features make it easier for aspirants to understand current affairs and excel in the UPSC Civil Services examination.

ENVIRONMENT AND YOU

Life without Microplastic Pollution



By adopting the simple, sustainable habits, individuals can significantly reduce the release of microplastics into the environment. [Representative Image]

As we navigate a world increasingly affected by environmental challenges, the call for individual responsibility has never been more pressing. Our daily choices—what we wear, how we clean, and what we consume—have far-reaching consequences on the health of our planet. Tackling the pervasive issue of plastic pollution demands not only awareness but active participation from each of us. Collective efforts can lead to significant change, making it essential for individuals to adopt sustainable practices in their everyday lives.

Reducing Microplastic in Everyday Life

Do you also want to reduce microplastics from your daily lives? Here are 8 actionable steps to help you make a difference in the fight against microplastic pollution.

Stop using plastic water bottles:

Avoid use of plastic water bottles and switching to other eco-friendly alternatives such as Bamboo bottles, plant-based biodegradable bottles, etc., can contribute in reduction of micro-plastics in daily lives.





Cooking more frequently at 🥑 home:

Preparing meals at home not only reduces plastic waste from food packaging and delivery containers, but it also promotes healthier eating.

Choose Natural fibres over Synthetics:

Clothing made from synthetic materials like polyester, nylon, and acrylic shed microplastics when washed. Opt for natural fibres such as cotton, wool, or linen that do not release plastic fibres into the environment.





Microfiber Filters in Washing Machines:

Install microfiber-catching filters or bags (such as a Guppyfriend bag) to reduce the shedding of microplastics from synthetic clothes. These filters prevent tiny fibres from reaching water systems.

Use Plastic-free personal care products:

Many exfoliants, face scrubs, and toothpaste contain microbeads, a major source of microplastics. Choose products that use natural exfoliants like salt, sugar, or oats instead of plastic microbeads.





Reduce Car tire wear: 🥏

Microplastic pollution from car tires is a significant source of contamination. Maintaining proper tire pressure and choosing public transportation, cycling, or walking can help minimize tire wear and the resulting microplastic pollution.





Proper waste disposal: 🥭

Ensure that plastic waste is disposed of properly by segregating it and sending it for recycling. Improper disposal leads to plastic waste entering natural ecosystems, where it eventually breaks down into microplastics.

Making bulk purchases:

Buying small items packaged in plastic increases your plastic footprint. A more effective way to minimize plastic usage is by purchasing frequently used items in bulk. This approach cuts down on the amount of plastic needed for packaging smaller containers.

Ecotourism and destinations to explore



Let's explore sustainable places. [Representative Image]

Imagine being surrounded by lush greenery, far away from work calls and city noise, the sounds of nature are filling your ears and the smell of forests saturating your lungs. This is the promise of ecotourism, an ethical approach to exploring the world's wonders while minimising our impact on nature. In an age when environmental awareness is more crucial than ever, ecotourism has emerged as a sustainable way to travel and connect with nature. This approach focuses on environmental conservation, education, and supporting local communities. It allows us to enjoy nature's beauty while simultaneously working to preserve it for future generations. Recognising the potential of ecotourism, the Indian government has taken steps to promote it. The Ministry of Tourism, collaborating with the Ministry of Environment, Forest and Climate Change, has developed guidelines for ecotourism in India. These aim to conserve natural resources, respect local cultures, and provide sustainable livelihoods for local communities. Schemes like PRASAD (Pilgrimage Rejuvenation and Spiritual Augmentation Drive) and Swadesh Darshan include eco-friendly tourism development as a key component. Let's explore a few destinations that you can be on your travel bucket list!



Eco Friendly Destinations to explore



Turtuk: Green oasis in Ladakh

A green oasis in the high-altitude desert, Turtuk offers a unique cultural experience. Exemplifies how controlled tourism can preserve cultural heritage in sensitive border areas.

Munsiyari: Uttarakhand's Camping and Trekking Ecstasy

Trekker's paradise with views of Panchachuli peaks, the spot illustrates how adventure tourism can be conducted responsibly in fragile mountain ecosystems.

Khonoma: Nagaland's Green Revolution

It is India's first green village, known for community-conserved forests. It exemplifies the successful integration of traditional practices with modern conservation efforts.

Khangchendzonga National Park: Sikkim's UNESCO Wonder

It is a UNESCO World Heritage site with diverse ecosystems. The National park is vital for biodiversity conservation and promotes sustainable mountain tourism practices.

Majuli: Assam's Floating Wonder

It is the World's biggiiest river island and is pristine and pollution-free and plastic-free condition.



Mawlynnong: The Squeaky-Clean Gem of Meghalaya

It is Asia's cleanest village, with bamboo dustbins and a plastic-free environment. The village showcases how community-led environmental management and sustainable rural tourism can work wonders.

Coorg: Karnataka's Misty Marvel

The city features misty hills and coffee plantations. It highlights the potential of agroforestry in ecotourism, promoting sustainable agriculture alongside forest conservation.



