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A DOWN TO EARTH SUPPLEMENT FOR THE YOUNG AND CURIOUS

The Ocean's Blues!

A deep dive into marine pollution—its causes, consequences, and simple solutions that start with you.

Coverstory

Wave of Trash

Dr Ratheesh Raveendran

Explore how plastic, oil, chemicals, and even noise are choking marine life—and what we can do to help.

What is Marine Pollution?

Take a moment to close your eyes and imagine our beautiful blue oceans, full of fishes and marine life, and sparkling clear water. Now, imagine if someone dumped garbage into our beautiful oceans – not just plastics, but sewage waste, oils and chemicals! This atrocity is called 'marine pollution'! Marine pollution means when humans and societies dump their harmful trash into the sea, making it unsafe and unhealthy for both the fishes and humans.

Why is Marine Pollution a Problem?

Marine pollution is a huge problem because it hurts our planet and all its inhabitants, including us!

Firstly, it's extremely dangerous for marine animals. They face dangers from different types of pollutants every single day. Some of them include:

Plastic: Imagine a hungry sea turtle mistaking a floating plastic bag for a yummy jellyfish. When they eat plastic, it fills their stomachs, making them feel full even when they haven't eaten real food, which can make them very sick or even starve to death. Thousands of seals, dolphins, seabirds and whales get tangled in old fishing nets or plastic ropes. These "ghost nets" can tightly wrap around their bodies, making it hard for them to swim, breathe, or find food.

Oil: Many big ships dump their oil into the sea, and it can happen accidently too! But that oil covers birds' feathers and animals' fur, making it impossible for them to fly or stay warm. It also destroys colourful coral reefs which are vital for marine health.

Chemicals: Chemicals from factories or farms are ingested by fish and other tiny sea creatures which makes them very sick, and even makes it hard for animals to have babies.

Too much nutrients (Eutrophication): Sometimes, too much nutrients (like fertilizers) make their way into the ocean which causes phytoplankton (tiny plants) to grow superfast. This, in turn, blocks sunlight and utilise all the oxygen in the water when they decompose. If sunlight doesn't enter the ocean, it can create "dead zones" and it is dangerous for fish and other sea creatures as they can't breathe.

Noise: Very loud sounds from big ships or underwater construction can confuse whales and dolphins who use sound to communicate to each other, find food, and navigate. It's like trying to find your way in a very noisy room!

Secondly, marine pollution dirties our beaches and the scenery. No one wants to play on a beach covered in plastic bottles and wrappers, right? Beyond visible trash, oil spills can leave beaches gooey and unsafe for a long time. This also affects fishermen as pollution can damage their boats and fishing gear, consequently, they cannot catch enough fish.

Thirdly, it can even affect us! When plastic breaks down in the ocean, it becomes tiny pieces called 'microplastics'. These microplastics are eaten by small fish, which are then eaten by bigger fish, and eventually, these bigger fish might end up on our dinner plates! So the harmful plastics make their way into our tummies! We don't want to eat plastics, right?

Finally, it harms the health of our blue planet. Our oceans are incredibly important for the air we breathe and the climate we live in. Marine pollution can disrupt the natural balance of these vital ecosystems. It's like the ocean's cry for help saying, "Help, I'm sick!"

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Where Does Marine Pollution Come From?

A total of 80 per cent of ocean pollution, especially plastic, comes from land-based sources. This means it comes from our streets, our homes, and our communities!

Think about it.

Littering: When someone throws a plastic wrapper, an old battery, or other trash on the road instead of in a dustbin, it can be blown by the wind or washed by rain into the drains, rivers, and eventually, the sea.

Poor waste management: In many places, including several parts of India, waste is not collected or disposed of properly. Sometimes open dumps or overflowing bins can cause plastics to wash into the oceans.

Coverstory

Popular tourist spots generate a lot of waste and sometimes untreated sewage, and if not managed well, it ends up on beaches and in the sea, adding both visible trash and invisible pollutants.

Runoff from land: Rain washes fertilizers and pesticides from farms, which then pollute the sea. Even everyday things like soap from washing cars are eventually harming the oceans. Industrial activities: Factories release toxic wastewater directly or indirectly into rivers and coasts.

