



IMPACT OF COVID-19 ON THE ENVIRONMENTAL SUSTAINABILITY

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ABSTRACT

The COVID-19 pandemic, primarily categorized as the global health and economic crisis, simultaneously functioned as a significant though largely inadvertent global experiment in environmental sustainability. This study examines the dual nature of its impact, distinguishing between short-term restorative effects and long-term systemic challenges. Initially, the "anthrop use"-a dramatic reduction in human mobility and industrial activity-led to measurable improvements in air quality, with global nitrogen oxide and carbon oxide gas emission falling by up to 30% and 6.4% respectively, in 2020. Concurrently, reduced industrial effluent resulted in the revitalization of key aquatic ecosystem, such as the Ganga and Yamuna rivers in India.

However, these gains were largely temporary and countered by significant negative externalities. The pandemic catalyzed a surge in bio hazardous and plastic waste, with an estimated 129 billion face masks and 65 billion gloves used monthly in 2020. Much of which was disposed of improperly. Furthermore. The economic slowdown diverted resources from climatic mitigation and potentially accelerated deforestation in critical regions like Amazon. Looking towards 2026, the pandemic's, lasting legacy is a shift in sustainability paradigms, moving from moral appeals to "operating systems" centered on resilience packages. This review of the article focuses that while pandemic offered a 'window of opportunity' for environmental rejuvenation, long-term sustainability requires a structural transformation of economic and behavioral system rather than temporary halts in activity.

KEY WORDS: COVID-19, Environmental Sustainability, Anthropause, Green Recovery, Waste Management, Climate Action.

INTRODUCTION

The COVID-19 pandemic, declared a global health emergency in early 2020, stands as one of the most significant disruptions to human activity in modern history. Beyond its devastating health and economic tolls, the pandemic triggered a complex, dual-track impact on environmental sustainability. On one hand, the "anthropause"—the sudden, widespread cessation of industrial and transport activities—offered a rare; real-world experiment that temporarily lowered the planet's ecological burden. On the other hand, the medical response and shifting consumer behaviors introduced new, persistent environmental challenges that have reshaped global sustainability strategies through 2026.

The immediate environmental effects were largely restorative. Lockdown across 188 countries led to an unprecedented drop of carbon dioxide emission and reduced nitrogen oxide level. This reprieve allowed urban air quality to reach standards not seen in decades and permitted several major



aquatic ecosystems to undergo rapid self-cleansing. For instance, levels of suspended particulate matter in India's longest lake dropped by roughly 16% during early lockdowns, while the absence of tourists led to significantly clearer waters in Venice.

However, as the world moved past the initial crisis, it became evident that these gains were temporary and potentially eclipsed by a new "plastic pandemic." The mass production and disposal of face masks and gloves monthly created a surge in non-biodegradable waste, much of which entered marine and terrestrial habitats. Furthermore, by 2026, many of the initial emission reductions have reversed, with global carbon emissions hitting record highs in 2024 despite the accelerating shift toward clean energy.

Today, the legacy of COVID-19 on environmental sustainability is defined by a shift from "moral appeals" to "execution." The pandemic highlighted the interconnectedness of human and planetary health, leading to the rise of "Green Recovery" models, such as the European Union's €1.7 trillion budget proposal, which reserves 25% for climate-friendly initiatives. This body of work explores the multifaceted impacts of the pandemic, analyzing how it both stalled and accelerated progress toward the United Nations' Sustainable Development Goals (SDGs) and established the bedrock for the resilience-focused environmental policies of 2026.

POSITIVE IMPACTS ON ENVIRONMENTAL SUSTAINABILITY:

- **Accelerated Energy Transition:** The pandemic spurred a strategic shift toward renewable energy. By 2025, India achieved its COP26 goal of **50% non-fossil fuel power capacity** five years early, reaching **223.6 GW** by June 2025.
- **Atmospheric & Water Rejuvenation (Anthropause):** During lockdowns, nitrogen dioxide (NO₂) levels fell by up to **71%** in major cities. The Ganges and Yamuna rivers saw **40-50% improvements** in water quality, meeting bathing standards for the first time in decades.
- **Green Policy Momentum:** Major initiatives launched or expanded post-pandemic include:
 - **PM Surya Ghar Muft Bijli Yojana:** Aiming to provide rooftop solar to **10 million** households by 2026.
 - **Swachh Bharat Mission 2.0:** Targeting 100% scientific municipal solid waste management and "Garbage Free Cities" by 2026.
 - **Green Hydrogen Mission:** Aiming to produce 5 million metric tons annually by 2030, positioning India as a global clean fuel hub.
- **Ecological Resilience:** India's carbon sink reached **30.43 billion tonnes** of CO₂ equivalent in late 2024, showing steady progress toward 2030 reforestation targets.

NEGATIVE IMPACT ON THE ENVIRONMENTAL SUSTAINABILITY:

- **The "Plastic Pandemic":** The surge in single-use plastics from PPE and e-commerce packaging remains a critical waste management challenge. In 2025, India generated roughly **41.4 lakh tonnes** of plastic waste.
- **Biomedical Waste Surge:** Pandemic-related waste increased **15 times** in some areas, overwhelming the country's Common Bio-Medical Waste Treatment Facilities (CBMWTF), which operated at **70-90% capacity** during peak periods.
- **Emissions Rebound:** Despite the 2020 dip, India's fossil fuel CO₂ emissions reached an all-time high of approximately **3.22 billion tonnes** in 2025, driven by rapid industrial recovery.
- **Indirect Deforestation & Poaching:** Reduced surveillance during lockdown led to localized increases in illegal timber felling and wildlife poaching, particularly in areas dependent on tourism-based conservation revenue.

WASTE MANAGEMENT CHALLENGES (2025):

The "plastic pandemic" remains a critical issue in 2025 as the country manages post-pandemic waste legacies:

- **Plastic Waste:** India's plastic waste generation reached **41.4 lakh tonnes** in the 2024-25 cycle.
- **Medical Waste Legacy:** The pandemic-induced surge in biomedical waste pushed India's limited treatment facilities to their limits, with nearly **70-90%** of capacity utilized in states like Delhi and Kerala.

CONCLUSION:

The temporary "anthropause" of 2020 proved that immediate ecological recovery is possible through the reduction of fossil fuel consumption and human mobility. However, the subsequent record-high emissions and the persistence of the "plastic pandemic" underscore that temporary pauses are insufficient. True environmental sustainability cannot be achieved through crisis-induced halts, but only through the deliberate, structural transitions currently underway—such as India's achievement of 50% non-fossil fuel capacity and the global shift toward green hydrogen.

Ultimately, the COVID-19 pandemic reshaped the global environmental narrative. It moved sustainability from a peripheral concern to a central pillar of national security and economic recovery. The lesson of the pandemic is clear: while nature can heal itself if given space, maintaining that health requires a permanent decoupling of economic growth from environmental degradation. The path forward lies in the "green recovery" strategies initiated in the wake of the crisis, ensuring that the clear skies of 2020 become a permanent reality rather than a historical anomaly.

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