

Plastic Peril: Threatening to Marine Life

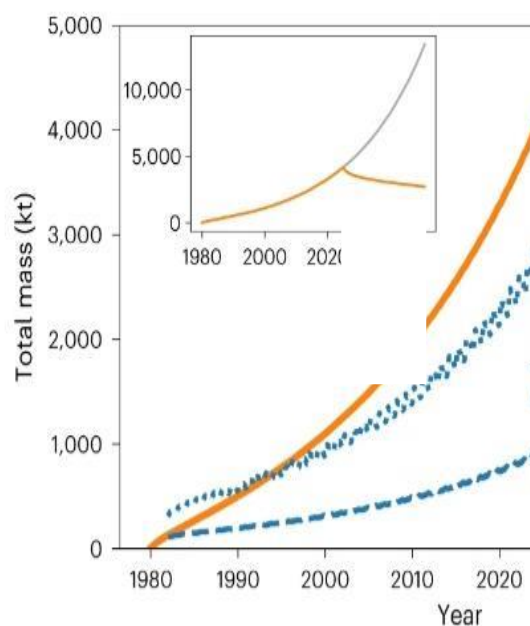
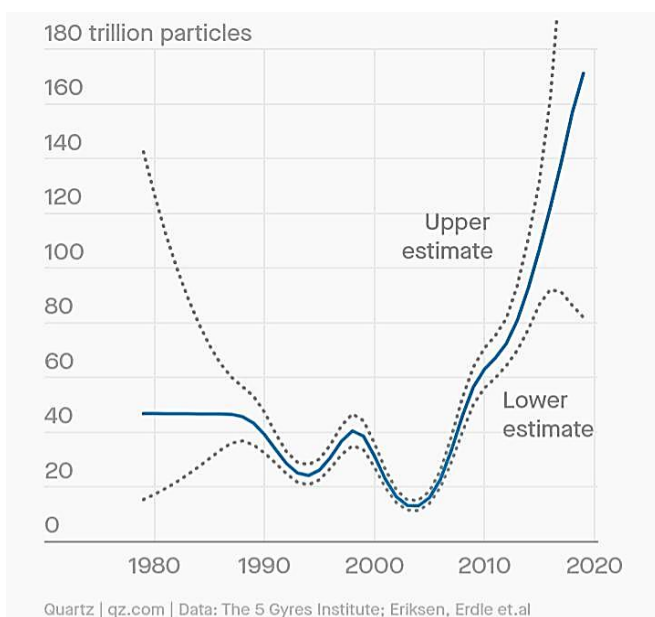
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Abstract

Plastic, due to its affordability and convenience, has permeated every aspect of our daily lives. Unfortunately, our careless handling of this material has transformed it into a paramount environmental crisis during our lifetime. Annually, millions of tons of plastic waste are discarded, with a significant portion finding its way into the oceans, inflicting harm upon wildlife and ecosystems. Astonishingly, a mere 9% of all plastic ever produced is recycled. The world generates a staggering 400 million tonnes of plastic waste, with the United States leading the pack, producing 42 million metric tons annually. Over 8 million tonnes of plastic end up in our oceans each year, causing the death of approximately 100,000 animals entangled in ghost fishing nets. Human exposure to plastic reaches an alarming 5 grams per week. During the COVID-19 pandemic, an additional 25,900 tonnes of plastic pollution found its way into the ocean, largely due to the essential nature of single-use surgical face masks, Personal Protective Equipment (PPE), and plastic disinfectant bottles.



Plastic pollution on marine life is a significant threat to many marine species and their life. In this we discover the sources and types of plastic in oceans and their impact on marine life, marine flora and marine habitats, and the economic and social effects of plastic pollution and suggest steps for to reduce plastic pollution and save our oceans.

The most types of plastic pollution are microplastics. They are small particles that are less than 5mm in size. Microplastics have diverse sources, including agricultural products, cosmetics, and industrial waste. When they find their way into the ocean, they pose significant threats to marine life. They can be ingested by plankton and other small sea creatures, entering the marine food chain.