Coastal tourism and sewage: Popular tourist spots generate a lot of waste and sometimes untreated sewage, and if not managed well, it ends up on beaches and in the sea, adding both visible trash and invisible pollutants.

Loud activities: Near the coasts, things like dredging (digging up the seabed), building new ports, or even loud boat engines can create noise pollution that travels far underwater.

So, now we know that even the plastics from Delhi to the runoff from coasts in Cochin, have a direct impact on the health of our oceans far away. Every piece of plastic we use and throw away, every drop of chemical that washes into a drain, has a journey, and we need to make sure this journey ends safely, not in the ocean!

How Can Marine Pollution Be Tackled?

The good news is that we can all work together to solve it! With teamwork from governments, communities, and every one of us, we can save our oceans!

Government Schemes: Governments around the world, including India, are stepping up. India's 'Swachh Bharat Abhiyan' (Clean India Mission) works to improve waste management across the country, so it doesn't end up in waterbodies. There are also new rules drafted to ban certain single-use plastics, like plastic bags and straws, in many states. Governments are also working to treat wastewater before it reaches the ocean, and make stricter laws to control industrial pollution.

know what can be recycled in your area.
- Never throw anything harmful down the drains or into rivers – even small amounts of soap or oil can be dangerous!
- Spread the word! Tell your friends and family about why it's important to keep our oceans clean and healthy in every way.

Conclusion

Every single action, no matter how small, can make a difference! When you choose a reusable water bottle instead of a plastic one, you're sending a big message: "I care about our planet!"

Now, let us close our eyes and imagine once again, an ocean free of plastic and harmful substances, where turtles swim happily without mistaking bags for food, coral reefs are vibrant and healthy, and beaches sparkle clean and safe for everyone to enjoy. This future is possible if we all work together!

Let's make smart choices and inspire others to do the same! Together, we can create a cleaner, healthier blue planet for everyone.

Our Community Measures: It is not just governments who are making efforts, but local communities are also stepping up! Many towns and villages organize beach clean-ups regularly, where volunteers pick up trash by the beach. Schools are educating students about recycling, reducing waste, and raising awareness about pollution sources. For example, many schools in India now have separate bins for different types of waste.

But more importantly, what can YOU do to help clean the oceans?

Your contribution matters! Little, conscious efforts can go a LONG way in preserving marine ecosystem.

What YOU Can Do: The most important step is for you to reduce your "irrational and unwanted plastic use" and be mindful of other pollutants. That means:

- Say "no" to plastic straws and cutleries and use reusable ones.
- Carry a reusable water bottle instead of buying new plastic ones.
- Use cloth bags for shopping instead of plastic bags.
- Think before you buy: "Do I really need this, or is there a plastic-free or less polluting option?"
- Dispose properly, always make use of waste bins,

Additionally, governments are also working to treat wastewater before it reaches the ocean, and make stricter laws to control industrial pollution.

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Readers Writers

Plastic Pirates of Kochi

Meet the students turning kayaking into a weekly mission to collect plastic waste and keep the backwaters clean — one paddle at a time.

Reny Daniel

Tushita Rawat

We have all heard it before: Learning-by-doing is the best way to foster positive action in students. But seeing the approach in action always leaves us inspired and motivated.

A school in Kochi, Kerala — SBOA Public Senior Secondary School — has struck the perfect balance between learning and fun through their unique initiative — a kayaking club that combats marine litter! Every week, school students and teachers, under the guidance of trained professionals, kayak through the backwaters behind the school, collecting plastic waste along the way.

The novel idea was proposed by Fr Rex Joseph Arakkaparambil, fondly known as the Kayaking Priest of Asia, who is also associated with Cochin Paddle Club. His suggestion to use kayaking as a way to clean water bodies was met with enthusiasm by a group of committed educators and young environmentalists at the school. Their first venture out on kayaks led to successful collection of plastic waste — and thus began the school's remarkable journey of environmental stewardship on water.

From there on, the initiative grew in leaps and bounds. The school started creating awareness about marine litter and plastic pollution among students and the rest of the community. Sessions were organised to help them understand sources and impacts of plastic pollution. The school also organised visits to the Central Marine Fisheries Research Institute (CMFRI) to help students understand marine biodiversity and its importance better. Students learned how plastic waste in water bodies is mistaken for food and ingested by fish, turtles and other aquatic creatures. This leads to injuries and death. But the damage doesn't stop there — the waste further breaks down into microplastics and enters the food chain, making its way to our plates.