Thenmala: Kerala's Sweet Spot

It is India's first planned ecotourism destination. It demonstrates how tourism can be developed sustainably, balancing conservation with economic benefits for local communities.

Mamallapuram: Tamil Nadu's 'green energy archaeological site

The shore Temple in Mamallapuram is India's first 'green energy archaeological site'. It shows how cultural heritage preservation can be combined with sustainable energy practices.

Daringbadi: Odisha's 'Kashmir'

Surrounded by hills and pine forests, it showcases how lesser-known destinations can benefit from responsible tourism development.

AUGUST						
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reen Days Diary

International Clouded Leopard Day

The day highlights the declining population of the clouded leopard, a vulnerable big cat species, and conservation challenges like habitat loss and poaching.

World Elephant Day

It is a global event aimed at preserving and protecting elephants, focusing on African and Asian species. It raises awareness about threats like habitat loss, ivory poaching, and human-elephant conflict.

World Lion Day

It is an annual event that raises awareness about the conservation status of lions and their challenges in the wild.

World Biofuel Day

It is celebrated annually to promote the use of

Greener Future," emphasizes the potential of

dependence on non-renewable energy sources.

biofuels as alternatives to fossil fuels. The 2024 theme, "Sustainable Biofuels: fuelling a

biofuels to reduce carbon emissions and



WORD OF THE MONTH!

Biomonitoring

Biomonitoring is the process of detecting the presence of chemicals or breakdown products in a person's bodily fluids and tissues. This assists in determining how chemicals reach the human body and their possible health consequences.

THE PLANET PACTS

Stockholm Convention



In the mid-20th century, the widespread use of persistent organic pollutants (POPs) began to raise serious environmental and health concerns. Conscious of the growing danger of POPs, the United Nations Environment Programme (UNEP) Governing Council demanded in 1995 that an international assessment be carried out on an initial list of 12 POPs, often referred to as the "Dirty Dozen". Fast forward to 2001, the Stockholm Convention- a global treaty to protect human health and the environment from POPs- was adopted and entered into force in 2004. Sow what exactly are POPs and what threat do they pose?

Forever Chemicals: POPs

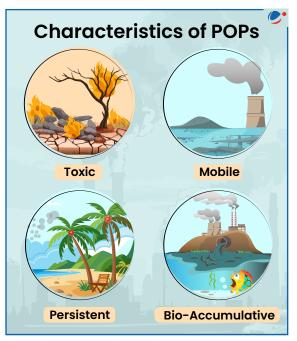
POPs are toxic chemicals that don't easily break down in the environment. Because they last for a long time, they can travel far from where they were used or released, accumulating in the soil, water, and air. What makes POPs especially dangerous is their ability to build up in the tissues of animals and humans, a process known as bioaccumulation, moving through food chains. Over time, they can cause serious health issues like cancer, immune system damage, and developmental problems in both wildlife and humans, even at low levels of exposure.

They include chemicals like DDT, PCBs, and others, which were initially hailed for their effectiveness in agriculture and industry. However, their long-lasting impact on ecosystems and human health soon became apparent. At present, around 30 chemicals are covered under the Stockholm Convention

Ratification and Implementation

The Convention has been 186 parties, including India. India ratified the Stockholm Convention in 2006, demonstrating its commitment to

addressing the global POPs issue. India has developed National Implementation Plan for meeting its obligations under the convention. Further, it has notified the 'Regulation of Persistent Organic Pollutants Rules' in 2018 which prohibited the manufacture, trade, use, import and export of seven chemicals listed as POPs under the Convention.



Quiz Zone

- 1. Which of the following can accelerate the process of plastic breakdown into secondary microplastics?
 - (a) Increased humidity
 - (b) Hydrogen levels in atmosphere
 - (c) Heavy metal contamination
 - (d) Sunlight exposure
- 2. Extended Producer Responsibility (EPR) is based on which principle?
 - (a) Precautionary Principle
 - (b) Polluter Pays Principle
 - (c) Sustainable Development Principle
 - (d) Resource Efficiency Principle
- 3. Who discovered the Great Pacific Garbage Patch (GPGP) in 1997 while sailing back from a yacht race?
 - (a) Sylvia Earle
 - (b) Jacques Cousteau
 - (c) Captain Charles Moore
 - (d) Robert Ballard
- 4. Consider the following pairs of National Parks and Respective States:
 - Protected AreaState1. Kuno National Park (KNP)Madhya Pradesh2. Guru Ghasidas National ParkMaharashtra3. Nagarjunsagar SrisailamAndhra Pradesh

How many of the above pairs are correctly matched?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None
- 5. Identify the bird from the Image:

