

## Open Schools Journal for Open Science

Vol 8, No 2 (2025)

Vol. 8 No. 2 (2025): Open Schools Journal for Open Science - Special Issue -IDEA Conference Proceedings



### PLASTIC POLLUTION AND ITS ALTERNATIVES

*Antonis Lignos, Nikitas Karavasiliadis*

doi: [10.12681/osj.43791](https://doi.org/10.12681/osj.43791)

Copyright © 2025, Antonis Lignos, Nikitas Karavasiliadis



This work is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0](https://creativecommons.org/licenses/by-nc-sa/4.0/).

#### To cite this article:

Lignos, A., & Karavasiliadis, N. (2025). PLASTIC POLLUTION AND ITS ALTERNATIVES. *Open Schools Journal for Open Science*, 8(2). <https://doi.org/10.12681/osj.43791>

# PLASTIC POLLUTION AND ITS ALTERNATIVES

Lignos Antonis, Nikitas Karavasiliadis

## Abstract

Plastic pollution has become a global environmental crisis. Each year, millions of metric tons of plastic enter the ocean, threatening marine ecosystems and human health. Plastic, being non-biodegradable, accumulates and breaks down into harmful microplastics and nanoplastics. These particles contaminate ecosystems and food chains. This presentation explores the scale and effects of plastic pollution, and it examines sustainable alternatives such as bamboo, paper, and glass. Furthermore, the economic benefits of transitioning away from plastic are also discussed.

**Keywords:** Plastic pollution, microplastics, sustainable alternatives, ocean ecosystems, environmental impact

## 1. Introduction

Plastic has been a revolutionary material due to its versatility and low cost. However, its widespread use and poor disposal practices have created an environmental disaster. Our research aimed to highlight the scope of plastic pollution and the urgent need to adopt sustainable alternatives. We gathered our data from scientific and environmental reports, and we aim to educate others on how individual and collective actions can make a difference.

## 2. Structure

- Facts about plastic
- The power of plastic
- The effects of plastic
- Ways to tackle the issue
- Importance of alternatives
- Economic impact
- Conclusion

## 3. Facts About Plastic

Plastic pollution in our oceans has reached alarming levels, with approximately 11 million metric tons entering marine environments each year, adding to the estimated 200 million metric tons already present. If current production and waste trends continue, plastic is projected to outweigh fish in the ocean by mid-century. This pollution includes a wide range of materials, from synthetic fishing nets to single-use items like bottles and bags. The scale of the problem is staggering—collected ocean plastic could fill around 5 million shipping

containers, and if lined up, they would stretch 30,000 kilometers, roughly the distance from New York to Sydney.

#### 4. The Power of Plastic

Plastic does **not biodegrade**. Instead, it breaks down into **microplastics** and **nanoplastics**. These tiny fragments persist in the environment for centuries, creating long-lasting pollution.

#### 5. The Effects of Plastic

**Microplastics** act like sponges for toxins, posing serious health risks to both humans and wildlife. These particles have been found **everywhere**, from common clothing and laundry to **Mount Everest** and the **deepest parts of the ocean**. Exposure to some plastics has been linked to **cancer** and other health issues. Marine life is particularly vulnerable, with entire ecosystems being disrupted by plastic contamination.

#### 6. Ways to Tackle the Issue

Solutions involve reducing plastic use and switching to eco-friendly materials:

- **Bamboo**: renewable and sustainable
- **Paper**: biodegradable and widely available
- **Glass**: reusable and recyclable

#### 7. Economic Impact

Undoubtedly, the economic impact of alternatives is significant. Transitioning from plastics can **create up to 700,000 new jobs** by 2040. Innovation in sustainable materials supports livelihoods, particularly in **developing countries**. The shift away from plastic opens opportunities in green technology and circular economies.

#### 8. Conclusion

The plastic pollution crisis is driven by excessive use and ineffective waste management. Plastics pollute land, oceans, and food chains, contributing to **climate change** and **biodiversity loss**. By adopting biodegradable materials and efficient recycling practices, we can reduce pollution and protect future generations.

#### References

1. <https://www.unep.org/plastic-pollution>

2. <https://iucn.org/resources/issues-brief/plastic-pollution>
3. <https://www.genevaenvironmentnetwork.org/resources/updates/plastics-and-health/>
4. [https://unfoundation.org/blog/post/protect-our-planet-from-plastic-pollution-5-things-to-know/?utm\\_source=chatgpt.com](https://unfoundation.org/blog/post/protect-our-planet-from-plastic-pollution-5-things-to-know/?utm_source=chatgpt.com)