The school joined hands with Cochin Paddle Club to strengthen their efforts. Teams of students and teachers, armed with nets and sticks, compete to collect and fill their nets with plastic waste from the backwaters.

The excitement and dedication of students led the school management to form an official kayaking club of the school and invest in 12 kayaks! Now, in partnership with Scuba Cochin, students receive professional kayaking training and set out every Friday morning for 1.5 hours to collect plastic waste from the backwaters. The collected plastic waste is handed over to Haritha Karma Sena, who take it to shredding units for proper segregation and recycling.

This initiative is a powerful example of the role of the youth in environmental action. Kayaking not only offers a fun and healthy experience to students but also provides a purpose to paddle forward and keep fighting the plastic pollution.

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Readers Writers

How Climate Crisis Hits India & the World

Shephali Sachan

Explore how climate change is impacting India's biodiversity, agriculture, and daily lives—mirroring a global crisis that demands urgent action

The Intergovernmental Panel on Climate Change (IPCC), 2001 and 2004 report said that the atmospheric carbon dioxide (CO_2) concentration has risen from 280 ppm (parts per million) in pre-industrial periods to about 390 ppm today. It also records the escalation in global surface temperature range from 1.1°C to 6.4°C. The Earth has become much warmer since the Industrial Revolution.

The Fourth Assessment Report of the IPCC 2014, has revealed long term effects of climate change primarily due to GHGs emissions like CO_2, methane, and nitrous oxide. Deforestation, shifting cultivation, water pollution, and mining and industrialization are worsening the situation. So, is global warming for real? Yes! Some of its consequences are as follows.

- **Volatile abiotic stresses in plants** have left only 3.5 per cent of the global land area unaffected. Abiotic stresses are environmental factors that can affect a plant's development through heat, cold, drought, salinity, heavy metals toxicity, etc.
- Abiotic stress has **reduced crop production** by nearly 70 per cent.
- Rising annual temperatures have **reduced crop production area** in sub-Saharan Africa, Caribbean, India, and northern Australia.
- Since 1997, about 10 million ha has been affected due to drought and caused **death of many tree species.**
- Saline soil covers around 1 billion ha worldwide with about 82.3 million ha in South Asia alone. Hence, total cultivable land will plummet 50 per cent if **soil salinity** continues.

Let's analyze the picture close home, in India:

- **Rapid deforestation in the Himalayas** is threatening the Indo-Gangetic belt with floods and droughts.
- About 1/5th of India's total area is exposed to frequent **floods**. The Gangetic Plains, Brahmaputra Valley, Eastern Coastal plain and western Rajasthan (Indira Gandhi Canal command area) are under strong pressure of **waterlogging.**
- Kolkata and Mumbai are 'potential major hotspots' for flooding and **sea-level rise.**
- A total of 142 districts across Gujarat, Rajasthan, Punjab, Haryana, Uttar Pradesh, Karnataka, Andhra Pradesh, and Tamil Nadu are affected by **soil salinity.**
- About 32 per cent of the total land, or about 2/3rd of the agricultural land, in India is **drought**-affected.
- The 2013 Uttarakhand floods and **landslides,** the 2015 Chennai flood, and the 2016 drought conditions are direct impacts of climate change.
- There are visible **vegetation-shift patterns** in the North-East, Himachal and Western Ghats, along with declining biodiversity.
- The yak, house sparrow, Indian bustard, Red Panda, Nilgiri Tahr, Red Sandalwood, Musli, Malabar mahogany, Ebony, etc., are now **endangered species.**

Although these events might sound dismal but we can mitigate global warming by taking accountability and implementing strict laws.

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hotmess presents

CRIMINAL PLASTIC

India is full of amazing animals and forests—but plastic is spoiling the party! According to *Down to Earth*, published by Centre for Science and Environment, we dump 9.3 million tonnes of plastic every year—more than any other country! This amounts to roughly one-fifth of global plastic emissions. This badly pollutes the air we breathe as most of the plastic garbage is burnt. Our growing love for single-use stuff is making things worse. Can we stop the plastic monster before it grows bigger?

Ritika Bohra/GT