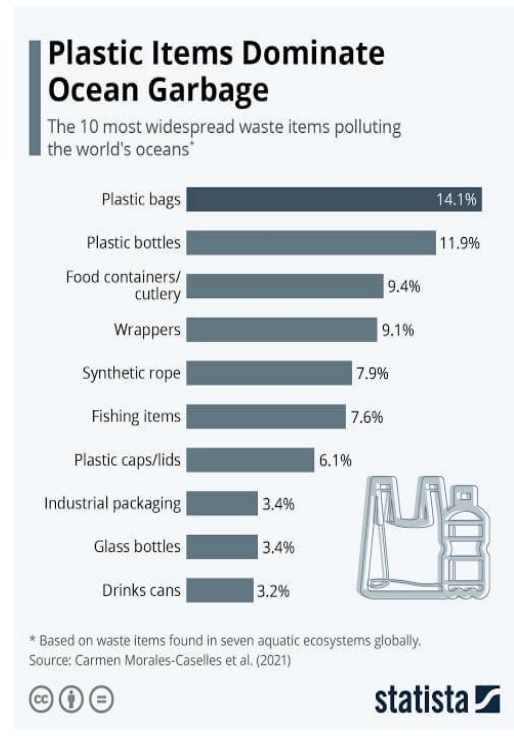
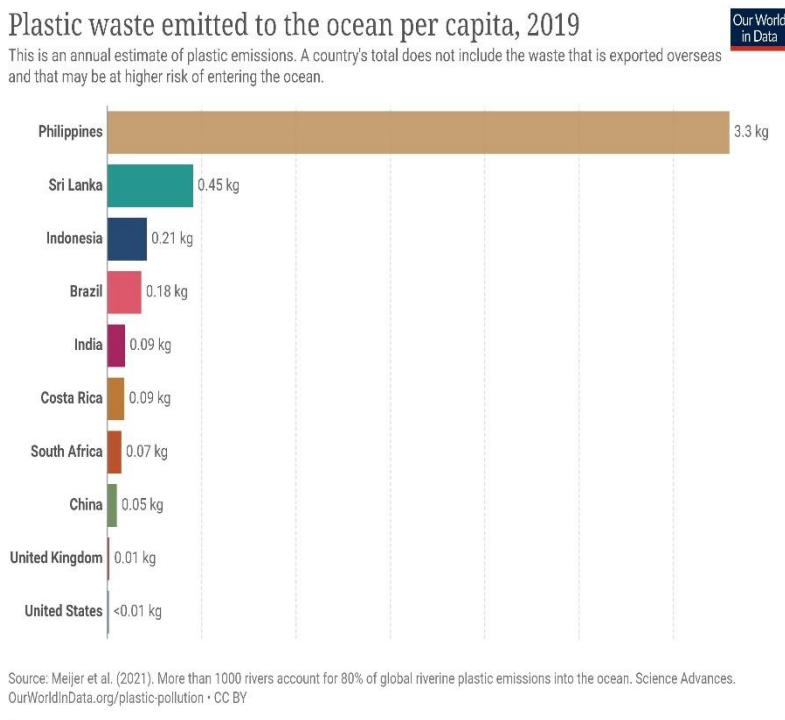


Fig 2 - Plastic waste Emmitt in Ocean per capita, 2019

Fig 3 – Plastic dominates ocean garbage

The ingestion of larger plastic pieces or entanglement in plastic can lead to asphyxiation or poisoning from toxic chemicals, which can have cascading effects on marine ecosystems. Addressing the sources and impacts of microplastics is crucial for the health of our oceans and the species that inhabit them.

Microplastics can enter the environment through various means, including the breakdown of larger plastic items due to sunlight and other factors. These tiny plastic particles can indeed have harmful effects on ecosystems, plant life, and wildlife when they accumulate in the environment. It's crucial to address this issue to protect our planet's ecosystems and biodiversity



Plastic pollution is indeed a complex issue, but individual actions can make a difference. By adopting habits like using reusable bags, reducing plastic bottle usage, and avoiding littering, we can collectively work towards reducing the impact of plastic pollution on our environment. It's essential for individuals, communities, and industries to take steps in the right direction to tackle this global problem.

Sources of Plastic in Oceans

The various ways plastic waste finds its way into our oceans. Some of the major sources include improper waste disposal, industrial runoff, and plastic debris from fishing and shipping activities. To combat this issue, it's crucial to raise awareness, implement proper waste management systems, and promote sustainable practices to reduce plastic pollution in our oceans.