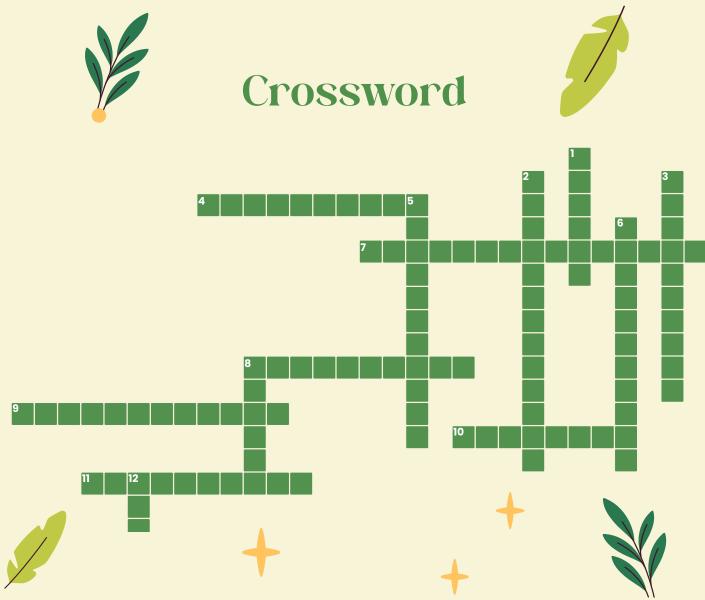


(a) Northern Bald Ibis

- (b) Heron
- (c) Stork
- (d) Spoonbill

- 6. The Kariba Hydropower Dam, which has been in the news, is located in which country?
 - (a) Zambia
 - (b) Tanzania
 - (c) Nigeria
 - (d) South Africa
- 7. Which pioneering Indian state has taken a bold step by launching the Gross Environment Product Index?
 (a) Kerala
 - (b) Sikkim
 - (c) Uttarakhand
 - (d) Punjab
- 8. What generates the vast majority of Earth's heat, which is stored in rocks and fluids beneath the Earth's crust?
 - (a) Earth's rotation around sun
 - (b) Radioactive decay of isotopes
 - (c) Friction from tectonic plate movement
 - (d) Heat from ocean currents
- 9. Which of the following enchanting locations in India is renowned for its geothermal wonders, harnessing the Earth's heat for energy?
 - (a) Tatapani
 - (b) Sonata
 - (c) Puga
 - (d) All of the above
- 10. What is the primary objective of the Stockholm Convention?
 - (a) To promote sustainable development in urban areas
 - (b) To eliminate or restrict the production and use of persistent organic pollutants (POPs)
 - (c) To protect marine biodiversity in international waters
 - (d) To enhance international cooperation on climate change

J. − D, Σ. − B, 3. − C, 4. − B, 5. − A, 6. − A, 7. - C, 8. − B, 9. − D, 10. - B Answers



Across

- 4. Village received the tag of being Asia's cleanest village
- 7. Process by which toxins enter the food web by building up in individual organisms
- 8. Symbiotic relationship between plants and fungi
- 9. Flowering shrub blooming once in 12 years
- 10. Organisms carried along by tides and currents
- 11. Fifth-largest continent

Down

- 1. Part of the earth between the crust and the core
- 2. Process of detecting the presence of chemicals or breakdown products in a person's bodily fluids and tissues
- 3. Frozen water part of the Earth's system
- 5. Materials, woven from synthetic or natural fibers
- 6. Indian state which recently launched the Gross Environmental Product (GEP) Index
- 8. World's biggest river island
- 12. An anti-cancer agent found in Himalayan Yew Tree

Down: 1. Mantle, 2. Biomonitoring, 3. Cryosphere, 5. Geotextiles, 6. Uttarakhand, 8. Majuli, 12. Taxol

ANSWERS Arcross: 4. Mawlynnong, 7. Bioaccumulation, 8. Mycorrhiza, 9. Neelakurinji, 10. Plankton, 11. Antarctica





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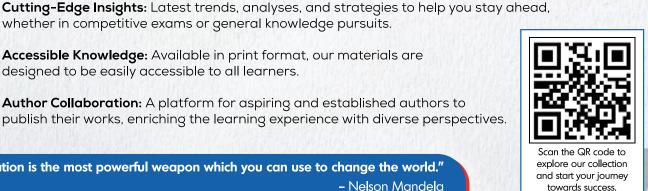


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ABOUT 'THE PLANET VISION'

'The Planet Vision' aims to educate and inspire individuals about the importance of individual actions for a sustainable future. It presents uplifting narratives, highlighting local conservation efforts and community initiatives.

We also provide regular updates on the latest environmental technology and groundbreaking projects, aiming to raise awareness of the environment, nature, and the planet. The goal is to encourage eco-friendly behaviours and promote sustainable practices.

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Ajayvision Education Private Limited, popular under the brand name VisionIAS, is an established leading EdTech company in India. The Infinity Vision, Galaxy Classes, and StudentEdge are several other wings that make up the larger organisation.

Since its incorporation in May 2013, VisionIAS has had a huge impact on the education industry nationwide. VisionIAS creates innovative web-based platforms and mobile apps using AI and ML technologies to give students a unique learning experience.

Moreover, the organization actively engages in CSR initiatives, extending quality education to rural households, thus expanding educational access. **Rajni Devi Global Village School (RDGV School)** and **Paras India** are key parts of this ecosystem.

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