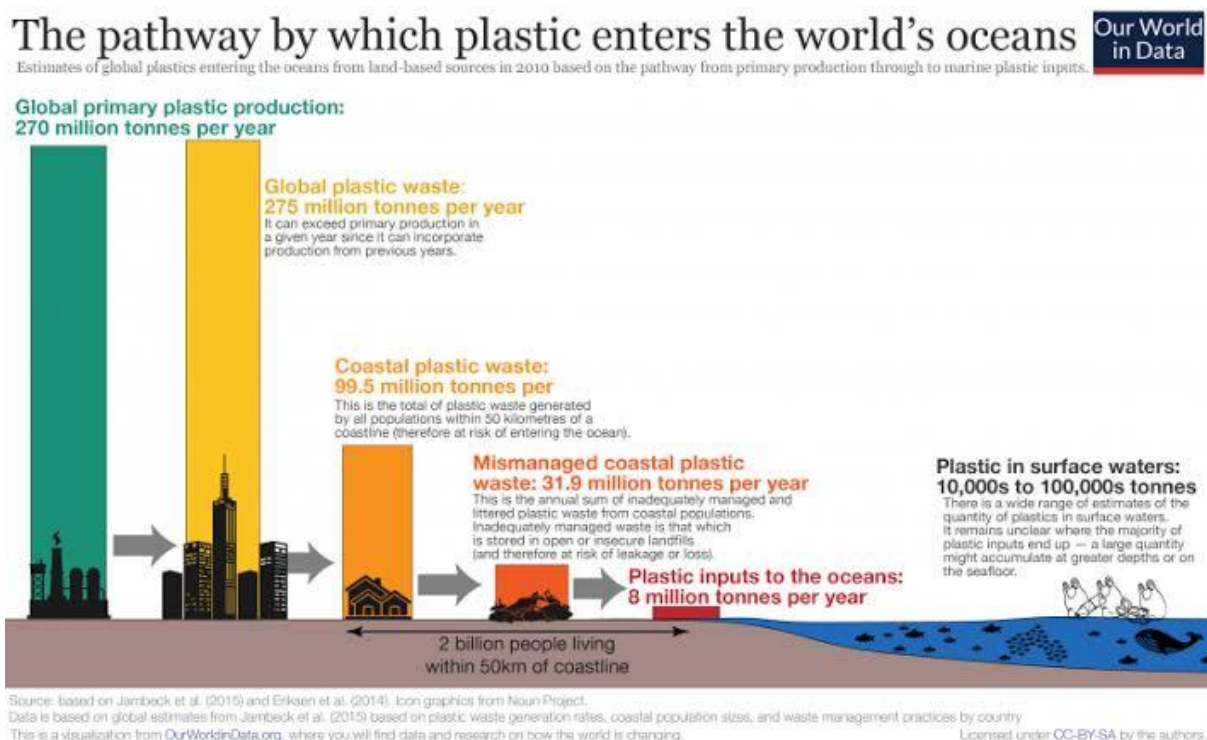


Fig 4 – Pathway by which plastic enter world ocean

Ghost nets and fishing gear: Ghost nets are abandoned, lost, or discarded fishing nets and gear that continue to float in the ocean and pose a serious threat to marine life and ecosystems. These nets can entangle and trap fish, marine mammals, seabirds, and other aquatic organisms, leading to injury or death. They damage also coral reefs and other habitats.

Addressing ghost nets and abandoned fishing gear is crucial for the health of our oceans and the preservation of marine ecosystems.

Land-based sources: Land-based sources of plastic waste are a major contributor to marine pollution. This includes plastic debris and microplastics that originate from various human activities on land, such as improper disposal of plastic waste, industrial processes, and even

microplastics from personal care products like exfoliating scrubs. These pollutants can enter rivers, lakes, and eventually flow into the oceans, posing serious environmental and ecological threats. Efforts to reduce and properly manage plastic waste on land are crucial to mitigate this issue.

Marine transport: Marine transport can indeed contribute to pollution, especially through container spills and ships' waste. This pollution can lead to some areas having more ocean trash than fish, which poses significant environmental challenges. Efforts to reduce such pollution and promote sustainable shipping practices are essential to protect our oceans and marine ecosystems.

Changing Ecosystems:

How Plastic Pollution Alters the Marine Environment

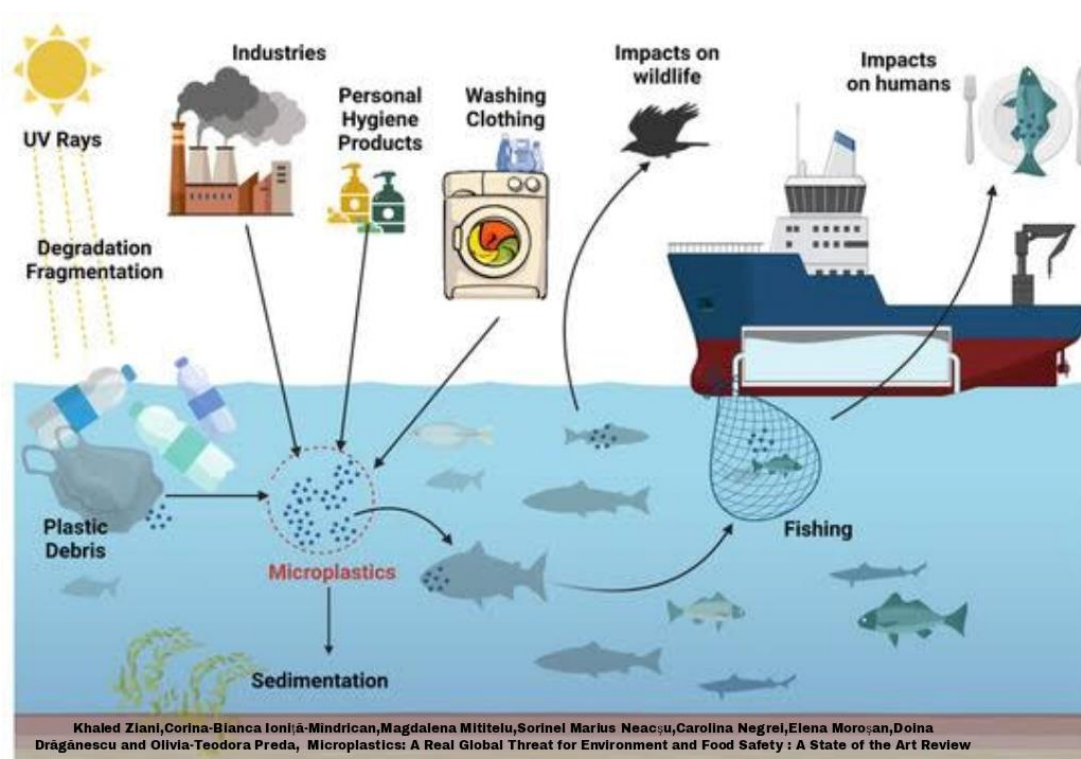


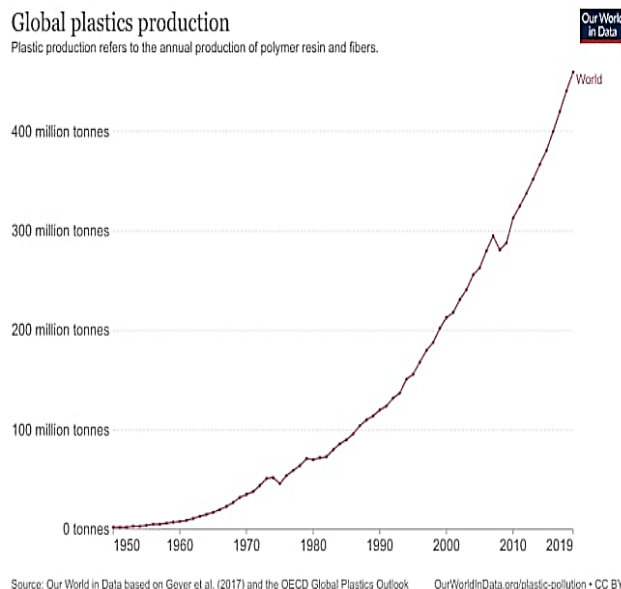
Fig 5 - Plastic Enter in marine ecosystems

Marine food chain: Plastic pollution in the ocean can be mistaken for food by marine organisms like phytoplankton, zooplankton, and fish. When these plastics are ingested, they can accumulate toxins and harm the health of these creatures. This can, in turn, affect the entire marine food chain and potentially impact human health when we consume contaminated seafood. It highlights the importance of addressing plastic pollution and its environmental consequences.

Beach inundation: Beach inundation by plastic debris is indeed a serious environmental issue. It not only affects the aesthetic beauty of beaches but also poses significant threats to wildlife, including sea turtles and horseshoe crabs. Plastic pollution can obstruct the path of turtle hatchlings

to the sea, reducing their chances of survival. Additionally, it disrupts the natural ecosystem and can have far-reaching consequences on marine life and coastal environments. Addressing plastic pollution is crucial for preserving these delicate ecosystems.

Microbial activity: Microbial activity in the ocean plays a vital role in breaking down organic matter and maintaining ecological balance. When plastic waste enters the ocean and leaches toxic chemicals, it can harm these microorganisms, disrupting their ability to perform their essential functions. This disruption can have cascading effects throughout the marine food chain and ecosystem, ultimately impacting the health of the oceans and the species that depend on them. Reducing plastic pollution is essential to mitigate these harmful effects on microbial life and marine ecosystems.



Plastic Pollution Is Growing

Total annual output of mismanaged plastic waste by coastal populations, top-ranked countries by billions of pounds

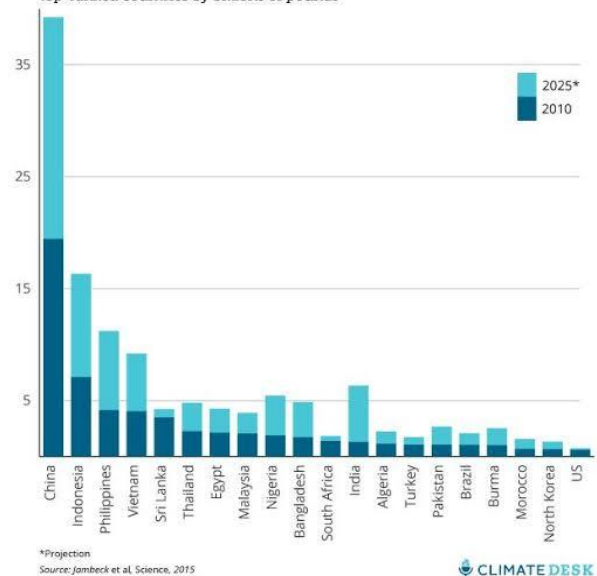


Fig.6 – Global plastic production

Fig 7 – Plastic pollution growing

What We Can Do to Reduce Plastic Pollution in Oceans

Reducing sea plastic pollution requires a multi-faceted approach:

- **Reduce Single-Use Plastics:** Minimize the use of single-use plastics like plastic bags, straws, and bottles. Opt for reusable alternatives.
- **Recycle Properly:** Ensure proper disposal and recycling of plastics.
- **Clean-Up Initiatives:** Support or participate in beach clean-up events to remove existing plastic debris from coastal areas.



- Prevent Littering: Educate and promote responsible waste disposal. Discourage littering and report illegal dumping.
- Plastic Alternatives: Advocate for and use alternatives to plastics, such as biodegradable or compostable materials.
- Support Legislation: Advocate for policies and regulations that reduce plastic production and encourage sustainable alternatives.
- Consumer Choices: Choose products with minimal plastic packaging and support businesses that prioritize sustainability.
- Raise Awareness: Educate yourself and others about the impact of plastic pollution on marine life and ecosystems.
- Innovation: Support research and innovation for new technologies to clean up plastics from oceans.
- Reduce Microplastics: Avoid personal care products with microbeads and support efforts to reduce microplastic pollution.
- Community Involvement: Get involved in local environmental groups and initiatives focused on plastic pollution.
- International Collaboration: Promote international cooperation to address the global issue of plastic pollution.
- Remember, reducing sea plastic pollution is a collective effort that involves individuals, communities, businesses, and governments working together to make a positive impact.

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